SEPTEMBER 2-5, 2020
BUDVA, MONTENEGRO

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LIFE SCIENCE AND TECHNOLOGY

ICONST LST 2020

International Conferences on Science and Technology

Life Science and Technology (LST)

September 2-5 in Budva, MONTENEGRO

ABSTRACTS
&
PROCEEDINGS BOOK

ICONST LST 2020

International Conferences on Science and Technology

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Published by

Association of Kutbilge Academicians, Isparta, Turkey
E-Mail: kutbilgescience@gmail.com

Publication Date: 20/10/2020
ISBN: 978-605-68864-8-5

ICONST LST 2020

International Conferences on Science and Technology

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Effects of age on the Histomorphological Characteristics of Testes of Bull in the Eastern of Algeria

Belkhiri Yamina [1,2*], Benbia Souheyla [2,3]

Abstract: The aim of the present study was conducted to evaluate histomorphometry of testes and efficiency spermatogenesis during sexual development in bulls and to determine their relationship with age. A total of 36 bulls were selected and divided into four groups according to their age and each group consisted of 9 bulls, namely, Group I: 10 months (= 9), Group II: 12 months (= 9), Group III: 14 months (= 9), and Group IV: 16 months (= 9). After slaughter of the animals, the left testes were taken for histological analysis. Statistical analysis revealed that the secondary spermatocytes and round and elongated spermatids were increased significantly by advancement of age ($P<0.05$). A similar pattern was described by histological analysis, in which both Sertoli cell number and Leydig cell number increased significantly by advancement of age. However, spermatogonia and primary spermatocytes ($P>0.05$) remained insignificant due to age. The mean tubular diameter increases from 200.70±5.45 µm (10 months of age) to 227.30±9.16 µm (16 months of age) and the total seminiferous tubule volume per testis from 69.63±1.50 % (10 months of age) to 84.64±2.53 % (16 months of age). A positive linear relationship ($P<0.05$) was found between meiotic index (Y) and the age (X, in month), which was characterized by the equation 0.048X+3.135 and a coefficient of correlation (R) of 0.396. The correlation between age and Sertoli cell efficiency was 0.482 with a regression equation Y= 0.141X+7.696. In conclusion, the histomorphometric of the testis of bulls was given appreciable benefits in studying the developmental changes of the testes with the advancement of the age of bulls so that, stereological examination of testicular parameters is a good tool for prediction of the future fertility of bulls.

Keywords: Histomorphology; Spermatogenic efficiency, Testis; Age; Bulls

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Time Consumption and Productivity in Wood Extraction Using Traditional Cable Car

Mirvjena Kortoci (Kellezi)[1*], Ylli Kortoci[2]

Abstract: Forests are a very important component for the environment in Albania considering the fact that they occupy more than 36% of the country's surface. The evaluation of the working time consumption and productivity of the various sub-phases of wood extraction work, in a beech forest in Albania, with traditional methods and old equipments, was considered of interest in this study to highlight the weaknesses to be corrected. Considering the slope in our study site, a traditional cable car austrian type R.Gander (A 6832 SULZ) manufactured in 1985 was used for the extraction of timber. Trunks from a distance of 800 - 900 m were extracted using this equipment. The operating team consisted of 3 workers. 10 - 15 working days are required for the assembly and disassembly of the equipmet. During the work performed, data regarding working times were collected, paying special attention to dead times, where avoidable times are high 61,0 %. The extracted volume was 31.46 m^3, which corresponds to a weight of 41.82 t.

Keywords: 12 punto, Times New Roman, not italic, between 4-6 words

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Platformlar ve Canlı Sistem Migrasyonu / Platforms and Live System Transport

İlker Ali[1*], Fehmi Skender[1]

Özet: Son yıllarda bilgisayar sistemlerinin gelişimi büyük olmuştur. Kuruluşların bir süre sonra sunucularını yeni daha hızlı sunuculara geçirmeleri gerekecektir. Ayrıca son birkaç yılda, geleneksel sistemlere göre önemli bir avantaj sağladığı için bulut sistemlerinin kullanımı önemli ölçüde artmıştır. Bulut sistemleri, maliyet performansına kıyasla daha verimli, uyarlanabilir, daha güvenlidir. Bu nedenlerle, birçok kuruluş mevcut sistemleri ve uygulamaları yeni sistemlere taşıyarak bu değerden hızlı bir şekilde yararlanmak istemektedir. Ancak yeni sistemlere ve bulutlara geçiş dikkatli bir planlama ve strateji gerektirir. Geçişte başarı için kilit noktalardan biri, bir iş uygulamasını çalıştırmak için en uygun platformu ve öncelikleri belirlemektir. Başarılı bir göç sağlamak için, eğitim ve en önemlisi uygulamaya hazırlığı kapsayan güçlü bir plan oluşturulması önemlidir.

Makalemizde, platformlar ve canlı sistem göcünü yapmak için, ilk teknik planların ve iş gerekçelerinin başarıyla nasıl oluşturulacağını belirlemekle başlıyor, ardından yüklerin beklendiği gibi çalışmasını sağlamak ve taşımayı işletme üzerinde sınırlı bir etkiye nasıl sahip olması gerektiğini açıklanmıştır. Araştırmamız, litaratür taraması yanısıra deneysel yöntemi ile tamamlanmıştır. Deneysel olarak elde edilen sonuçları ise bulut sistemleri ve sanal makinelerin sağlamlık ve güvenlik açısından ne kadar önemli olduklarını bir daha ıspatlamıştır.

Keywords: sistem göçü, platformlar, bulut sistemleri, sanal makineler, veri koruma

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Grape and Grape Products in a Healthy Life

Özlem Aras Aşcı[1*]

Abstract: Grape is important as one of the most produced fruit types in the world with 79.126 thousand tons in 7.157.658 ha area. The reason why the grape is produced so much in the world is that it has very rich consumption patterns. In addition to being used mainly for table-grape, raisin, wine and grape juice, it is also consumed in the form of molasses, vinegar, jam, compote, fruit pulp, kofter, and bastik. Brine is obtained from grape leaves. However, grape seed, oil, etc. Its extracts are also used in the pharmaceutical and cosmetic industry.

Grapes are a good source of B_1, B_6 and C vitamins. It is also an extraordinary food with a low glycemic index despite being rich in minerals such as Mg, K, and Ca. The molasses obtained from grapes has an effect of reducing and preventing iron anemia. People increasingly include grape and grape products in their diets due to their nutritional values, favorite tastes, and positive effects on health. These positive effects are due to more than 1600 compounds describe in the biochemical structure of grapes and derived mainly from phenylpropanoids, isoprenoids, and alkaloids. Flavanoids, which are phenylpropanoids, are found in very high amounts in grape juice and wine. Grape juice and red wine has an anticarcinogenic effect by preventing DNA damage due to oxidation in plasma with the potential antioxidant effect of flavonoid compounds in it. Resveratrol, a stilbene derivative found in grape seed, grape juice and wine, has been reported to prevent tumor formation in different types of cancer by showing anti-mutagenic activity. However, studies have determined that resveratrol taken with the consumption of grape products or extracts prevents many diseases such as virus development, bad cholesterol, high blood pressure, heart attack risk, Alzheimer's, Parkinson's, dementia, and neurodegeneration.

As a result, the consumption of grape and grape products, which are a store of vitamins, minerals, and antioxidants, offers a very useful alternative in terms of preventing diseases that reduce the quality of life and can sometimes be fatal.

Keywords: Grape, grape product, phenylpropanoids, human health

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Effects of exogenous boron fertilizer application in Mentha piperita L. on yield and total phenolic production

Özlem Aras Aşcı[1*]

Abstract: In addition to being a plant whose homeland is the Mediterranean region, peppermint is a plant that spreads to large areas around the world and has high economic importance. Peppermint, a perennial aromatic plant, is also used in industrial areas such as food, cosmetics and pharmaceutical industries with its menthone, isomenthone, menthofuran, tannin, pulegone, and especially menthol compounds.

Plants need boron mineral in the formation of hormones that affect growth, in the development of roots to increase the number and attitude of fruits, in the formation of buds and flowers. Therefore, it is very important to meet the boron needs of grown plants.

In this study, the effects of different ratios of sodium borate fertilizer on yield and total phenolic accumulation were investigated. The study was established in 15x50 cm pots with 40 plants per pot, according to the randomized plot trial pattern with three replications. Sodium Borate in the amount of 0, 5, 10, 15 mg / L was given to pot trials as soil and foliar fertilizer. The first treatment was applied when the plant was 25 cm tall, and the second treatment was carried out in the same dose 20 days after the first treatment. Leaf samples were harvested on the 10th, 20th, and 30th days following the last treatment. Shoot length, wet herb yield, dry herb yield, dry leaf yield, root wet and dry weight, chlorophyll and carotenoid contents and total phenolic matter accumulation were determined. It was concluded that sodium borate applications had positive effects in terms of the total phenolic matter examined.

Keywords: Peppermint, sodium borohydride, yield, total phenolic matter

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Negative Impacts of Forest Fires in Kosovo, Direct and Indirect Demages

Bojaxhi Faruk [1*], Këllezi Mirvjena [1], Kortoçi Ylli[1]

Abstract: Kosovo is situated in the central Balkan peninsula. It has an area of 10887 square kilometer and an overall forest area of 481,000 hectare. Forests and pastures in Kosovo occupy around 50% of the whole Kosovo territory. Based on the National Forest Inventory carried out on 2012, the total standing volume is 46.3 Million cubic meter. Natural broadleaves forests cover 90% of the whole forest area, while conifer forests cover about 7% represented by silver fir (*Abies alba* Mill.), norway spruce (*Picea abies* H.Karst.) and pine species. More than 60% of the forests are located in various altitudes ranging from 600 m to 1000 m.

Forests are largely contributing to the global greenhouse gas balance, in maintaining the biodiversity and in preventing of desertification. The importance of protecting forests and managing them sustainably has been acknowledged globally. It has also been acknowledged that the climate change will have an impact on forests. As these impacts will have socioeconomic and environmental consequences, it is opportune to prepare now so that forests can continue to perform all their functions under changing climate conditions. In this context, forest protection in the EU should aim at ensuring that forests continue to perform all their productive, socio-economic and environmental functions in the future.

The aim of the study is to assess the vulnerability of forest fires, their causes as well as measures to prevent them. Kosovo forests during last years have been affected by severe forest fires causing many damages with a high economic bill. The most severe fire's years were 2000, 2004, 2007, 2012 and 2015 burning about 10955 ha, with an economic damage about 4.65 Million euro.

Keywords: Forest, Fires, Environmental, Biodiversity, Damages

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In vitro antagonistic activity of *Phlebiopsis gigantea* (Fr.) Jülich against Turkish *Heterobasidion annosum* (Fr.) Bref. s.s. isolates.

Refika Ceyda Beram[1]*, Gülden Aday Kaya, Tuğba Lehtijarvi, Asko Lehtijarvi, Steve Woodward

Abstract: *Heterobasidion annosum* (Fr.) Bref. sensu stricto is the most destructive pathogen of pine species. The infection caused by pathogen occurs via fresh wounds and freshly cut stump surfaces and spreads to neighbouring trees via root-to root contacts. Abundant spores of *H. annosum* increase the risk for infection of freshly cut stumps or branches, and these can lead to heavy infections in later stages of the healthy rotation. It has been recently recorded in *P. brutia* Ten. regeneration area in southern west of the Turkey forests as causing severe mortality on red pines. Therefore, in order to prevent future widespread and heavy attacks, a control strategy against *H. annosum* have to be planned in damaged areas. An efficient biological control of the *H. annosum* by treatment with a commercial preparation *Phlebiopsis gigantea* (Fr.) Jülich (Rotstop) has been reported for various conifer species in many countries. However, there are limited information about Turkish isolates of *P. gigantea* efficiency on Turkish *H. annosum* isolates. In this study, Two *P. gigantea* isolates obtained from *P. brutia* stumps were tested in a dual culture assay against 20 *H. annosum* which was isolated from dying *P. brutia* roots. The percentage inhibition of radial growth of *H. annosum* and the zone of inhibition between both colonies were recorded. Results of antagonism tests showed that one of *P. gigantea* isolate was able to overgrow %80 of *H. annosum* isolates and the other *P. gigantea* isolate produced a clear inhibition zone against %10 *annosum* isolates. In conclusion, after testing antagonistic effect of studied *P. gigantea* isolates in vivo conditions, we can clarify it as biocontrol agent against *H. annosum* infections in pine forests.

Keywords: annosum root rot, biological control, efficacy, in vitro.

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The Importance of Population Structure Studies in Forest Pathology and Molecular Markers in Use

Refika Ceyda Beram[1*]

Abstract: The term of population structure refers to the amount and spread of genetic variation within or among populations and is directed by the combined effects of evolutionary processes that include recombination, mutation, genetic drift and natural selection. Developing appropriate and effective control strategies for tree diseases may only be possible if the biological characteristics and population structure of the causative agent are well defined. Characterizing the population structure is very important to be able to compare past and present distribution of the natural populations and to detect the continuity of evolutionarily stable species. There are many studies in which morphological, physiological and biochemical differences of organisms are used to determine genetic diversity from past to present but these methods are affected by environmental factors and require a long period of follow-up. Molecular markers have opened exciting new windows on the biological world and have totally changed our view of nature, and in the process, they have evolved themselves. With the development of molecular marker techniques that enable the comparison of DNA of individuals at a molecular level, genetic materials in different ecologies can be characterized more easily, thus genetic variations of individuals can be determined more quickly and reliably. Thanks to molecular markers, DNA sequence differences belonging to different genotypes are measured and a desired gene or trait can be observed in the investigated genotypes. Molecular marker techniques are generally based on the detection of polymorphic regions in the DNA molecule. The rate of polymorphism observed in molecular marker technique studies performed with a small amount of DNA is determined in a higher amount compared to studies performed with morphological and biochemical marker techniques.

Molecular markers in terms of methods used; hybridization-based markers and polymerase chain reaction (PCR) -based markers. After the discovery of PCR, a significant increase has been observed in PCR-based marker techniques, which are more efficient and widely applicable, especially for population structure studies. As an example of hybridization-based markers, RFLP (Restriction Fragment Length Polymorphism), as an example of PCR based markers; SSR (Simple Sequence Repeat), VNTR (Variable Number Tandem Repeat), RAPD (Random Amplified Polymorphic DNA), AFLP (Amplified Fragment Length Polymorphism) and ISSR (Inter Simple Sequence Repeat) marker types can be given. These markers have been used in many studies of forest pathogens over the years. In this review, the importance of population structure studies in forest pathology were discussed and the most popular molecular markers types employed in the forest pathology researches and their usage were summarized in general.

Keywords: Forest pathology, Molecular marker, Population structure, Genetic variation.

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A Holistic Approach: Should European Countries Utilize Medicinal Plants as Part of Routine Eye-Care?

Nurbanu Somani[1*], Parin Somani[2]

Abstract: As human life longevity increases, a deterioration in health can occur. This requires medical attention generally leading to the consumption of medication prescribed by medical practitioners. However, more than ever before many individuals are exploring alternative options to improve health, alleviate pain and increase life longivity globally. This includes herbal remedies through homeopathy and Ayurveda being the most popular forms. Individuals in European countries are accustomed to having routine eye checks and are provided conventional treatment options as a primary solution opposed to herbal remedies. The objective of this study is to understand if European countries should utilize medicinal plants as part of routine eye-care. A systematic literature review was carried out through an electronic and manual literature search. The following databases were searched; PubMed, Lexis Nexis, Blackwell Synergy, FSTA, Science Direct, GALE, Google Scholar and other information sources, publications, grey literature, magazines and journals. This study has identified that biodiversity has been utilised by human beings and conserved in a sustainable manner. This is important as biodiversity can help individuals to aid prevention and recovery from illnesses and diseases. Numerous plant species are utilised within the drug industry. Approximately 2000 different plant species are utilised for Ayurvedic purposes and 482 in homoeopathy only between 20 to 25% used commercially around the world. There is limited literature present to investigate the use of medical plants to treat the respective eye conditions with some evidence of the safety and efficacy of the use of the medical plants. Homoeopathy and Ayurveda remedies have become increasingly popular, within European countries although they are more popular in the Eastern world. Considering medical plants have been around for centuries and can be found in mediaeval literature there are very limited number of clinical based trials conducted. However, all eye-conditions showed some form of ocular improvement through studies. Despite the scarcity of the number of clinical studies found, the results were positive illustrating improvements. A better awareness of Ayurveda advantages of medicinal plants in European countries is required for individuals to make their own informed decisions and relive the global eye-health burden.

Keywords: Medicinal plants, Homeopathy, Ayurveda, Eye-care, Europe

1. Introduction

Eyesight is one of the human five major senses, hence it is not surprising that eye care is given great importance around the world. In Europe eye care services that look after the health of human eyes is provided and considered to be part of human health and wellbeing, although not all the services provided are uniformed (Thomas, weegen, Walendzik, Wasem, & Jahn, 2011). It is believed that there will be an increasing demand in the future of eye care, as 2.2 billion

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people have a vision impairment or blindness of which 25 million reside in the UK (WHO, 2019). It is predicted that the number of vision impairment cases are likely to increase to over 4 billion by 2050 (Bourne, et al., 2017).

Eye-care services in Europe can be provided by private institutions or the Sate (Kocur & Resnikoff, 2002). Eye-care is maintained by optometrists who are the primary healthcare practitioners of the visual system on the eye, providing comprehensive eye and vision care. This includes refraction and dispensing, eye disease diagnosis and management and detection, rehabilitating conditions of the visual system (Woo, 2010). Although there are continuous scientific improvements and many technological advancements particularly living in this fourth industrial revolution, eye-care management or reversing vision impairments are still lagging. Despite plethora research advancements of various sciences and technology, problems with management of various eye conditions remained unsolved.

Historically, conditions like age-related cataracts, macular degeneration, glaucoma, conjunctivitis, dry eyes, retinitis pigmentosa did not exist. The only eye epidemic was myopia-short sightedness which is when an individual sees close objects easier than objects at a distance (Fredrick, 2002). Hyperopia which is long sightedness and refers to seeing objects in the distance (Iribarren, et al., 2015), while amblyopia is when an individual can develop a squint their eyes and can be caused by visual deprivation particularly in early life (Wong, 2014). Presbyopia which occurs as a result of progressive age, losing the lens accommodation in the eye, resulting in the most prevalent physiological change that occurs within an adult. It is also the condition recognised universally, resulting in near vision impairment which progresses with age (Patel & West, 2007). These eye conditions have only appeared during the past four centuries, with an acceleration over the past hundred years and a continuous increase in the number of eye-related conditions to present day. It predicted that by 2050 the number of vision impairment cases is likely to increase to over four billion. As human life longevity increases, a deterioration in health can occur, alhough sometimes the rate of health deterioration is independent from aging (Blagosklonny, 2010). This requires medical attention generally leading to the consumption of medication prescribed by medical practitioners. But more than ever before many individuals are exploring alternative options to improve health and alleviate pain, increase life longivity and improve eye-care globally.

Medicinal plants

Medicinal plants are also referred to as medicinal herbs, which possess several compounds and can cure disease and strengthen immunity. Approximately 80% of the population are dependent on medicinal plants in Africa and Asia, while many countries in Europe, South America and Australia have "documented ethnomedicine against various diseases" (Mahapatra, et al., 2019). Ethnomedicine has been used as an alternative to traditional medicine learning from culture. Medicinal plants have always had a major role as the source for drop lead compounds because within history human beings used to treat their illnesses using plants. This stemmed from human beings relying on their taste, instinct and experiences, therefore medicinal plants have had a long lasting history with humans (Singh & Geetanjali, 2018). Over the year's researchers have been pursuing substances that can improve health and increase life longevity. Ayurveda can be viewed to balancing philosophies and disease results. Mediaeval literature reflected within holy scriptures including the Holy Bible, Holy Qur'an, The Bhagavat Geeta and associated Vedas etc refer to the fact that we can eat every tree of the garden freely including whole-some fresh fruit, vegetables, herbs, plants. There are also references to many natural products including; topical doses of Ajana's which have been referred to in the Iteraya Branmana for ophthalmic

use. The Garuda Purna mentions Analgesic drugs, as does Buddhist tradition literature. Therefore, plants, metals, minerals and animal products have been used historically in alleviating a wide range of health-related problems, hence used for medicinal purposes including eye conditions. However ocular and the antiquity of ophthalmic use of metals and minerals require special attention to develop and explore the hidden medical knowledge for better management of ophthalmic conditions. Ayurveda aims to decrease disease particularly chronic conditions with promoting positivity in the mind body and health towards a path of transformation and a renewed sense of being. this is then intended to increase enthusiasm while encouraging creativity and adaptability (Frawley, 1999). Individuals in European countries are accustomed to having routine eye checks and are provided conventional treatments options as a primary solution opposed to herbal remedies.

The objective of this study is to understand if European countries should utilize medicinal plants as part of routine eye-care.

2. Method

A systematic literature review is carried out through an electronic and manual literature search. The following electronic databases were searched; PubMed, Lexis Nexis, Blackwell Synergy, FSTA, Science Direct, GALE, Google Scholar and other information sources, publications, grey literature, magazines and journals. A well-constructed process is implemented pertaning to understanding if European countries should utilize medicinal plants as part of routine eye-care. This involves searching for, extration of, evaluating and interprating; relavant existing works of literature to use as primary sources of information in this study.

The following four research questions were devised to be addressed in this systematic literature review:

Q1. What are ocular conditions or impairments?
Q2. What are the Ayurvedic medicinal plants that can help eye-care?
Q3. Have there been any clinical trials on Ayurvedic medicinal plants?
Q4. Should European countries utilize medicinal plants as part of routine eye-care?

An initial highly sensitive literature search was carried out using the following key words: ‘Visual impairment’, ‘Eye-care’, ‘Europe’, ‘Medicinal plants’, ‘Ayurveda’. This resulted in a number of papers, however it is important to identify necessary papers that complied with the specific research questions. The inclusion criteria consists of openended, published studies and grey literature. The following exclusion criteria was applied prior to deciding on the final selection of primary studies to be used within this study.

- Papers irrelevant to medicinal plants and eye-care are omitted
- Papers that focus primarily on Ayuveda without reference to eye-care or visual impairment are excluded
- Papers in languages other than English are disregarded
- Papers that do not deliver sufficient technical information regarding their approaches are not used

In addition a further electronic search via the ‘Google’ search engine was conducted to find more inofrmation on this subject area. Post-electronic search, a total of eighteen papers were identified for investigation. Upon examining the papers two were duplicated and not used. After

reading abstracts and introductions a further three papers were rejected leaving thirteen papers for investigation. Having read the full paper another paper was removed due to a lack of implementation details. Therefore, twelve papers were identified and used as primary studies.

3. Results

There has been a concerning rise in vision impairment cases in the contemporary world in comparison to history. This has been a consequence of changes in diet, particularly the consumption of junk food with limited consumption of nutrients, vitamins and minerals. This has been proven to result in the commencement of nutritional optic neuropathy and this could be more prevalent in the future (Harrison, Warburton, Lux, & Atan, 2019). With wholesome plant-based diets, particularly veganism becoming more popular, good health implications have been identified (Somani, 2020). However, along with the health benefits there has been identification of the insufficient supplementation of vitamin B12, which is important to maintain good vision. There is also more exposure to toxins through heavy metals that can have an effect on vision (Mulak, Misiuk-Hojło, Markuszewski, & Dembska, 2008), artificial radiation (Croner, 2020), usage of medicines Pro-longed periods of use of computers, laptops, television leading to dry eyes (Akkaya, Atakan, Acikalin, Aksoy, & Ozkurt, 2018). European countries have archetypical differences relating to primary eye care construction, for example differences can be noted between France Germany and the United Kingdom. The United Kingdom educates optometrists as the primary care providers, while France deliver's services through ophthalmologists, while Germany uses a mixed model to deliver primary eye care.

The classification of plants is a major challenge in the evolution of medicinal plants, although over the year's taxonomy introduced various approaches for classification, for example morphology classification, chemotaxonomic classification and anatomic classification. It is chemotaxonomy classification that is associated with modern plant classification while the others are traditional classifications (Singh & Geetanjali, 2018). Medicinal plants are characterised through their chemical character however with the progression of time there has been an introduction off less possibilities then limitation.

Most medicinal plants have very little or no toxic adverse effects however some medicinal plants can have toxic effects to damaging human body organs and animals. Therefore, medicinal plants must be used with caution. There is a rise in the use of medicinal plants generally particularly due to affordability, they are easily available accessible, with effective results particularly when compared to high cost and side effects of widely used synthetic drugs (Okoye, Uzor, Onyeto, & Okereke, 2014). In many cases where orthodox medicine has failed, many individuals use medicinal plants as an alternative. They have felt inhibition of pain and the symptoms of inflammation reduced, sometimes it has been confused as a resolution to the health condition they are facing (Otimenyin, 2018). Each country has their own methods and cures for disease which have evolved as a result of conditions geographical locations including flora, fauna and minerals. It has been highlighted within historic literature like the Hindu Vedas, that ayurvedic drugs and associated therapies can be utilised to alleviate a variety of ocular conditions. There have been many references made to using natural resources as topical ophthalmic dosage forms but require validation. Ayurveda has been proven to provide an effective approach to manage different health conditions. According to research approximately fifty ophthalmic medicinal plants and forty metal minerals have been identified having "diverse pharmacological actions on the visual system and adnexa of the eye" (Srikanth, Haripriya, Khanduri, & Kimar, 2014). Research has identified uses of the following medicinal plants names through their botanical names:

General ophthalmic conditions: Abrus precatorius, Asparagus racemosus, Berberis aristate, Cassia absus, Clitorea ternate, Emblica officinalis, Trichosanthus dioica, Musa paradisiaca, Pinus roxburghii, Raphanus sativus, Symplocos racemose, Ervatamica divaricate, Tamarindus indica, Terminalia chebula, Aquilaria agallocha and Veleriana wallichii.

Ophthalmic allergies: Tinospora cordifolis, Berberis aristata, Boerhaavia diffusa, Tamarindus indica, Azadirachta indica vyathapaha

Visual disorders and adnexa :The following medicinal plants are viewed to alleviate doshas which in Ayurveda consists of three bio-elements that are present within an individual's body namely wind, bile and phlegm (Wujastyk, 1998): Berberis aristata, Moringa concanensis, Veleriana wallichii. The following Plants are conducive to vision and adnexa: Phyla nodiflora, Terminalia belarica and Vitex negundo.

Acute visual disturbances with congestion or inflammation: Strychnos potatorum, Strychnos potatorum, Saccharum and officinarum

Ophthalmic inflammation: Cassia absus, Nerium oleander, Emblica officinalis,Moringa oleifera

Ocular inflammation: Nerium oleander, Moringa oleifera

Swelling eyelid and eye lid: Berberis aristate

Specific eye inflammation conditions: Emblica officinalis, Moringa oleifera, Berberis aristate, Momordica charantia, Santalum album, Solanum verginianum, Leucas cephalotes. Strychnos potatorum, Tamarindus indica.

Medicinal plants useful for ophthalmic pain management: Berberis aristate, Eclipta alba, Aquilaria agallocha, Jasminum, grandiflorum, Azadirachta indica, Moringa oleifera, Foeniculum vulgare, Derris indicia, Raphanus sativus, Rubia cordifolia, Tamarindus indica , Terminalia chebula, Tinospora cordifolia.

General medicinal plants to help the organ of the eye: Allium sativum, Aloe vera, Asparagus racemosus, Berberis aristate, Abelmoschus moschatus
Nimba Azadirachta indica, Solanum verginianum.

Cataracts management: Tinospora cordifolia

To improve visual acuity and visual disorders: Syzygium aromaticum, Cassia absus, Cinnamomum camphora, Clitorea tarnatea, Cuminum cyminum, Emblica officinalis, Ferula narthex, Glycyrrhiza glabra, Jasminum grandiflorum , Leptadenia reticulata, Phyla nodiflora, Momordica charantia, Moringa oleifera, Nerium oleander, Vigna trilobata, Derris indica, Strychnos potatorum, Symplocos racemos, Teramnus labialis, Terminalia bellirica, Terminalia chebula, Tinospora cordifolia, Vitis vinifera.

Medicinal plant to manage night-blindness: Sesbania grandiflora, Eclipta alba, Leptadenia reticulata, Hyydnocarpus laurifolia, Asparagus recemosus, Boerhaavia diffusa and Berberis aristata

Varied aetiology blindness: Abrus precatorius

Corneal ulcer and Opacity, Epiphora and Lacrimiationn: Boerhaavia diffusa, Clitorea ternatea, Derris indica, Boerhaavia diffusa, Cinnamomum
Camphora, Linum usitatissimum.

Degenerative conditions- conjunctiva- pterygium: Tinospora cordifolia and Hydnocarpus laurifolia

Visual disorders management: Tinospora cordifolia, Hydnocarpus laurifolia, Momordica charantia, Hydnocarpus laurifolia, Sesbania grandiflora

Haemorrhagic eye conditions: Strychnos potatorum

Cornea and sclera disorders: Terminalia bellirica and Tinospora cordifolia

Despite the numerous medicinal plants that have been identified, only twelve clinical trials have been identified and presented in Table 1. It illustrated the number of clinical trials that have taken place, investigating the use of medical plants to treat the respective eye conditions.

Condition	**Medical Plant**	**Year of research**	**Ocular health improvement**
Age-Related Immature Cataract	Root distillate drops of Beautia Monosperma	(2006)	Y-follow up showed no further deterioration of the vision
Chronic Simple Glaucoma	Maha triphala and boerheevia diffusa	(2003)	Y
Diabetic Retinopathy	Tarpana with Patoladi ghrta	(2000)	Y
Retinitis Pigmentosa	Tinospora cordifolia Zinc Oxide Emblica officinalis CaCo3	(2005)	Y-prevention in future progress
Age Related Macular Degeneration	Amalaki Emblica Officinalis	(2008)	Y- in management of condition
Dry Eye Syndrome	Curcuma longa Berberis aristata	(2001)	Y
Abnormal involuntary movements of the eye	Patoladighirta Ekangavirarasa Ksheerabalatlia Asvagandha	(2003)	Y- follow up did not show recurrence
Pain Management in ocular conditions	Rubia cordifolia Rasakriya	(2000)	Y
Myopia	Achyotana	(2005)	Some cases

	Netra kriya kalpas Berberis Aristata		
Allergic Conjunctivitis	Achyotana Berberis aristata	(2003)	Y
Viral Conjunctivitis	Azadirachta indica A.juss Albegzia lebbeck benth	(2007)	Y
Simple Conjunctivitis	Glycyrrhiza glabra Linn. Cyperus rotindus	(1980)	Y

Table 1.

Considering medical plants have existed for centuries a very limited number of studies have been conducted. However, the results of each study have indicated an improvement on eye-conditions and demonstrated a positive effect on ocular improvement. Hence, despite the scarcity of the clinical studies stated, the results were very promising and can be built upon.

4. Discussion and Conclusions

To date Ayurveda is the most well-recognized alternative study of medicine. It known for its herbal and natural remedies to cure health conditions using resources from nature itself. Ayurveda is adopted by various popular holistic medical doctors such as Dr. Deepak Chopra, Dr. Dean Ornish, Dr Cadewell. The clinical trials within this study provided some evidence of the safety and efficacy of the use of the medical plants. However, the research design lacked rigor as the quality of the research designed noted unclear outcome measures. The patients were not masked, and they were are the only studies that were used in the literature so there was nothing to compare it to. Ayurveda portrays distinct concepts and principles of management of eye diseases. There are many references pertaining to a variety of natural products as topical ophthalmic. However, results have shown that additional attention is required to explore underdeveloped medical knowledge in this area.

Medicinal plants encapsulate the knowledge and wisdom within cultures and history, having an important part in treating ocular and other human disorders. Ayurveda provides overall a safe incomprehensive approach with effective result to manage different components of eye- care. There have been a few ophthalmic practises that have been utilised comprising of traditional aboriginal medicinal plants however they require feather research on the validity, safety and efficiency. Many medicinal plants have been identified with their botanic names within this study through medieval literature and used widely used within Eastern countries. This might be because locally medicinal plants are available as a remedy to eye care problems and used for generations within families, hence taken for granted without a want or need for more research. The very fact that holy scriptures have documented remedies for eyecare within their literature has resorted to blind faith and the positive attitude that they work. It was not until contemporary times that growing curiosity in herbal remedies through understanding medicinal plants and eye-care has become more prevalent. Currently, medicinal plants are being viewed as an alternative to conventional medication through understanding medicinal plant properties and ethnomedicine.

There is a need to build upon the medicinal plant mediaeval literature in current day. This is to validate findings and use the Ayurvedic pharmacology principles of pharmaco-dynamic and pharmaco-kinetic principles, to derive to a rationale. In turn this will provide conclusive results pertaining to the plant agents. Consequences of further studies, to verify conclusive benefits of medicinal plants on ocular conditions, would result in a newfound confidence within European countries. This may lead to the integration of medicinal plants into routine eye-care with beneficial results.

Although there are many references within mediaeval literature to medicinal plants, including holy scriptures, various books on clinical ophthalmology, pharmacology, surgeries and therapies, there needs to be further research on validity principles, attributes, safety and suitability. Therefore, there is a need for urbanized societies and Europe that are predominantly dependent upon conventional medication, to be opened-minded to medicinal plant properties and effects. This may result in an innovative method to overcome the current global eye-health burden.

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The Determination of Chemical Composition of *Spartium junceum* Flowers

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Abstract: In this study, it was aimed to determine the chemical composition of spartium junceum flowers which obtained from essential oil distillation process. After the essential oil extraction, the flowers lose their commercial importance and become garbage. The aim of this study is to determine the chemical composition of these flowers to be evaluated at further studies. As a result of the study, it was found that waste flowers contain 20.5 percent cellulose.

Keywords: Spartium junceum, waste flowers, cellulose, hemicellulose, lignin

1. Introduction

Spartium junceum grows naturally, in the Mediterranean basin. It is located on the northern and southern sides of the Mediterranean Sea. In our country, Canakkale, Istanbul, Kocaeli, Kastamonu, Sinop, Samsun, Trabzon, Izmir, Mugla, Antalya, Mersin, Adana, Hatay grows widely.

In the literature, *Spartium Junceum* flowers have been reported to have a sedative, antiulcer, diuretic, analgesic, anti-inflammatory and antitumor effect (Cerchiara et al. 2013). The stems of the plant are also used in fiber production. The resulting fiber is a biodegradable fiber. It is also of interest due to its high mechanical strength. Gabriele et al. In 2010, they obtained a high yield fiber material in their study, Cerchiara et al. In 2014, they proved to be much more durable than linen fabrics.

In recent years, the natural curative of new antioxidants to treat wounds has gained momentum (Süntar et al. 2012).

Cotton farming involves environmental risks due to intensive use of pesticides that pollute rivers and groundwater. Moreover, if cotton is cultivated intensively, it requires large amounts of water for irrigation causing soil desalinization and hence a degradation of soil fertility. Taking into account these disadvantages, we explored the potential use of Spanish Broom waste flowers as celloluse source. The choice of Spanish Broom waste flowers as a fiber source depends on many factors including low cost, availability and hydrophilic character. In fact,

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Spanish Broom fibers as well as cotton fibers are composed of cellulose and can be extracted by an easy, efficient, convenient and fast physical-chemical process, increasing the possibility of extensive application of these fibers in various fields including pharmaceutical (Cerchiara et al., 2010).

Spanish Broom is a small shrub available in Mediterranean countries, where it grows spontaneously. In comparison with flax and hemp, Spanish Broom grows in the most unfavorable limestone soil and once planted it can be used during a period of up to twenty years, while hemp and flax demand high quality soil each year.

Cerchiara et al. (2010) found that flax is often used to produce natural cellulose fibers with properties suitable for composite, textile and other high-value fiber applications. Spartium junceum fibers, extracted through a physical-chemical process, are a source of cellulose fibers that can be used in various fields (textile, paper, composites, etc.).

In their research, chemical composition, morphology and tensile properties of spartium junceum fibers are to compare with flax.

The morphology of both fibers was formed by optical microscope (OM), and the chemical composition and tensile properties of spartium junceum fibers were determined according to traditional methods. The results show that Spartium junceum fibers have higher cellulose content (91.7%) and better tensile properties than flax fibers. Spartium junceum fibers have been found to have very good tensile properties as well as thermal stability and successfully replace flax in many applications (Cerchiara et al.2014).

When the scientific studies on spartıum junceum are examined, Bezic et al. 2003 stated indicates that there exists spartein had an analeptic effect on the body of the plant. Therefore, before the cellulose is extracted from the plant stems, the stem components of the plant grown in this region will be determined by extracting the stems with polar and apolar solvents.

2. Materials and Methods

Waste spartium junceum flowers were used as cellulosic material in the study. All chemicals used in the study are at the analytical purity. Waste flowers were analyzed according to the following methods.

2.1. Determination of cellulose content

The cellulose content determination of waste spartium junceum flowers was made by the Kurschner and Hoffer method (1931). Approximately 2 g of sample is treated with 100 mL 1:4 (V/V nitric acid and ethanol mixture and then wait for boiling under reflux for 1 hour. After boiling for one hour, the sample is filtered and this process is repeated 3 times. After cooling remaining cellulose was filtered and washed with pure water until the filtrate water is neutralized.

2.2. Determination of holocellulose content

Holocellulose is the carbohydrate complex that remains after the lignin substance of the wood is separated. In the study, the Chlorite Method, which was developed by Wise and Karl (1962), was used to determine the amount of holocellulose.

2.3. Determination of lignin content

When cellulosic material is treated with different acids, carbohydrates, one of its main compounds, dissolve as hydrolysis. The insoluble lignin composition due to its resistance to acids is remains. The lignin determination of waste spartium junceum flowers was made according to Beram and Yaşar method (2020). 1 g of waste flower was first hydrolyzed in the autoclave in 20 mL of 72% H_2SO_4 at 30 °C for 2 hours, followed by 120 °C for 30 minutes after adding 360 mL distilled water. Then, the Klason lignin obtained in the form of residue after filtering was dried at 105±2 °C and expressed as the percentage of oven dry material.

3. Results

Table 1. Chemical Composition of Spartium Junceum Flowers

Material	%
Cellulose	20.5
Holocellulose	52.908
Lignin	34.46

Table 1 shows the chemical composition of spartium junceum flowers. Results shows that waste flowers includes high amount of cellulose. This cellulose can be used for production of green chemical products. Wood plants includes over 50% cellulose. As expected, the flowers do not contain as much cellulose as woody plants. However, as experimental results show, they contain too valuable natural polymers not to be completely garbage. Meessen et al. (2018) determined chemical composition of Lavender- and lavandin-distilled straws. They found that Lavender- and lavandin-distilled straws includes 16-17 % cellulose at stem straws and 8% cellulose at flowers straws. Bekdaş and Karaboyacı (2019), made a study for the production of paper from rose wastes. They found celloluse content of waste flowers over 36%. All these results shows that these kind of wastes are cheap non food renewable plant biomass, and they can be used as a feedstocks for different industries.

4. Discussion and Conclusion

This study shows that the distilled flowers of spartium junceum are lignocellulosic- rich materials. this wastes can be used as raw material for producing cellulosic materials. This study was carried out to determine the cellulose content of spartium junceum flowers. In the advanced stage of the work, this cellulose content will be converted into cellulose acetate and used in fiber spinning.

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Dyeing of Red Pine (*Pinus brutia* Ten.) with Turnip Juice Containing Natural Anthocyanin Dyestuff

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Abstract: In this study, the dyeability of red pine (*Pinus brutia* Ten.) with natural dyes was investigated. Turnip juice, a local beverage containing high levels of anthocyanins, was used as a natural coloring agent. Wood specimens were impregnated with turnip juice according to ASTM D 1413-76 (1976). $NaHCO_3$ and $FeSO_4.7H_2O$ were used as mordants for to obtain different colors shades. Colors of the dyed woods were measured by spectrophotometer according to CIE Lab method. The obtained results shows that turnip juice can be used as a natural dye resource and that the red pine can be colored with natural dyes.

Keywords: Red pine, natural dyes, turnip juice, anthocyanin dye.

1. Introduction

As the side effects of environmental problems are felt by people, the trend towards natural and environmentally friendly products is increasing day by day. Both the increasing interest in environmentally friendly products and the strict environmental rules in many countries applied on synthetic dyestuffs that cause toxic and allergic reactions cause the search for new environmentally friendly production methods in the paint industry. For this purpose, companies are trying to minimize the use of chemicals that are considered hazardous to human and environmental health during the design of new products, to support aqueous product design and use, and to design products that can be applied with less energy. For this reason, scientists have recently begun to work on painting wood with natural dyes. Göktaş et al. (2015) performed a study about coloring the wood material with aspir plant extracts and determining the performance of color change. Zhu et al. (2018) performed a study about colorability of dyed wood veneer using natural dye extracted from dalbergia cochinchinensis with different organic solvents. Yeniocak at al. (2018) performed a study about determination of color change values after UV exposure of wood material colored with peach leaf extraction.

This and similar studies reveal scientific interest in coloring wood materials with natural dyes. In this study, the dyeability of red pine with natural anthocyanin dyestuffs was investigated. Turnip juice used as as a source of anthocyanin. Turnip (shalgam) juice is a dark red colored and sour tasted fermented beverage produced and consumed in Turkey especially in Adana region. The main ingredient of shalgam juice is black carrot gives that drink its dark red color which is rich in anthocyanins. Tanguler et al. (2020) performed a study about comparison of anthocyanin profiles in shalgams produced with different production procedures. They found that turnip juice includes total concentration of anthocyanins highest 299,20 mg/L their high

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anthocyanin stability, Black carrots are a good source of anthocyanin pigments. Mazza and Miniati (1993) reported the anthocyanin content of black carrots to be 1750 mg kg^{-1} fresh weight. Recently, Kammerer et al. (2004) found that total anthocyanin contents of black carrots ranged from 45.4 mg kg^{-1} to 17.4 g kg^{-1} dry matter.

The dyeings were made by the impregnation method. The superiority of this method can be explained as follows. Besides surface coloration, the colour of the whole volume of wood pieces or wood-based products can be changed by impregnation with dyes. In comparison to shallow staining methods, the coloration by impregnation allows machine finishing without changing the colour. Furthermore, scratches and other injuries do not appear as obvious when deeper layers show the same colour as the surface (Weigl et al. 2009).

2. Material and Method

The red pine samples to be impregnated were cut in 50 x 50 x 10 mm dimensions. A vacuum desiccator used for the impregnation process. It was connected to a vacuum pump through a vacuum trap. In the impregnation process, the samples were kept at room temperature for 30 minutes under vacuum (760 mm Hg). Then they were removed from the vacuum environment and kept for 30 minutes at normal atmospheric pressure at room temperature.

$NaHCO_3$ and $FeSO_4.7H_2O$ were used as mordants. Dyeing process were carried out with raw turnip juice, turnip juice containing 1 g/L $NaHCO_3$, turnip juice containing 5 g/L $NaHCO_3$, turnip juice containing 1 g/L $FeSO_4.7H_2O$ and turnip containing 1 g/L $FeSO_4.7H_2O$ and 1 g/L $NaHCO_3$. All dyeing were repeated 5 times.

$NaHCO_3$ is not actually a mordant substance. It is an ecological base used to raise the pH value of the solution. Because natural anthocyanins dyes have a sensitive color reaction to wide pH ranges. Choi et al. (2017) performed a study about developing a intelligent pH indicator film composed of agar potato starch and anthocyanin extracts from purple sweet potato. They extracted anthocyanin dyes from sweet potato and make a test about their color variation depends on the pH. They found that solutions turned red when the pH of the solution was lower than 4.0 and turned pink, purple, and blue when the pH of the solution was 5.0–6.0, 7.0, and 8.0, respectively. The colors of potato solutions had a tendency to change from purple to green in a pH range of 7.0–10.0.

In this study, $NaHCO_3$ was used to change the pH value of the solution to obtain a different color tone.

The dyed red pines were analyzed with CIE-Lab color space. L* axis gives the darkness or brightness degree of the color. L* =100, means that the color of the sample is white and L* = 0, means that the color of the sample is black. a* and b* axes are no numerical limits. Positive a* means that color tone goes to red while negative a* means that color goes to green side. Positive b* means that color goes to yellowish side while negative b* means that color goes to blue side.

3. Results

Table 1. L a* b* values of red pine dyed with turnip juice. pH of the raw turnip juice is over 6. So red pines dyed with turnip juice looks like bluish pink. Because anthocyanins, which change color depending on pH, give this color at pH 6. In addition, even samples impregnated

with only turnip juice, has enough amount of dyestuff to color the wood. This result confirms the idea that turnip juice is a good anthocyanin source and can be used as a natural dye. Figure 1 d shows the color of red pine dyed with turnip juice +1 g/L $NaHCO_3$. As expected color goes to blue side and a little bit darken. At table 1 b* value of turnip juice +1 g/L $NaHCO_3$ confirms this result. Average b* value of raw dyeing is 9,36 but average b* value of raw turnip juice +1 g/L $NaHCO_3$ is 5.76. also a* shows color goes to more greenish side with $NaHCO_3$ addition. Addition of 5 g/L $NaHCO_3$ makes color more light but more greener so it looks likes khaki. Figure 1 e shows the color of red pine dyed with turnip juice +1 g/L $FeSO_4$. $FeSO_4$ is a mordan because it gives divalent Fe^{2+} ions. It can connect with dye and the wood at the same time and can increase dye adsorption. Because of that chemical connection it can also change the color of dye. $FeSO_4$ converts color to blue also more darker and more yellowish side. At can see from the Lab values. Addition of turnip juice 1 g/L $FeSO_4.7H_2O$ and 1 g/L $NaHCO_3$ makes color more dark and bright blue than only adding 1 g/L $FeSO_4.7H_2O$. Lab values also confirms the results. a^* and b^* values goes to negative side. This means color is more green and more blue than all other ones.

Table 1. L a^* b^* values of red pine dyed with turnip juice

	L	**a^***	**b^***	**C**	**H**
Raw turnip juice	56,42	27,64	9,55	29,24	19
	53,65	27,12	8,8	28,5	17,97
	55.7	25	10,6	28	22
	54,1	23	6,5	25	15
	54,9	29	11,35	31,4	21,16
Turnip juice +1 g/L $NaHCO_3$	54,5	18,9	5,23	19,64	15,47
	53,41	21,93	5,76	22,67	14,68
	53,22	17,3	3,46	17,65	11,29
	53,95	21	6,35	22	16,76
	54,01	21	8	22	21
Turnip juice +5 g/L $NaHCO_3$	58	10,54	6,28	12,28	30,78
	61,38	8,36	8,51	11,93	45,52
	57,95	11,62	6,12	13,13	27,77
	61,55	8,31	9,26	12,44	48,12
	58,47	7	7,55	10,3	47,13
Turnip juice +1 g/L $FeSO_4.7H_2O$	52,85	2,42	1,08	2,65	24
	51,8	1,53	0,38	1,53	14,13
	50,7	2,5	0,87	1,76	26
	52	2,4	0,9	2,5	21,9
	51,87	2,3	0,66	2,39	16,06
Turnip juice +1 g/L $FeSO_4.7H_2O$ +1 g/L $NaHCO_3$	48,87	-1,26	-4,44	4,3	252
	47	-1,36	-5,34	5,17	255
	46	-1,67	-3,39	3,78	243
	47,27	-1,96	-4,74	5,13	247
	47,62	-1,58	-4	4,3	248

Figure 1. Dyed red pine samples. **a** is raw turnip juice, **b** is turnip juice +5 g/L $NaHCO_3$, **c** is turnip juice +1 g/L $FeSO_4.7H_2O$ +1 g/L $NaHCO_3$, **d** is turnip juice +1 g/L $NaHCO_3$, **e** is turnip juice +1 g/L $FeSO_4$

4. Discussion and Conclusions

The aim of this study was to investigate the dyeing of wooden materials by impregnation method with natural dyes. For this purpose, turnip juice, a local beverage, was used as a natural dye source. The dyeing results showed us that turnip juice is a good source of natural dyes and most importantly, red pine can be dyed by impregnation with natural dyes. As a result of the study, the idea that the dyeing performance of different wooden materials with other natural dyes should be investigated. Because dyeing wooden materials with natural dyes in aqueous solution will make a great contribution to the ecology. It will also be a healthy method for dyeing wooden materials with that sensitive and allergic individuals will use.

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