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The Action of *Cleome viscosa* and *Cardiospermum halicacabum* Extracts on Fungi Associated with Otitis Media

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Abstract:

Acetone, methanol and chloroform extracts obtained from *Cleome viscosa* and *Cardiospermum halicacabum* were evaluated for their *in vitro* antifungal activity. The activity was tested against human pathogenic clinical isolates of filamentous fungi associated with otitis media by disc diffusion method. *Cleome viscosa* and *Cardiospermum halicacabum* extracts displayed highest antifungal activity with 12 and 13 mm inhibition zone respectively. Methanol extracts of *Cleome viscosa* and *Cardiospermum halicacabum* were able to inhibit 78 and 72% fungal isolates respectively while the standard antifungal agent fluconazole exhibited extremely poor antifungal activity. The results suggest the possible use of the above plants for the treatment of ear infections due to fungi.

Keywords:

Medicinal plant, bioactivity, pathogenic fungi.

Common Diseases of Fish Generally Occurring in and Around Nagpur

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Abstract:

Fungal infections (fungal infections are called mycoses) are among the most common diseases seen in temperate fish because fungal spores are found in all fish ponds and create problems in stressed fish. Poor water quality can also lead to an increase in fungal infections in an otherwise healthy fish population. Most fungal infections only attack the external tissues and only few fungal infections that will infect the internal organs of fish. Epizootic ulcerative syndrome (EUS) is a seasonal epizootic condition of wild and farmed, fresh and brackish water fish. *Aphanomyces invadans* (Oomyete fungus) is a causative agent of EUS and it is a serious disease in fresh water and brackish water fish in Asia and Pacific. Symptoms and preventive measures of EUS is characterized by severe ulceration of the skin and muscles while bacterial infection investigation on EUS affected fish collected from various freshwater bodies showed that *Aeromonas hydrophila* and *Vibrio* sp. were prominent. Clinical Signs of disease are tiny red spot on the body surface spot later develops into ulcer, after few days loss of scales and muscles exposes body. For treatment measures, lime are given at the rate of 10- 15 kg of water spread area depending on PH of water and this is followed by application of KMnO₄ (Potash) to the pond water at the rate of 4-5 ppm (4- 5 mg/lit. of water). Antibiotic Oxytetracycline treatment may be given with feed to the infected fish along with feed at the rate of 60- 70 mg/ kg feed for 7- 10 days on need basis. These organisms are important pathogens of various fish sp. In last decade, the disease has caused extensive losses among populations of cultured fresh water fish in India. In case of bacterial diseases of fish, most are opportunistic.

Keywords:

Fish Diseases, EUS, *Aphanomyces invadans*, *Aeromonas hydrophila*

Haematological Indices In Wild Caught Emballonurid Bat, *Taphozous kachhensis* (Dobson)

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Abstract:

Insectivorous bats play an essential role in keeping populations of night flying insects in balance but little is known about their basic physiology. Haematological indices of an individual reflect the health status of that animal. Thus, the objective of this study is to investigate relationship between the reproductive status and statistical significant difference of haematological indices in male and female microchiropteran insectivorous bat, *Taphozous kachhensis* during lactation phase. For this, ten healthy male and female bats were captured from the wild habitat and anesthetized with ether. Blood samples from anesthetized bats were collected from the pectoral and subclavian veins in EDTA thoroughly mixed or double oxalated anticoagulated Eppendorf tube. Haematological parameters determined were haemoglobin, packed cell volume (PCV), mean corpuscular volume (MCV), mean corpuscular haemoglobin (MCH), mean corpuscular haemoglobin concentration (MCHC), erythrocyte count, platelet count, total leukocyte count (TLC), differential leukocyte count (DLC) and erythrocyte sedimentation rate (ESR). High haemoglobin% and high number of erythrocytes with low mean corpuscular haemoglobin (MCH) suggests the high oxygen carrying capacity of blood in *Taphozous kachhensis*. No statistically significant differences were observed in the haematological parameters between male and female bats during lactation. The values from this study can be used to create baseline data of microchiropteran bat *Taphozous kachhensis* found in central India.

Keywords:

Taphozous kachhensis, Haematological indices, microchiropteran bat

Molecular Characterization of Tetraploid Cotton (*Gossypium hirsutum*) by ISSR Markers

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Abstract:

G. hirsutum belongs to the family *Malvaceae* and is a multipurpose crop used as superior fiber properties and pest and insect resistant etc. which is tetraploid cotton. ISSR (Inter Simple Sequence Repeat) is a PCR based method involves amplification of DNA segment in between two identical microsatellite repeat regions oriented in opposite direction. ISSR classified the cultivars belonging to *G. hirsutum* species of genus *Gossypium*. ISSR markers have been used in the study to differentiate cotton cultivar belonging to a species (*G. hirsutum*) In the present study polymorphic ISSR loci clearly distinguish tetraploid cultivars and evaluates genetic diversity among *G. hirsutum* within the cultivars of same species. Dendrogram generated by ISSR markers showed similarity coefficient value in the range of 0.82 – 0.97 between *G. hirsutum* species. All 19 primers were polymorphic and produced polymorphic loci primer sequences. The number of amplification product ranged from G (IS-12, IS-09, IS-15, IS-17) to 15 (IS-01, IS-07). The most informative primers were IS-07 and IS-16 with 10 polymorphic bands and least informative were IS-18 and IS-10 with 02 Polymorphic bands. Cultivars GP-2557 (COIMBATORE) found to be most distant among all the twenty four cultivars with bootstrap support of 100 % ISSR data analyzing clearly formed two clusters.

Keywords:

Gossypium, ISSR Markers, polymorphic ISSR loci.

Cultivation, Nutritional, Micro-nutritional and Ursolic acid Quantification (HPTLC) in Organic and Conventional *Ocimum sanctum*

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Abstract:

The demand for medicinal plants is growing at the rate of about 15 % per annum. Currently a major part of it is contributed by wild sources, however with biodiversity norms 2002 in action; cultivation of medicinal plants has become indispensable to satisfy the requirement of industry. Until now no scientific studies are conducted to ascertain nutrition, phyto-constituents and safety measures of organically grown medicinal plants. In this research, *In vivo* studies were conducted to assess the morpho-physiological traits of known Holy medicinal plant *Ocimum sanctum* using organic and non-organic farming techniques. The experiment was performed in Randomized Block Design with twelve replications using (organic & non-organic) fertilizer and pesticides. The aerial parts were harvested; lyophilized and dried coarse powder was screened for nutritional, anti-nutritional, physico-chemical and mineral (by ICP-AES). The water extracts were quantified for the presence of Ursolic acid by using HPTLC. The mean performances of all the traits were higher in organic Tulsi (OOS) except the weight of plant material. Proximate analysis revealed the high caloric value (235.2 Kcal/100g DW) along with protein, lipid and crude fibers in OOS. Similarly, high mineral contents (K, Ca, Mg, Fe, Na, Zn, Cu and Mn 181.94, 45.64, 23.83, 39.35, 159.4, 75.82, 5.3 and 4.61 mg/100 g DW respectively) were found in OOS. Whereas non-organic Tulsi (NOS) contained high content of total ash, extractives, oxalate, phytate and heavy metals (Pd – 1.82 mg/100g DW). The higher amount of Ursolic acid content was found in OOS 0.17 % w/w by HPTLC method. Evidence proved the perception that organically grown foods or medicinal herbs are 'better for you' in terms of nutrition, phyto-constituents, better quality and safety measures.

Keywords:

Cultivation, HPTLC, Micro-nutritional, Nutritional, Ursolic acid.

Periodic Studies on Bacterial Decolorization of Acid Yellow Dye

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Abstract:

Excessive use of dyes particularly in textile industries has threatened aquatic as well as human life. Dyes are often introduced in the water bodies from textile or paper industries with improper treatment. Chemical treatments for dye decolorization are quite costly; another disadvantage is decolorization of these dyes is not complete. One of the approaches would be to extract bacterial flora from the effluent of textile industries which is continuously exposed to dyes. Few of this might be excellent dye decolorizers apart from this dyes are also used as source of carbon and nitrogen by some bacteria. The bacterial degradation of dyes is preferable one because dyes are completely utilized by these bacteria. The study was carried by selecting acid yellow dye. The efficient dye decolorizing bacteria includes *Pseudomonas* sp, *Alteromonassp*, *Enterococcus* sp, *Serratiasp* and *Enterobacter* sp. Periodic studies on utilization of these dyes are carried out. Dye decolorization was at peak level towards the end of second day. However the most efficient dye degrader could decolorize only 63.76% of acid yellow dye. Further these dye decolorizing bacteria can be employed for removal and / degradation of dyes into non-toxic compounds. This suggest when a suitable strategy is developed for the decolorization of dyes two day period will be sufficient to treat the effluent by these bacteria.

Keywords: Acid yellow, dye, decolorization, periodic studies.

Characterization of Enriched Nitrifiers from Vertisols of Purna Basin

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Abstract:

The *in-vitro* enrichment of soil chemoautotrophs were attempted from black cotton soils or vertisols of Purna river basin by adopting standard microbiological techniques for tracing the presence of the species of *Nitrosomonas* and *Nitrobacter* in the ammonia oxidation and nitrite oxidation broths, respectively to study soil nitrification triggered multifold due to indiscriminate, anthropogenic and commercial nitrogenous chemical fertilisation. This regional study of soil microbial nitrification was found to be important as these soils have shown higher nitrification potentials due to the presence of these nitrifying bacteria in vertisols. These bacteria enriched in liquid broths and characterised morphologically and biochemically for confirmation were preserved for its subsequent experimentation in nitrate pollution. The related details are discussed herewith.

Keywords:

Soil microbial nitrification, *Nitrosomonas*, *Nitrobacter*, black cotton soil, vertisols, Purna river basin, nitrification potential

In-vitro regeneration and phytochemical analysis of *Withania somnifera*

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Abstract:

Medicinal plants are important for human health. India is the richest country in the world as far as diversity of medicinal plants are concerned. *Withania somnifera* is an important medicinal plants which has high medicinal value.

The plants are considered as the excellent source of rejuvenator and also as the general health tonic. The *Withania* plants possess properties such as sedative, diuretic and anti-inflammatory activities and generally thought as good source of energy. Therefore *Withania somnifera* find important place in human society.

Tissue culture studies were carried out in this plant basically to standardize in-vitro propagation protocol and to investigate phytochemical parameters in regenerated plants. For this, seeds of *Withania* was obtained from local nursery of medicinal plants. The seeds were surface sterilized as per the standered procedure being used in our lab. The surface sterilized seeds were inoculated in MS medium for germination. shoot tip and meristem explants were isolated from seedling and were cultured on MS medium supplemented with different concentration and combinations of BAP (1.5 mg/L) and kinetin (1.5 mg/L) resulted in the formation of multiple shoots. In rest of the combination, shoot induction was low. The shoot bud mass proliferate into shoots which were separated and transferred in shoot elongation medium. The elongated shoots isolated and rooted on half MS medium. The plants are being tested for phytochemical analysis.

Keywords:

regeneration, *Withania somnifera*, Medicinal plants.

Regeneration of Tulsi by Shoot Organogenesis

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Abstract:

Plants are most important source of medicines. Large number of drugs are derived from the medicinal plants like morphine from papaver, Aswagandha from Withania, ephedrine from Ephedra etc. Tulsi is most commonly grown plants of high medicinal value. The plants are widely used by the traditional people for curing many diseases. In traditional system of medicine different parts of the plants are used for curing bronchitis, bronchial asthma, malaria and diarrhea etc.

In vitro manipulation of Tulsi has been carried out with the object to propagate large number of plants via callus based somatic embryogenesis/organogenesis.

The shoot tip explants of *O. sanctum* were collected from field grown plants and they were surface sterilized as per the standard procedure. The sterilized explants were inoculated on shoot multiplication media containing B5 vitamins and different combinations of BAP and Kinetin. In all 297 explants were inoculated and 19 shoot tip explants were responded to multiple shooting after 20-25 days. The shoot induction was not accompanied by callusing. The highest shoot no 36.3% was in BAP and kinetin combination (1:0.5), followed by 22.2%. In case of BAP 2 mg/L and kinetin 1 mg/L combination, highest shoot induction was 56%. The multiple shoots were periodically subculture on MS medium supplemented with kinetin for shoot elongation and rooting.

Keywords:

Regeneration, Plants, shoot, vitamins, organogenesis

A Petrified Fossil Dicot Leaf *Acanthophyllum shibliigen.* et sp. nov. from Deccan Intertrappean Exposures of Shible of Yeotmal District, Maharashtra State, India.

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Abstract:

The paper deals with the anatomical description of a fossil leaf collected from the Deccan Intertrappean sedimentary beds of the fossiliferous locality Shible from Yeotmal district of Maharashtra. However petrified leaves showing mature and young conditions are studied for anatomical details first time from these exposures. The present fossil specimen is a nicely preserved dicotyledonous and dorsiventral leaf exposed in its transverse plane. The anatomical details were studied by taking peel sections by applying cellulose acetate peel technique.

The leaf has central midrib and lateral lamina. The lateral lamina is long and continuous on both the sides forms laminar wings. Epidermis is single layered without any outgrowths like hairs or trichomes. Stomata are restricted to the upper epidermis, sub-stomatal gaps are present on upper epidermis. The mesophyll is differentiated into palisade and spongy parenchyma, the intercellular spaces are large. Epidermal and palisade cells larger and more numerous vessels in the midrib. Vascular bundle of midrib is single, large and having crescent shaped vascular strand. It is conjoint, collateral, endarch and siphonostelic type, sclerenchymatous bundle sheath present. Presence of secretory canals in midrib and spongy tissue.

The comparison is made with the recorded fossil leaf from the Deccan Intertrappean beds of India as well as living modern taxa. The fossil leaf resembles in many characters especially to the leaf of family Acanthaceae and named as *Acanthophyllum shibliigen.* et sp. nov. the specific name after the Intertrappean beds. The presence of family indicate palaeoecological evidence in Mastrichtian age during Deccan Intertrappean episode.

Keywords: Fossil leaf, sedimentary beds, peel technique, Acanthaceae, crescent shaped etc.

Use of Plant Products to Combat Insect Pest

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Abstract:

The importance of conservation of environmental quality and the preservation of extent and natural equilibria in ecosystem is now well recognised. Equally well noticed are incontrovertible evidences of gross environmental contamination and resultant ecological havoc wreaked by inundation of biosphere with vertible flood of synthetic alien molecules. However drawbacks, disadvantages, undesirable side-effects and hazards stemming from indiscriminate and extensive application of conventional insecticides have surfaced in recent years. Negative properties and effects of conventional insecticides have led to a reappraisal of their continuing role as chief bulwarks as insecticides. Environmental hazards above all can be control by ecologically oriented permissible control measures and chemicals. The trek back to nature that is the search for pest control agents from natural resources is already in stream but as India is treasure of indigenous plants and the products from the plants can be used to combat insect pest and minimization of pollution caused by synthetic pesticides.

Keywords:

Plant products, pesticides

Effect of Sodium Fluoride on ovarian Hormones and Estrous Cycle for Screening of Antifertility Activity in Female Albino Rats

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Abstract:

Fluoride has been described as an essential element needed for normal development and growth of animals and extremely useful for human beings. Fluoride gets accumulated in hard tissues of the body and has been known to play an important role in mineralization of bone and teeth. At high levels it has been known to cause dental and skeletal fluorosis. It has been proved to be beneficial in recommended doses, and at the same time its toxicity at higher levels has also been well established. There are suggested effects of very low and high levels of fluoride carried out to investigate various high and low doses of sodium fluoride (NaF) administered to female albino rat (*Rattus norvegicus*) orally through drinking water, weighing about 180 to 200gm at the dose of 5mg, 10mg, 15mg and 20mg/kg bw/day for the duration of 30 days. To find out the changes in oestrus stages and hormonal level of female rats with that of the control values of the experimental animals. The results revealed that different doses of sodium fluoride at low and high dose of rats showed significant reduction in body weight ($p < 0.001$). The cyclic changes of rat showed significant increased in proestrus ($p \leq 0.0001$), and decrease in diestrus ($p \leq 0.0001$), estrous ($p \leq 0.05$) and metestrus phase ($p \leq 0.05$). The marked alteration in oestrus cycle causes due to the decreased hormonal concentration LH, FSH and estrogen ($p \leq 0.0001$). These hormones are responsible for ovulation. Therefore, the present study suggests that sodium fluoride exposure might have some immediate effect on reproductive system.

Keywords: Female albino rats, Body weight, Oestrus cycle, Hormonal level.

An Experimental Study on Learning Memory (Intelligence) By Intoxication of Sodium Fluoride to Female Albino Rats

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Abstract:

High fluoride intake has proved a major health hazard, WHO prescribed 0.6 mg/L of fluoride as an essential quantity while above the permissible limit (1.0- 1.5 mg/L) caused a dreadful disease, fluorosis. The present study aimed at evaluation of the effect of high and low doses of sodium fluoride on intelligence in female rats. The doses provided to the experimental animals through drinking water at the concentration of 5mg, 10mg, 15mg and 20 mg/kg bw for 30 days. After 30 days, all animals were subjected to behavioral tests, like open field test results showed the significant influenced of sodium fluoride to lower and higher doses on exploratory motor activities (EMA) and emotionality with marked impairment in habituation in rats. Moreover learning and memory assessed during Maze test showed reduced memory retention for higher doses. Overall, these results showed that high concentration of sodium fluoride affected learning and memory behavior in rats.

Keyword:

Sodium fluoride, learning and memory deficits; drinking water

Low Cost Treatment of Waste Water Treatment Using Microalgae

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Abstract:

Water covers 71% of the Earth's surface, and is vital for all known forms of [life](#). But only 2.5% of the Earth's water is fresh water. Due to industrialization and Urbanization it is becoming more polluted and risk of this polluted water consumption and its sanitation problem is increasing day to day in most of the developing countries, so it has become an essential need for today's environment to protect water from getting polluted or develop its cost effective remedial method for its protection. Study was done to find out the new, low-cost waste water treatment methods in which we had found that Microalgae has the natural wastewater treatment properties. It has the self cleansing power due to which it Abstracts Nitrate 80%, sulphate 65% and Phosphate 52% for its growth and development. During their growth they trap sun light and CO₂ from the environment for their photosynthesis. While study we had found that waste water treatment using microalgae has number of positive applications over the conventional methods as it is useful in Wastewater treatment, CO₂ sequestration, Cost effective, Sanitation and also in the production of renewable sources of energy such as Biodiesel, Biofuel, Glycerol, Methane gas, Hydrogen gas, Biofertilizers etc. This Green technical method for treatment of municipal waste water using microalgae should be applied in all developing and developed countries for wastewater treatment so as to protect the environmental pollution causing due to waste water from industrial and Societies effluents.

Keywords:

treatment, wastewater, Microalgae, biodiesel

Studies on Dyes Decolorization of White Rot Fungi Isolated from Soil

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Abstract:

The present study was carried out for biodegradation of dye by using test organisms *T. hirsuta* and *WRF-Isolates*. Decolorization is an important step in the degradation of the Dye and complete decolorization was achieved by the organisms when the pH of the medium was in a range 4.0-4.5. During the incubation period in the decolorization process by the microorganisms, namely *T. hirsuta* and *WRF-Isolates* always showed a decrease in the pH from the initial condition indicating the release of the degradation products. Solid state decolorization was observed to be faster (Maximum 95% with WRF Isolates) compare to the aqueous state decolorization process. In aqueous state decolorization process, WRF isolate were showed faster decolorization of congo red (77.28 % Decolorization) and Methylene Blue (70.67%) while *T. hirsuta* one of the well known culture for dye decolorization showed less decolorization within five days (CR- 69.10% and MB- 65.34%). The finding in the present study can serve as an important base for the development of a economical as well as simplified biological treatment system using microorganisms for providing reusable clean water for industrial purpose.

Keywords:

White Rot Fungi, Decolorization, *T. Hirsuta* and Dyes

Morphometric Analysis of Olfactory Bulb of *Heteropneustes fossilis* (Bloch)

Masram S. C.¹, Sonarghare P.C.², Khaparde, K. P.³, Sonparote U. R.⁴, Ghodichor G.L.⁵ and Baile V.V.⁶

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Abstract

Olfactory system plays crucial role in mediating several behaviours like feeding, predator detection, social interaction and reproduction. In *Heteropneustes fossilis* (Bloch), olfactory system consists of olfactory rosette, olfactory tract and olfactory bulb. Paired olfactory rosettes are present in the olfactory chamber located dorsally on rostrum. Olfactory bulb is major relay centre in olfactory - hypothalamus-hypophysial axis. It receives primary olfactory projections from olfactory epithelium of olfactory rosette and sends secondary olfactory projections to forebrain. Depending upon its location, olfactory bulbs are pedunculated or sessile. In *H. fossilis*, olfactory bulbs are pedunculated as olfactory bulbs remain attached with olfactory rosettes. Olfactory bulb of *H. fossilis* comprises four layers. Outermost layer is Olfactory nerve layer (ONL) formed by axons of olfactory nerves. Beneath ONL lies glomerular layer (GL) where axons of olfactory nerves synapse with mitral cells. Mitral cell layer is formed by mitral cell. Central core of olfactory bulb is formed by granular cell layer (GCL) of granular cells. Mitral cells are larger than granular cells. Besides these cells, nervusterminalis (NT) are also observed in *H. fossilis*.

Key word:

Olfactory bulb, mitral cell, granular cell, nervusterminalis.

Studies on Qualitative Phytochemical Analysis of Selected Species of Family Verbanaceae

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Abstract:

Clerodendrum phlomidis (leaves), *C. infortunatum* (leaves) and *Gmelina arborea* (leaves), *Petrea volubilis* (leaves) and *Phyla nodiflora* (leaves) were investigated for Phytochemical and found different medicinal compounds as alkaloids, glycoside, phytosterols, saponins, phenolic compounds and tannins and proteins. Dry powder of plant samples were extracted with petroleum ether, ethanol and distilled water. The solvent free extract obtained was then subjected to qualitative tests for the identification of various plant constituent from the samples. The results revealed that among the three extracts ethanol and water extracts exhibited high test for various chemical compounds where as petroleum ether extracts showed moderate test or sometime it was negative.

Keywords:

Clerodendrum phlomidis , *C. infortunatum* , *Gmelinaarborea* , *Petreavolubilis* , *Phyla nodiflora* , medicinal plant, solvent, extract, phytochemicals

Estimation of Caffeine in Different Brands of Tea in India

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Abstract:

Tea is the most commonly and widely used soft beverage in the household. The principal constituent of tea is caffeine. Caffeine is a central nervous system stimulant. It works by stimulating the brain. Caffeine is used to restore mental alertness or wakefulness during fatigue or drowsiness. It is also used for lowering body temperature. Some people use caffeine for asthma, gallbladder disease. Caffeine is also used for weight loss and type 2 diabetes. Caffeine is most commonly used stimulant among athletes. This research paper attempts an analysis of caffeine content of different brands of tea in India. Tea is composed of many compounds besides caffeine. These components have various effects depending upon the amount of tea ingested and the quality of tea. Among three brands of tea Red Label (Brooke Bond) has the highest Caffeine content while Green tea has lowest Caffeine content.

Keywords:

Caffeine, Tea

Estimation of Nicotine in Different Popular Brands of Cigarettes

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Abstract:

Abuse of tobacco like drug and alcohol is a worldwide public health problem. Cigarettes and other forms of tobacco contain the addictive drug nicotine. Nicotine is readily absorbed into the bloodstream when a tobacco product is chewed, inhaled or smoked. Upon entering the bloodstream, nicotine immediately stimulates the adrenal glands to release the hormone epinephrine (adrenaline). Epinephrine stimulates the central nervous system and increases blood pressure, respiration and heart rate. In India, it is estimated that 57% of the population aged 15 years and above use tobacco in one form or the other. 250 million kilograms of tobacco cleared for domestic consumption in India, 86% is used in the smoking form and 14% in the smokeless form which is major cause for cancer. The present study has been undertaken to estimate five popular Indian brands of Cigarettes and it was found that the brand Four Square contains comparatively more nicotine while Marlboro contains least.

Keywords:

Nicotine, Tobacco, Cigarettes

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