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## PHYTOCHEMICAL SCREENING OF METHANOLIC EXTRACT OF AERIAL PARTS OF *TREMA ORIENTALIS*

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**Abstract:** *Trema orientalis* is a small to medium sized tree belonging to Cannabaceae family. This species was a typical pioneer plant used in traditional medicine for the treatment of ailments in tropical regions, mainly in Asia. This species of *Trema* was often used to cure infections and fevers. It is commonly called as gun powder tree, Indian charcoal tree, Indian nettle, oriental Nettle and Pigeon wood. Although there were numerous traditional claims of the medicinal properties of the aerial parts of the plant, the reports of incidences of suspected toxicity in goats necessitated the studies on phytochemical constituents of *T. orientalis*. As per the information received regarding the incidences of the plant toxicity, the ailing goats had exhibited abnormal clinical signs such as in coordination, apathy, tenesmus and paddling movements. An experimental study was undertaken to assess the phytochemical constituents of *T. orientalis*. by using methanol as solvent for the extraction of aerial parts of the plant. The sieved plant powder was soaked in methanol at 1:5 ratio in glass containers for one week and then filtered and subjected to extraction using rotary evaporator. Finally obtained powdery extract was used for phytochemical screening tests. The distilled water was used as solvent for extract for some of the tests. All the tests were performed as per standard protocol using the chemicals and reagents procured from authenticated chemical manufacturers and results were recorded. The Physical characteristics, per cent yield were also estimated in which per cent yield was 12.38, greenish black colour and powdery consistency of extract were also found. The phytochemical screening of *T. Orientalis* revealed the presence of carbohydrates, starch, balsam, flavonoids, glycosides, phenolic compounds, phytosterols, triterpenoids, philobatannins, tannins, saponins and volatile oils, while the extract was negative for the presence of alkaloids, amino acids and protein. The phytoconstituents of the plant might play an important role in therapeutic and toxic properties.

**Keywords:** *Trema orientalis*, Phytochemical, Therapeutic, Toxic, Methanol

## POTENTIAL AVOCADO GROWING REGIONS IN INDIA: AN ECOLOGICAL NICHE MODELLING APPROACH

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**Abstract:** The present study aims to identify the suitable areas for avocado cultivation in India. The study employs ecological niche modelling techniques to identify the potential avocado growing regions based on various bioclimatic variables (19) such as maximum temperature of warmest month, precipitation of wettest month, precipitation of coldest quarter, precipitation of warmest quarter, mean temperature of warmest quarter, temperature annual range, temperature seasonality, isothermality etc. The MaxEnt algorithm was used to generate a model for avocado cultivation sites in India. The results indicate that the regions with the highest suitability for avocado cultivation are concentrated in the western, southern and northern parts of the country, with some potential areas in the northeast. The study also provides insights into the climatic and environmental factors that affect avocado growth and suggests possible strategies for avocado cultivation in India. This study can serve as a valuable guide for farmers and policymakers in identifying suitable locations for avocado cultivation and promoting the development of the avocado industry in India.

**Keywords:** Avocado, Bioclimatic variables, Cultivation, Germplasm

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## **PHYTOCHEMICAL SCREENING OF METHANOLIC EXTRACT OF AERIAL PARTS OF *CROTALARIA PALLIDA***

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**Abstract:** The genus *Crotalaria* belongs to the family Fabaceae which is the third largest genus of this family, containing approximately six hundred species widely distributed in tropical and subtropical regions of the world. The annual erect herb *Crotalaria pallida* Aiton is referred to as "rattlesnake," *C. pallida* is frequently used in traditional medicine to treat a wide range of ailments, including diarrhoea, diabetes, skin infections, snake bites, and urinary issues. An experimental study was undertaken to assess the phytochemical constituents of *C. pallida* by using methanol as solvent for the extraction of aerial parts of the plant. The sieved plant powder was soaked in methanol at 1:5 ratio in glass containers for one week and then filtered and subjected to extraction using rotary evaporator (hot extraction method). Finally obtained gummy extract was used for phytochemical screening tests. The distilled water was used as solvent for extract for some of the tests. All the tests were performed as per standard protocol using the chemicals and reagents procured from authenticated chemical manufacturers and results were recorded. The Physical characteristics, per cent yield were also estimated in which per cent yield was 3.702%, dark brownish green colour and gummy-sticky consistency of extract were also found. The phytochemical screening of *C. pallida* revealed the presence of alkaloids, flavonoids, phenolic compounds, tannins, phytosterols and triterpenoids, while the extract was negative for the presence of carbohydrate, amino acids and protein. The phytoconstituents of the plant might play an important role in therapeutic and toxic properties.

**Keywords:** *Crotalaria pallida*, Phytochemical, Therapeutic, Toxic, Methanolic extract, Aerial parts

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## **STABILIZATION OF BIOLOGICAL EFFICIENCY OF ISOLATES OF *VOLVARIELLA VOLVACEA* (BULL EX. FR.) SINGER THROUGH SINGLE SPORE CULTURES**

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**Abstract:** An experiment was conducted to stabilize the variable biological efficiency of *Volvariella volvacea* through single spore culture. Pure culture of *Volvariella volvacea* raised from tissue culture, multispore culture and monospore culture are studied for the radial growth, Biomass & Chlamyospore production, also studied for growth and yield parameters significantly highest yield (1.530 kg) & biological efficiency (21.86%) in single spore culture (SSI 3) found statistically at par with tissue culture of BYT VV-05 isolate with yield (1.410 kg) and biological efficiency (20.14%) significantly lowest Yield in multispore culture (0.900 kg/ bed) and (12.14%) biological efficiency was observed. Similar trends also observed on radial growth & biomass production culture of monosporous isolates (SSI 3) was found significantly highest radial growth (88.00 mm) and biomass production (0.420 gram) found statistically at par with tissue culture raised from JSP2 highest radial growth (84.40 mm) and biomass production (0.410 gram) isolate of *V. volvacea*.

**Keywords:** Radial growth, Biomass, Yield potential, Biological efficiency

## PREVALENT SILVIPASTORAL SYSTEM UNITS AMONG DIFFERENT FARMER CATEGORIES IN HIMACHAL PRADESH, NORTH WESTERN HIMALAYA, INDIA

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**Abstract:** The practice of agroforestry in Indian Himalayan state of Himachal Pradesh is as old as the agriculture itself. Farmers retain socially, ecologically and economically important trees, shrubs and herbs on their agroforestry land use systems for the multiple benefits they provides. Presently continuous expanding human and livestock population is leading huge pressure on nature and due to overuse of natural resources there are many incidences of natural disasters. Considering the tremendous scope of silvipastoral systems in improving productivity of degraded lands, livelihood of farming communities and in environmental security, present study was conducted in 12 representative villages of all four agro-climatic zones of Himachal Pradesh. Present study revealed that currently in Himachal Pradesh farmers are managing their silvipastoral land use systems traditionally and among all farmer categories marginal farmers were having more diverse system units 29, 16, 10 and 7 respectively in zone-I, II, III, IV whereas in small category 14, 10, 6, 2 and in medium category 3, 3, 2, 5 recorded in zone-I, II, III, IV respectively. Therefore considering the advantages of agroforestry, popularization of agroforestry through organizing mass scale unawareness programmes, distribution and plantation of improved and high yielding plant species along with technological interventions are urgently required for the utilization of full potential of existing silvipastoral systems.

**Keywords:** Agroforestry system, Farmers, Himachal Pradesh, Himalaya, Silvipastoral systems, System units

## COMPARATIVE ANALYSIS OF VERMICOMPOST QUALITY PRODUCED FROM RICE STRAW AND VEGETABLE WASTE EMPLOYING EARTHWORM *EISENIA FETIDA*

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**Abstract:** Soil health and crop production can be effectively maintained by using renewable biological resources, such as compost and vermicompost. With an annual production of nearly 87 mt of rice and 120 mt of paddy straw, rice (*Oryza sativa* L.) is the most important cereal crop in India. The majority of the paddy straw produced is used for roofing material, animal feed, fuel, and packaging and remainder is burned in the field. Paddy straw, however, is also not recommended as an animal feed because of its low protein content, weak palatability, high silica (11–25%) and lignin content (12%), as well as its low digestibility. The present study investigates the vermicompost preparation using paddy straw and vegetable waste along with biogas slurry in different proportions. Four treatments were selected having different ratios of paddy straw, biogas slurry and vegetable waste T1 (5:2:3), T2 (4:2:4), T3 (3:5:2) and T4 (2:3:5), respectively. The earthworm used for making compost was *Eiseniafoetida*. Preparation takes 84, 73, 66, 51 days for T1, T2, T3, and T4. During vermicomposting experiment, pH among all the treatments was decreased at the final stage as compared to the initial substrate. T3 showed highest increase in nitrogen content followed by T1, T2 and T4. The treatment T1 indicated highest initial and final potassium content. TOC reduction, as compared to initial level was in the order: T4 (49.06%)>T3 (35.28%)>T2 (27.73%)>T1 (17.84%). T3 although took 84 days but turned out to be best in terms of nutrients availability.

**Keywords:** Biogas slurry, NPK, Paddy straw, Vegetable waste, Vermicompost

## INTEGRATED MANAGEMENT OF LATE LEAF SPOT AND RUST DISEASES OF PEANUT (*ARACHIS HYPOGAEA* L.)

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**Abstract:** Groundnut or Peanut (*Arachis hypogaea* L.) is an important oilseed crop widely grown in major tropical and subtropical regions of the world. Late leaf spot (LLS, *Phaeoisariopsis personata*) and rust (*Puccinia arachidis*) are the two major biotic constraints in groundnut of global importance. Six isolates of *Bacillus subtilis* were isolated from the rhizosphere of groundnut using Nutrient Agar Medium. The effect of *Bacillus subtilis* isolates against foliar diseases of groundnut was studied under pot culture condition. From the results, it was found that *Bacillus subtilis* isolate *Bs1* was effective in managing the late leaf spot and rust diseases of groundnut. Hence, field experiment was conducted during 2021 and 2022 using the talc formulation of the effective isolate *Bacillus subtilis Bs1* for the management of foliar diseases of groundnut. The pooled mean results of the field experiments conducted during 2021 and 2022 revealed that seed treatment with *Bacillus subtilis* Bbv57 talc formulation @ 10 g/kg seed followed by foliar spray of Tebuconazole 50% + Trifloxystrobin 25% @ 1 g/l at 40 and 60 DAS was effective in managing the foliar diseases of groundnut with the late leaf spot (18.8 PDI) and rust (11.5 PDI) diseases. The maximum late leaf spot of 62.6 PDI and rust of 43.7 PDI respectively were recorded in the untreated control. In addition to disease reduction, the pod yield (2472 kg/ha) and haulm yield (2889 kg/ha) were found to be maximum in this treatment. In the untreated control, minimum pod yield of 1871 kg/ha and haulm yield of 2026 kg/ha were observed.

**Keywords:** Groundnut, Late leaf spot, Rust, *Bacillus*, Fungicides