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IN VITRO PROPAGATION OF POINSETTIA (*Euphorbia pulcherrima* Willd.)

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ABSTRACT

Poinsettia plants (*Euphorbia pulcherrima* Willd.) is a flowering potted plant with an high economic value, especially in Christmas and New Year. Conventional propagation of poinsettia by seed and cuttings has several limitations due to genetic variability and a low rate of propagation. This study presents the results of in vitro propagation for poinsettia. Nodal segments with axillary buds were sterilized with javel:distilled water at ratio 1:2 (v/v) in 15 minutes obtained 53.3% cleaned samples. Effect of 6-benzyladenine (BA), naphthalene acetic acid (NAA), gibberellin acid 3 (GA_3), indole 3- butyric acid (IBA) on in vitro shoot and root formation was studied. Full-strength Murashige and Skoog (MS) medium supplemented with 0.5 mg.L^{-1} BA and 0.1 mg.L^{-1} NAA was the best for shooting (4.8 shoots per explant). Shoots were transferred onto MS medium adding 0.3 mg.L^{-1} GA_3 for elongation within 4 weeks. The elongated shoots were rooted on half-strength MS medium containing 2 mg.L^{-1} IBA and plantlets were successfully acclimatized with 75% survival rate.

Keywords: BA, GA_3 , nodal segment, poinsettia, regeneration.

FUNGAL RESISTANCE OF PLYWOOD PRODUCED FROM BEECH VENEERS TREATED WITH N-METHYLOL MELAMINE COMPOUNDS AND ALKYL KETENE DIMER

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ABSTRACT

Rotary cut Beech (*Fagus sylvatica*. L) veneers with dimension of $1.5 \times 400 \times 400 \text{ mm}^3$ (rad \times tang \times long) were impregnated with three chemicals: N-methylol melamine (NMM-1 - 10% solid content), fatty acid modified N-methylol melamine/paraffin compound (mNMM-2 - 5% solid content), alkyl ketene dimer (AKD - 1% solid content). The impregnated veneers were pre-dried in a drying-oven at 40°C, 24 h to a moisture content of 3-8% before glue spreading. An amount of 160 g m⁻² PF glue was applied per veneer. Afterwards, 5-layer-plywood was produced in a hot press (130°C) at 1.5 MPa (10 min pressing time). The resistance against white rot fungus (*Pleurotus ostreatus*) and brown rot fungus (*Coniophora puteana*) of the plywood was performed according to the ENV 12038. The plywood treated with 10% solid content of NMM-1 solution disclosed high protection to the brown rot fungus *C. puteana* and the white rot fungus *P. ostreatus*. While the treatment of veneers with 5% mNMM-2 and catalyst RB (an aluminium salt) imparted medium resistance to plywood against *P. ostreatus* and no resistance to *C. puteana*. The veneer treatment with 1% solid content of AKD totally failed to protect plywood from the brown rot fungus *C. puteana* and the white rot fungus *P. ostreatus* after 16 weeks of incubation.

Keywords: alkyl ketene dimer, beech veneer, fungal resistance, N-methylol melamine.

UTILIZATION OF RICE STRAW IN THE WORLD AND IN VIETNAM

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ABSTRACT

This paper reviews the utilization of rice straw in the world, including the production and properties of straw, different equipment for gathering and processing of straw as related to the costs in handling operations, and various methods of using straw - from simple ways such as cattle feeding or organic fertilizers, to more complicated ways such as using straw in electrical power generation or paper industry. Straw utilization in Vietnam is presented in parallel, with emphasis on identifying problems to be studied and verified versus other results in the world.

Keywords: *rice straw; straw equipment; baler; straw utilization; Vietnam.*

ESTABLISHMENT OF A PROCESSING PROCEDURE FOR MANUFACTURING DRIED DRAGON FRUIT

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ABSTRACT

In recent years, consumption of dragon fruits became an issue because of the dramatic increase in domestic production and the production in other countries. So it becomes urgent to develop new products, which can utilize the abundant amount of fresh dragon fruit, and provides a sustainable output for the domestic production. In the present study, we preliminarily developed a processing procedure to manufacture dried dragon fruit. The objectives of the study were (1) to determine if it is advantageous to do osmotic dehydration (OD) before hot air drying, (2) to find out a suitable submerging time if OD was necessary, and (3) to evaluate stability of the product during storage with or without using sodium bisulfite. The results showed that application of OD with a solution of 50% sucrose and 1.5% citric acid led to 6.58% higher in product yield, 8.08% lower in volume contraction, and 3 hours shorter in subsequent hot-air drying. The use of sodium bisulfite by submersion of sample in 0.5 % solution before processing was necessary to prevent the growth of mold and maintain sensorial quality (especially color) of the dried product. The processing procedure developed from this study can be implemented in industry.

Keywords: *dried dragon fruits, drying, osmotic dehydration, drying curves.*

STUDY ON EXTRACTION AND ANTIOXIDANT ACTIVITY OF ESSENTIAL OIL OF COLEUS AUROMATICUS

(Plectranthus amboinicus)

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ABSTRACT

The factors affecting oil yield and antioxidant activity of essential oil from Coleus auromaticus (Plectranthus amboinicus) were analyzed. The physicochemical characterisation of raw materials and essential oils were also evaluated. For fresh sample, the optimum condition for extraction was 7 hours and ratio 1/1 (w/v) for the extraction time and the material/solvent ratio, respectively. For the sample with of 5% of the wet based water content, the optimum condition was 2.5 hours and ratio 1/18 (w/v) for the extraction time and the material/solvent ratio, respectively. The gas chromatography analyses revealed the presence of γ -terpinene (18.69%), caryophyllene (17.95%), and humulene (4.61%) and trans-alpha-bergamotene (10.28%) in essential oil. The ability to trap free radicals of the oil was shown by the IC50 value of 3762 $\mu\text{g} / \text{ml}$ by DPPH (2,2-diphenyl-1-picrylhydrazyl) test.

Keywords: essential oil, Coleus auromaticus, distillation, Plectranthus amboinicus, P. amboinicus

INDOOR/OUTDOOR PARTICLE NUMBER CONCENTRATIONS UNDER CONDITIONS OF VEHICLES AND METEOROLOGY

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ABSTRACT

The intermittent particle concentration measurements were conducted in an apartment including three bedrooms on the fourth floor of a building 50-m away from the center of a busy road. There were no people and pet living in the study apartment during study periods. Two bedrooms were chosen for this study. One room (R1) has a window directly facing the road. Another room (R2) has a window facing the street directly through a space of about 1 m. Number concentration and size distributions of particles (15.7-661 nm) were determined by using a system of TSI Scanning Mobility Particle Sizer. Larger particles were determined by using a TSI Aerodynamic Particle Sizer model 3321 (0.5-20 μm). The study results showed that traffic volume, wind speed and direction were key factors affecting outdoor and indoor pollutant number concentrations. The average outdoor, R1 and R2 particle number concentrations were 19322, 7785, 1967 particles/ cm^3 , respectively for particles of 15.7-661 nm and 288, 132, 33 respectively for particles of 0.5-20 μm . Peak indoor and outdoor particle number concentrations occurred as high traffic volume and the apartment located downwind as well as under calm wind conditions. Indoor/outdoor particle number concentration-based ratios of particles ranging sizes of 15.7-661 nm and 0.5-20 μm are 0.70 ± 0.30 and 0.84 ± 0.28 , respectively at R1 and those were 0.14 ± 0.05 and 0.15 ± 0.05 , respectively at R2. The bedroom with the window not facing the road directly was less affected than the bedroom with the window facing the road.

Key words: Apartment, Indoor/outdoor particle concentration, Meteorology, Vehicle.

ASSESSING THE AGRICULTURAL BIOMASS AND ORIENTATION FOR BIOENERGY DEVELOPMENT IN CHU SE DISTRICT, GIA LAI PROVINCE

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ABSTRACT

The study evaluates the amount of crop residues and their ability to turn into energy, suggesting the use of agricultural waste in Chu Se district for the cogeneration process. The rate of using waste burning in the field accounts for the highest rate of 52.93% followed by the use of waste to make fertilizer accounted for 39.80%. By using the method of estimating residue-to-product-ratios and calorific value of Thailand crop residues and using a 0.536 efficiency furnace; the results show that if the total amount of waste from rice, maize, peanut and coffee is collected and used for electricity generation, the total electricity generated from waste products in the whole district of Chu Se is about 580097 GJ/year equivalent to 161137.978 MWh/year. This is a very useful result for policy makers and managers in general and the environment in particular.

Keywords: *Crop residues, Biomass, Residue-to-product ratio, Agriculture.*

PROPOSING A BETTER MANAGEMENT REGIME FOR HARD CLAM (*Meretrix lyrata*) FARMING IN TIEN GIANG PROVINCE, VIETNAM

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ABSTRACT

*The objective of this study was to assess the management status of hard clam (*Meretrix lyrata*) farming practices in Tien Giang province in order to propose a better management package for more sustainability of this industry. A number of methods were used for data collection including document reviews, group interviews with local stakeholders such as farmers and managers. A SWOT analysis was used as a basis for proposing a better management model for the industry, and the proposed model was then evaluated by experts and experienced farmers. Finally, the model was adjusted to be more applicable to the real situation. This paper is going to present the strengths and weaknesses of the current management of hard clam industry at the studied area, focusing on its efficiency in terms of constitutional and economic views. Then a new management model for this hard clam industry was proposed by combining its current strengths and successful experiences learnt from other provinces such as Ben Tre, where a successful hard clam industry obtained a Marine Stewardship Council (MSC) certificate. Results from the evaluation by experts and farmers show that the proposed management model for hard clam industry in Tien Giang was highly applicable in terms of its suitability and promising positive impacts on the environment, economic and social aspects. In addition to the evaluation, some measures for risk elimination have been suggested to ensure that the proposed management model would achieve its goals.*

Keywords: *hard clam farming, Tien Giang, proposing management model.*

EFFECTS OF DIETARY SUPPLEMENTATION OF ORGANIC TRACE MINERALS ON GROWTH PERFORMANCE OF NURSERY PIGS

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ABSTRACT

The experiment was conducted to evaluate the effects of dietary supplementation of organic trace minerals (Availa-Starter 123®) on growth performance of nursery pigs. One hundred and eighty crossbred weaned pigs [(Yorkshire-Landrace) x Duroc; 28 d old; 7.45 ± 0.90 kg of BW] were randomly allotted to 2 treatments in a randomized complete block design. The 2 experimental treatments included (1) basal diet with inorganic trace minerals (Control) and (2) As 1 + 0.175% Availa-Starter 123. Pigs were blocked by their initial body weight. Sex and ancestry were equally distributed across treatments. There were 15 pigs/pen and 6 replicate pens/treatment. The ADG of pigs fed the Availa-Starter 123-supplemented diet (368.2 g) was greater than ($P = 0.021$) that of pigs fed the control diet (345.3 g) during the experimental period. The Availa-Starter 123 increased ($P = 0.020$) the final BW of pigs (18.14 kg/pig) when compared with the control (17.55 kg/pig). The diet supplemented with Availa-Starter 123 did not affect ADFI and F:G of pigs as compared with the control ($P > 0.05$). No differences in the mortality, incidence of diarrhea, and number of antibiotic treatments between the two treatments were found ($P > 0.05$). Briefly, addition of Availa-Starter 123 to a commercial nursery diet containing inorganic trace minerals improved the growth performance of pigs as it increased the ADG and final BW of pigs.

Keywords: growth performance, nursery pigs, organic trace minerals

EVALUATION OF ANTIBIOTIC RESISTANCE OF GRAM – NEGATIVE BACTERIA ISOLATED FROM DONG NAI RIVER

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ABSTRACT

*This study assessed the current status of antibiotic resistance of Gram-negative bacteria on Dong Nai–Saigon river. Water samples were collected from 4 different areas on the river including: Nam Cat Tien forest, La Nga district (Dong Nai province), Sai Gon river (HCMC) and Can Gio district (Ho Chi Minh city). Sampling sites are close to large aquaculture areas, ranging from upstream to downstream of the river. The results showed that 20 strains of Gram negative bacteria, which belong to five bacterial species, were identified: *Vibrio sp*, *Serratia sp* *Enterobacteriaceae sp*, *Pseudomonas sp* and *Escherichia coli*. Sensitivity to antibiotics was determined with four common antibiotics used in aquaculture including Ampicillin, Amoxicillin, Chloramphenicol (CHL), Tetracycline (TET) and Kanamycin (KAN). AMP antimicrobial resistance was highest (55%), and lowest was TET (25%). Most isolated strains (80%) were resistant to at least one antibiotic, of which 3 were resistant to all antibiotics. Antimicrobial resistance rates in the five-isolated species have shown greater concern needed for the protection of the environment and human health, particularly the antibiotics used in agriculture and aquaculture activities.*

Keywords: *Dong Nai river, Antibiotic resistance, Gram-negative bacteria, Ampicillin, Amoxicillin.*

DETECTION OF RIEMERELLA ANATIPESTIFER AND ESCHERICHIA COLI IN DUCKS AND DUCK POND WATER IN LONG AN PROVINCE

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ABSTRACT

In Long An province and other places, ducks at 3-8 weeks of age often experience a syndrome including greenish diarrhea, eye and nose discharge, shaking head and trembling, which is considered to be related to Riemerella anatipestifer and Escherichia coli infection. There was not any study to prove this hypothesis. For that reason, this study was conducted as the first step to investigate the cause(s) of this syndrome. In total, 70 throat swab samples from sick ducks with typical clinical signs and ducks with no clinical signs, and 27 duck pond water samples from 27 duck farms were collected for examination of R. anatipestifer and E. coli by PCR. Two PCRs, one targeting the 16S rDNA and the other on the gyrB gene of R. anatipestifer and one PCR of phoA gene in E. coli were used. Although the results from the two PCRs for R. anatipestifer were variable, it was showed that R. anatipestifer was detected on both diseased and non-diseased ducks, and in duck pond water samples. E. coli was found in samples taken from ducks with and without clinical signs and in all pond water samples.

Keywords: *Riemerella anatipestifer, diarrhea, shaking head, trembling*