Use of essential oils for the control of post harvest decay in citrus

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Post harvest decay of perishables is mostly controlled through application of pesticides. However contamination of edibles due to pesticide residues and developing resistance in pathogens has necessitated the search of alternative environment friendly strategies. Plant products are considered as a major source of novel chemotherapeutics that can be used in plant protection. Plant essential oils are volatile compounds so can provide an active packaging material for perishable food items. The present study was designed to evaluate (in vitro and in vivo) antifungal activities of the essential oils obtained from Cumin seeds, Clove buds and Cinnamon bark against Penicillium italicum that is the causal agent of blue mold disease in citrus fruit during storage. Different concentrations (3, 6, 12, 24 and 48 μl/mL) of selected essential oils were checked for their potential to inhibit the mycelial growth of the test fungi. Overall various assays confirmed the potential of tested essential oils for their antifungal activity which varied with type and concentration of oil used. The in vitro study revealed that the essential oils of cumin and clove have the potential to inhibit mycelial growth of test fungi completely at concentrations of 12 and 48μl/ml respectively. Essential oil of cinnamon, however failed to completely inhibit the mycelial growth even at maximum used concentration of 48μl/ml. In vivo assays also support these outcomes. Clove and cumin oils when applied on citrus fruits, showed total fungal inhibition at concentration of 24μl/ml and 48μl/ml respectively. Whereas, cinnamon essential oil could not prevent fungal infection even when used in highest tested concentration. The study was also extended to the identification of active components of the three oils.

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Antibody mediated rejection of the pancreas allograft: Diagnosis, incidence, risk factors, and outcomes

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Antibody mediated rejection (AMR) after pancreas transplant is a recently identified entity. We describe the incidence of, risk factors for, and outcomes after AMR, and the correlation of C4d immunostaining and donor specific antibody (DSA) in the diagnosis of AMR. We retrospectively analyzed 162 pancreas transplants in 159 patients between 8/1/2006-12/31/2009 and 96 pancreas transplant biopsies. Univariate and multivariate analysis was performed to look at risk factors for antibody-mediated pancreas rejection. 1-year rejection rates and outcomes after rejection were calculated by Kaplan-Meier methods. AMR occurred in 18% (n=26) of patients by 1 year post transplant. Multivariate risk factors for AMR include non-primary simultaneous pancreas kidney transplant (SPK), primary solitary pancreas transplant, and race mismatch. After pancreas rejection, patient survival was 100%. Graft survival after ACR, AMR, and mixed rejection was similar. 20% (8 of 41) of grafts failed within 1 year post rejection. We demonstrated a significant correlation between the presence of inter-acinar capillary staining with donor specific antibodies and allograft dysfunction (p<0.01). Of biopsies that stained >5% C4d, 80% had increased class I DSA. AMR occurs at a measurable rate after pancreas transplantation and is more common after non-primary SPK and primary solitary pancreas transplantation when compared to primary SPK transplants. When AMR is treated specifically, outcomes are similar to ACR. C4d and DSA are helpful in diagnosing AMR.

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