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Research Article **Published Date:-2017-08-08 00:00:00**

Effects of Vochysia haenkeana extract on the neuromuscular blockade induced by Bothrops jararaca venom on chick biventer cervicis preparation in vitro

Vochysia haenkeana extract (Vh-E) was assessed against the neuromuscular blockade induced by Bothrops jararaca venom on chick biventer cervicis (BC) preparation. Pre- and post-venom incubation treatments (Pre-vit and Post-vit) were analysed here. Contractures ACh (110 µM) and KCl (20 mM) were evoked before and after addition of venom without stimulation. Vh-E (600 µg/mL) under Pre-vit was more efficient to neutralize the neuromuscular blockade by venom (40 µg/mL) [72.5±4.6% (venom) vs. 45.2±14% (Vh-E) of blockade, $p<0.05$, n=4]. Vh-E (600 µg/mL) did not cause significant changes under Post-vit [72.5±4.6% (venom) vs. 63.4±8.2% (Vh-E) of blockade, n=4]. The Pre-vit inhibited the blockade of the contracture to ACh (106±17% of response; n=4) while the Post-vit was able to attenuate the effect of the venom on this contracture (55±5% of response; n=4); related to those contractures to KCl both of treatments with Vh-E attenuated the blocker effect of the venom (62.5±7.7% and 55±5% of response for Pre-vit and Post-vit, respectively; n=4). In conclusion, Vh-E neutralizes partially the neuromuscular blockade in Pre-vit, an effect that can be related to preserved function of “extrinsic” post-synaptic receptors, by measured contractures in response to ACh. The myotoxicity of the venom was significantly reduced by Vh-E in both, Pre-vit and Post-vit, by measured contractures in response to KCl.

Research Article **Published Date:-2017-06-12 00:00:00**

Wild-type Agrobacterium rhizogenes-mediated gene transfer in plants: Agrobacterium virulence and selection of transformants

Agrobacterium rhizogenes ATCC 15834 wild type strain was transformed with the binary vector pBI121 using the heat shock method. The transformed Agrobacterium was then tested for virulence through tobacco leaf explant transformation. Compared to the non-transformed Agrobacterium, the transformed Agrobacterium showed reduced virulence, producing significantly lower number of hairy roots in tobacco leaf explants. Although the transformed Agrobacterium showed reduced virulence, it was able to transfer the T-DNA of the binary vector into the plant genome, resulting in stable GUS expression in the generated hairy roots. This indicated that in addition to the transfer DNA (T-DNA) from its root inducing (Ri) plasmid, the transformed Agrobacterium is also capable of transferring the binary vector T-DNA and allowing the integration of a foreign gene. Results also showed that hairy root generation efficiency of the transformed Agrobacterium varied with the concentration of the selection agent (kanamycin). Hairy root generation efficiency (hairy roots·explant-1) progressively increased with decreasing concentrations of kanamycin; and the efficiency was highest in the absence of kanamycin. Generated hairy roots showed very strong to tiny GUS expression even those that grew under the highest concentration of the kanamycin (50 mg·L-1). This indicated that co-transformation and efficient transgene expression does not always occur.

Mini Review **Published Date:-2017-06-02 00:00:00**

Antagonistic features displayed by Plant Growth Promoting Rhizobacteria (PGPR): A Review

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Soil dwelling bacteria able to colonize plant roots and closely associated soil are referred to as rhizobacteria. A wide range of rhizobacteria has the ability to promote plant growth directly by producing phytohormone and nutrients; and indirectly by controlling plant pathogen. These beneficial bacteria are known as plant growth promoting rhizobacteria (PGPR). PGPR control phytopathogens by producing chemicals that could damage pathogen cells, removing pathogen specific nutrients from the environment, or inducing resistance against pathogen in plant body. Antagonistic bacteria specifically damage pathogens by producing lytic enzymes, antibiotics and bacteriocins; and excluding pathogen from plant environment by siderophores oriented iron chelation. This review highlights the antagonistic feature of PGPR. Application of antagonistic bacteria as biopesticides is an attractive alternate of chemical pesticides. Chemical pesticides are non-targeted and cause pollution during its synthesis as well as at the site of application. Antagonistic bacteria could be used as biopesticides and biofertilizers for better plant health and growth improvement.

Research Article **Published Date:-2017-05-23 00:00:00**

Phytochemical content of leaf and stem of Marsilea quadrifolia (L.)

The present study was aimed to screen and quantify the phytochemicals by qualitative and quantitative analysis in methanol and aqueous leaf and stem extracts of Marsilea quadrifolia(L.). In qualitative analysis, the phytochemical compounds such as tannins, saponins, flavonoids, steroids, terpenoids, triterpenoids, alkaloids, carbohydrates, proteins, anthroquinones, phenolic compounds and phytosterol were screened. Among these phytocompounds tannins, saponins, flavonoids, steroids, alkaloids, carbohydrates, proteins and phenolic compounds were observed in methanol and aqueous leaf and stem extracts of M. quadrifolia. Anthroquinones were absent in both leaf and stem extracts of M. quadrifolia. The content of phenolic compounds 8.34±0.92 mg/g and 7.31±0.46 mg/g, flavonoids 7.46±0.64 mg/g and 6.45±0.68 mg/g, alkaloids 6.12±0.51 mg/g and 5.89±0.61 mg/g, tannins 6.58±0.72 mg/g and 6.07±0.56 mg/g and saponins 5.32±0.48 mg/g and 6.30±0.58 mg/g were determined in leaf and stem of M. quadrifolia, respectively. So, the present study confirmed that the presence of phytocompounds in leaf and stem of M. quadrifolia.

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The Effects of Pharmacological Carbonic Anhydrase Suppression on Defence Responses of Potato Leaves To Phytophthora Infestans

In this study we proposed carbonic anhydrase (CA) as an important element of basal resistance during the potato (Solanum tuberosum L.)-Phytophthora infestans interaction. We found a different ?-CA expression pattern in incompatible vs. compatible systems correlated in time with CA enzyme activity. Resistant potato leaves supplied with dorzolamide (an inhibitor of carbonate CA activity) and challenged with the pathogen showed an elevated nitric oxide (NO) synthesis, which was the most evident during the early phase of NO burst (at 3 hpi) during hypersensitive response (HR). In vitro application of dorzolamide and effective inhibitors of NO synthesis confirmed the implication of CA activity in NO metabolism during potato defense. To clarify how suppression of CA carbonate activity translates into the complexity of NO-related responses leading to potato resistance or susceptibility to an oomycete pathogen we analysed expression of NPR, PR1, and PAL.

Taken together, pharmacological damping of CA activity revealed a functional link between CA and NO-dependent signaling in potato defense against P. infestans manifested by accelerated NO formation and a modified salicylic acid defense pathway. The dorzolamide-mediated effective responses for basal resistance also delayed symptoms of late blight in the susceptible potato cultivar, without overcoming HR formation in the resistant one.

Research Article **Published Date:-2017-02-21 00:00:00**

Impact of Calcium Phosphate Nanoparticles on Rice Plant

Calcium phosphates are of great interest in medicine, biology, agriculture and materials sciences. The present study evaluates the effect of calcium phosphates nanoparticles on biochemical changes in rice. Nanoparticles increased the growth rate and affect the physiology of the plant. Calcium phosphate nanoparticles may help in the formulation of new nano growth promoter and nano-fertilizers for agricultural use. Therefore, it could potentially help in reduction of the quantity of fertilizer applied to crops and contributing to precision farming as it reduces fertilizer wastage and in turn environmental pollution due to agricultural malpractices. However, detail physiological and molecular understanding of its impact on rice crop plant is needed in future to validate its prospective application in agriculture.