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A SHORT REVIEW ON CALLUS STUDIES OF *CANTHIUM PARVIFLORUM* LAM.

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ABSTRACT

Medicinal plants still remains as thriving source of life-saving drugs for the large majority of people treating health problems. The medicinal value of a plant lies in some chemical substances that produce a definite physiological action on the human body. Although very few plant cell processes are operating commercially, the most successful commercial pharmaceuticals produced from undifferentiated cell cultures are anti-biotic compounds. The present study review on callus extracts of *Canthium parviflorum* has showed very potent comparatively with wild plants. Hence, this study is needful to be isolated, characterized and carries out further pharmacological evaluation.

INTRODUCTION

The World Health Organization (WHO), traditional medicines are relied upon by 65-80% of the world's population for their primary health care needs (Plengsuriyakarn *et al.*, 2012). Nature has been a source of medicinal compounds for thousands of years and an impressive number of modern drugs have been isolated from natural sources mostly based on their use in traditional medicine. Susruta and Charaka-samhita, the two most ancient and important divisions of Ayurveda written about 1000 B.C. means knowledge of life, contain surgery, therapeutics, medicine and materia medica. Drug discovery from medicinal plants comprise a multifaceted approach of combining Botanical, Phytochemical, Biological, and Molecular techniques. Effectiveness of the natural products, mainly the herbal extracts with their proven potential and negligible side effects in therapeutics, has already replaced the synthetically derived chemical substances as in modern allopathic medication system which is regarded as risky to human and environment (Sakthivel *et al.*, 2012). In Various medicinal plants have been used from time immemorial in daily life to treat diseases all over the world. Herbal medicines contains one or more herbal substances as active ingredients which is derived from the aerial and non-aerial parts, juices, resins, and oils of the plant either in crude state or as pharmaceutical formulation (Barboza GE *et al.*, 2009).

Callus Culture Studies

Callus culture is mainly used for the production of secondary metabolites, protoplast culture, cell culture, cryopreservation and genetic manipulation in the production of transgenics and in indirect plant regeneration. Although cell cultures offer a suitable biological system in a controlled environment wherein the morphogenic events can be maintained and regulated by growth regulators in the nutrient medium in a rapid productions of plant metabolites of pharmaceutical value (Arumugam *et al.*, 2011).

Based on Previous reports *Canthium parviflorum* callus from leaf explants cultured on MS medium supplemented with various auxins (2, 4-Dichlorophenoxyacetic acid (2, 4-D), α -Naphthalene Acetic Acid (NAA) and Indole Buteric Acid (IBA), cytokinins (6-Benzyladenine (BA) Kinetin (KN) and cytokinin-auxin combination (BA+NAA) in different concentrations (0.5 to 5.0 mg/l) were used. BA 1mg/l, in combination with NAA (1.0 mg/l) also produced maximum amount of callus.^[19]

Phytochemicals

The secondary metabolites, especially the bioactive compounds present in the plants, provided the basis for several sophisticated traditional medicine systems like Ayurveda, Unani, and Folk. Phytomedicines such as aspirin, vincristine, vinblastine, cocaine, digitoxin, quinine, and morphine are still in used to treat or prevent various disorders (Sahoo *et al.*, 2010). Several group of phytochemicals such as alkaloids, steroids, terpenoids, essential oils, and phenolics from different plants have been reported previously for their insecticidal activities. The preliminary phytochemical analysis shows that the plant is rich in chemical bases as steroids, phenolic compounds, tannins and saponins.

Kala *et al.*, 2012 reported the qualitative phytochemical analysis of *Canthium parviflorum* leaf callus extracts revealed in various solvents presence of secondary metabolites like terpenoids, saponins, steroids, tannins, quinines and gums.

Antimicrobial activity

Plants are considered as a reliable source for the discovery of novel antimicrobial agents (Rangasamy *et al.*, 2007). Due to increasing resistance of bacteria to antibiotics there is an increasing demand of new antimicrobial agents from plants, researchers have also been conducted to validate the traditional therapeutic value of the plants as well as to discover its antimicrobial activity. Many reports show the effectiveness of traditional herbs against microorganisms; as a result plants are one of the bedrocks for modern medicine to attain new principles. Previously reported the *Canthium parviflorum* leaf callus extracts exhibited potent antibacterial activity against both gram positive and negative bacteria, exactly the chloroform and methanol extracts showed high zone of inhibition and also showed high potent activity against few fungal species. (Kala *et al.*, 2015) Based on the previous reports, results indicated the callus extracts of *Canthium parviflorum* has potent antibiotic compounds which need to be isolated, characterized and screened.

Pharmacological screening

A large number of medicinal plants still remain to be investigated for their possible pharmacological values. The chemical constituents of plant may help as cofactors for already available biologically active compounds (Nahrstedt *et al.*, 2010).

Kala *et al.*, 2014 reported though the callus extract of *Canthium parviflorum* has callus extracts do not contain potent antioxidant, α -glucosidase, hypocholesteromic and tyrosinase inhibition activities. In addition to this, the *Canthium* plant extracts also showed anti-inflammatory activity and cytotoxic activity also. *Canthium parviflorum* chloroform callus extract has shown remarkable cytotoxicity. It is likely that anti-cancer activity of this plant extract might be attributed to anti-oxidant activity. On the basis of the above results it was evidenced that the *Canthium parviflorum* callus extract possess significant cytotoxicity. The results obtained in this study provide scientific information that could aid in the isolation of potential pharmacologically active compounds from some of these medicinal plants in future research. Recent evidences from the pharmaceutical companies' shows that some complex diseases, natural products still represent an extremely valuable source for the production of new chemical entities. So, cell suspension culturing is considered one of the best approaches for studying the biosynthesis of natural products, and calli are the richest sources of cell mass when establishing such cultures (Khafagi, 2003, Edeoga, 2005).

CONCLUSION

A large number of medicinal plants still remain to be investigated for their possible pharmacological values. In the past few decades, secondary metabolite production from plant tissue culture has been identified as a tremendous resource for new drug development and clinical research in the fields of pharmacology and medicine.

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