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A novel anti-bacterial and antifungal protein from *Euphorbia hirta*

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In recent years, there has been sudden increase in bacterial and fungal infections mainly due to infection caused by opportunistic and drug-resistant pathogens particularly in immuno-compromised host and patients who has gone for transplant surgery. A therapeutic molecule with inherent properties of both antimicrobial as well as immuno-modulatory activity will be more effective in controlling and treating the antimicrobial infections in general and in immuno-compromised hosts in particular. As such, novel molecules will have dual action; the first is by killing the pathogen and secondly by boosting the immune system of the host. But finding such molecules is a difficult task. However, the observation that several antimicrobial proteins/peptides besides their antimicrobial action also found to have imuno-modulatory effects provide strong basis that such proteins do exist in nature. Keeping this fact in mind, an attempt has been made in the present study to search for such a novel protein from *Euphorbia hirta* a well-known medicinal plant. A novel protein with antimicrobial and immuno-modulatory activities has been isolated and purified from *E. hirta* leaves. Characterization of purified protein by different biochemical methods (SDS PAGE and HPLC) and biophysical methods (N-terminal sequencing, and mass spectrometric technique, revealed that it is 53 kDa monomeric proteins. It found to have potent antimicrobial and immuno-modulatory activities as confirmed by various standard assays, TEM and SEM and *in vitro* and *in vivo* studies. Attempt was made to identify the protein using bioinformatics tools. The results and finding will be presented and discuss.

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