DETECTION AND CHARACTERIZATION OF BIOLOGICALLY ACTIVE MOLECULES WITH INSECTICIDAL AND ANTIMICROBIAL ACTIVITY IN SOAPBERRY (Sapindus saponaria) PLANTS

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Introduction: Soapberry (Sapindus saponaria) belongs to the Sapindaceae family, it is a widely studied plant due to the presence of various biologically active molecules. It has been demonstrated that some of these molecules are produced in response to pest and pathogen attacks. Objective: The present study aims to evaluate the antimicrobial and insecticidal potential of soapberry plants, and characterize the defense mechanism involved in the production of cystatins in response to injury and methyl jasmonate treatment. Methodology: Fungal growth of Trichoderma viride in presence of soapberry leaf extract (1%, 5% and 10% v/v) was evaluated for 7 days. These same concentrations of extract were used to evaluate its larvicidal potential on 4º instar larvae of Aedes aegypti for 48 hours. In parallel, soapberry seedlings were subjected to mechanical wounding and treatment with methyl jasmonate for 24h. Plants were then subjected to extraction of leaf proteins, which were analyzed for the presence of protease inhibitors. Results: In antifungal assays, the presence of concentrations higher than 5% extract resulted in a total fungal growth inhibition. Preliminary results suggest the potential extract is larvicide even at low concentrations (1% v/v) leading to mosquito larvae mortality. The leaf extracts treated with methyl jasmonate vapours and mechanical injury inhibited papain catalytic activity by ~70% indicating the production of a putative cystatin on soapberry leaves. In addition, a ~40kDa protein reacted with the polyclonal antibody raised against tomato cystatin, corroborating the results obtained in the papain inhibition assay. Isolation of biologically active molecules is in progress. Conclusion: Soapberry ethanol extracts have fungicidal and larvicidal activity. Mechanical wounding and methyl jasmonate treatment results in an increased synthesis of a putative cystatin in soapberry leaves.

Keywords: Soapberry, phytocystatin, antimicrobial activity

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