

Extended Abstract

Clove Buds Affect MCF-7 Breast Cancer Cell Stress/Survival Pathways and Induce Oxidative Stress, DNA Damage, Cell Cycle Arrest, and Apoptosis [†]

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1. Introduction

Breast cancer is reportedly the second most diagnosed cancer worldwide. Several recent epidemiological studies revealed that long-term consumption of plant-derived functional foods is linked with a decreased risk of breast carcinoma. A plethora of studies demonstrated that phenolics, carotenoids, and other plant chemicals display anticancer and several other biological activities, for example antioxidant, anti-inflammatory or immunomodulatory. In this study, the anticancer effects of cloves in the *in vitro* mammary carcinoma model were assessed.

2. Methods

Flow cytometry, fluorescence microscopy, western blot and life cell imaging techniques were used to study apoptosis mechanisms and signaling pathways involved after cloves treatment.

3. Results

We demonstrated that clove buds showed anti- and pro-oxidant properties in a time- and dose-dependent manner, followed by SOD modulation, DNA damage, S-phase cell cycle arrest, and apoptosis induction. Moreover, cloves affected stress/survival signaling pathways such as p38 MAPK, Erk 1/2, Akt, and JNK in the MCF-7 breast carcinoma model.

4. Conclusions

Our data demonstrated that clove treatment suppressed breast cancer cell proliferation, induced oxidative stress changes, affected several proteins involved in survival pathways, and led to programmed cell death in MCF-7 cells.

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