

Bioactivity of *Viscum album* extracts from Olive and Almond host plants in Palestine

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ABSTRACT

Introduction: *Viscum album* is a semi-parasitic medicinal plant which has been used for many years as a remedy in traditional medicine. The plant is widely used in folk medicine in Palestine; mainly in the treatment of cancer, diabetes and heart disease. Since no previous reports on bioactivity of this plant in association with host plant specificity in Palestine, the current study aimed at evaluating bioactivity of almond and olive variants of this plant. **Method:** Methanolic extract of *viscum album* cultivated from almond and olive host plants were tested for antioxidant, antimicrobial. Prothrombin time (PT) and activated partial thromboplastin time (aPTT) were also used to assess anticoagulant activities of plant extracts. **Result:** The result demonstrated that *Viscum album* have an IC_{50} of $25.34 \pm 3.8 \mu\text{g/ml}$ when hosted by olive while the IC_{50} was $15.37 \pm 2.2 \mu\text{g/ml}$ when hosted by almond. Crude extracts of both *Viscum album* plants showed strong inhibition effects on the growth of the studied *Staphylococcus aureus* strains (ATCC 25923 and MRSA) with a pronounced effect when extracts of almond host was used. However, the effects of both host extracts were very limited or absent when tested against Gram-negative reference and clinical strains. Plant extracts of both host showed prolonged PT and PTT compared to phosphate buffered saline control solution. **Conclusion:** In conclusion, variations in the bioactivity of *Viscum album* is clearly influenced by host type and further studies required to illustrate such variations using other host plants.

Keywords: *Viscum album*, Antioxidant, Prothrombin time, Antimicrobial.

INTRODUCTION

Complementary and alternative medicine (CAM) has become increasingly popular for various conditions and diseases over the last decades. Most of these complementary treatments are herbal remedies and among these is *Viscum album* (Mistletoe) extracts.^[1] A number of biological effects were reported for *Viscum album* including anti-cancer, apoptosis-inducing, antimycotic, antibacterial, antiviral, antidiabetic, and immunomodulatory activities have been reported.^[2]

Viscum album is a small, dioecious and shrubby semi-parasitic plant that grows wild on trees, bushes and other plants.^[3] It has an oblong evergreen leathery leaves, clear dichasial branching and four-part flowers which form white sticky berries with a faint but characteristic odor and a bitter taste.^[4] Mistletoe is considered a semiparasitic plant because it synthesizes its own chlorophyll but depends on the host for its supply of water and minerals.^[5]

Recent scientific research has confirmed that *Viscum album* extract induced apoptotic killing of cultured human tumor cells and lymphocytes, and stimulated the immune system^[6-9] so that, it affects positively on the lifespan of individuals respectively.^[10]

The phytochemical profile of mistletoe depends of the host trees of this plant.^[11] The main bioactive compounds found in mistletoe are lectins, viscotoxin, flavonoids, as well as acidic arabinogalactan.^[12-14] The alkaloid

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