

Phytochemical Screening and In-vitro Evaluation of Antioxidant and Antimicrobial Activities of the Entire Khella Plant (*Ammi visnaga*.L.)

Jaradat Nidal Amin, Abuhasan Murad, Al-Masri Motasem, Speih Reem Ibrahim, Johari Mona Ass'ad, Awad May Ayed

Abstract

Objectives: In the developing countries, a large number of people depend on the traditional folk medicine as primary substances in their healthcare systems especially rural areas healers and patients from centuries. An estimated 35,000 to 70,000 plant species are used for medicinal and therapeutic purposes in the world. The objectives of this study were to screen the phytochemical constituents and antibacterial activities also to evaluate antioxidant property of the *Ammivisnaga*(L.) Lam. entire plant.

Methods: The *Ammi visnaga* plant was phytochemically screened (acetone, methanolic and aqueous) for the presence of phytochemicals and, their effect on 2,2-Diphenyl-1-picryl-hydrazyl radical (DPPH) was used to determine their free radical scavenging activity. Broth microdilution method was applied to detect antibacterial activity and determine minimal inhibitory concentration (MIC) of aqueous and organic extracts of *Ammivisnaga* (L.). The antimicrobial activity was examined against 3 reference strains namely: *Staphylococcus aureus* (ATCC 25923), *Escherichia coli* (ATCC 25922) and *Pseudomonas aeruginosa* (ATCC 27853). Moreover, MIC against *Acinetobacter baumannii* clinical strain was included.

Results: The results showed that *Ammi visnaga* methanolic extract contains a mixture of phytochemical classes as proteins, tannins, flavonoids, glycosides and steroids and revealed that this plant has high antioxidant activity (IC₅₀=6 µg/ml). While aqueous extract exhibited antimicrobial activity against *S. aureus* (MIC= 25 mg/ml), *E. coli* (25 mg/ml), *P. aeruginosa* (25 mg/ml) and *A. baumannii* (50 mg/ml). Organic extract of *Ammi visnaga* (L.) showed stronger inhibition of bacterial growth, where MIC values for *S. aureus*, *E. coli*, *P. aeruginosa* and *A. baumannii* were 0.35, 2.78, 5.56 and 5.56 mg/ml, respectively.

Conclusions: The results of the present study indicated that the *Ammivisnaga* (L.), especially organic extract, exhibited strong antibacterial activity against Gram-positive and Gram-negative bacterial isolates and has high antioxidant activity and therefore it can provide natural source of antibacterial drugs and

antioxidants and can be useful in preventing various diseases including cancer.