

# Investigation and Characterization of Alkaloidic Compounds from *Apium graveolens* and Estimation of their Antibacterial Activity

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## ABSTRACT

*Apium graveolens* is regarded as a traditional food plant that is found around the world and has good therapeutic efficacy against a variety of ailments. Three alkaloidic compounds were isolated and separated. And characterized by using gas chromatography-mass spectroscopy analysis. Also, the mixture of their active chemical compounds was tested qualitatively using the Dragendroff reagent. Various concentrations represented by 0, 25, 35, 50, and 65 mg/ml were prepared from the alkaloidic mixture. They recorded different inhibition diameter values equal to 3, 13, 21, 23, and 25 mm against the growth of *Staphylococcus* bacteria. At the same concentrations, however, the inhibition values against *Bacillus subtilis* bacteria were 11, 21, 23, 25, and 27 mm. It was noticed that the five alkaloidic compounds mixture was more effective against *Bacillus subtilis* than *Staphylococcus aureus* bacteria. The active alkaloidic can, therefore, be applied as a powerful natural treatment for a variety of illnesses brought on by these harmful bacteria.

**Keywords:** Active alkaloids, *Apium graveolens*, *Bacillus subtilis*, Synergistic interaction.

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## 1. INTRODUCTION

Their clinical and biochemical capacity to treat a wide range of infections and inflammations makes the health and biochemical significance of many traditional and medicinal plants evident. *Apium graveolens* is a traditional, healthy, and medicinal plant spreading in different areas in the world, and it belongs to Apiaceae family. It was carried out in ancient times as a natural therapy for diverse diseases infecting the various organs in the human being body [1], [2]. Chemically, pre-studies proved the presence of multi-active chemical compounds such as phenolics, tannins, alkaloids, terpenes, flavonoids, glycosides, essential oils, xanthenes, and coumarins in the different parts of the celery plant, especially seeds, leaves, and flowers. Additionally, these potent chemical metabolites were successfully used to counteract the biological activity of several harmful microorganisms, including fungus, bacteria, and parasites. The active chemical compounds isolated from the stem of celery were used for treatment of rheumatism, urinary treats inflammation, gout, and arthritis [3], [4]. Metabolic extract to *Apium graveolens* seeds has diverse, effective chemicals represented by steroids, alkaloids, glycosides, and flavonoids [5]. Other studies ensured the existence of phenolics, sesquiterpenes, furocoumarins, and essential oils, and these chemical metabolites were carried out against various diseases and infections [6]. Previous research has indicated the presence of antimicrobial efficacy, anti-parasitic, gastroprotective, neuroprotective, cardioprotective, hypolipidemic, antioxidant, anti-inflammatory, and anti-infertility [7], [8]. Plant alkaloids are active chemical metabolites that are anabolized biochemically via two various pathways represented by amino acids and amines in the presence of required enzymes in all steps of biosynthesis of these chemical compounds [9], [10]. The current investigation aimed on the identification, characterization, and evaluation of the celery plant's alkaloids' antibacterial activity.



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