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Antioxidant, Antibacterial and Anti-Inflammatory Activities of *Arisarum vulgare* Extracts on Wistar Rats Asthma Model

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SUMMARY. ***Arisarum vulgare,*** **an alkaloid plant from the Araceae family native to the Mediterranean region, is used in traditional medicine for various ailments. This study aimed to evaluate the biological activities, particularly anti-inflammatory, antioxidant, and antimicrobial properties, of ethanolic, methanolic, and aqueous extracts of this plant. Anti-inflammatory activity was assessed *in vivo* using an experimental asthma model with 33 rats divided into 6 groups, including controls and groups treated with plant extracts or prednisolone. Inflammatory parameters, oxidative stress, and antioxidant enzyme activities were measured. Antioxidant activities were explored using DPPH, FRAP, and β-carotene bleaching methods. Results showed a significant reduction in inflammatory cells, especially eosinophils, in both blood and bronchoalveolar lavage fluid of rats treated with plant extracts. Oxidative stress decreased, with lower MDA levels and enhanced antioxidant enzyme activities. The LCMS-MS analysis of the ethanolic extract revealed a diverse chemical composition dominated by phenolic acids and flavonoids. Fumaric acid was the most abundant compound (37.24%), followed by vanillic acid (24.69%) and 4-hydroxybenzoic acid (13.52%). Flavonoids such as kaempferol, luteolin, and myricetin were present in smaller quantities. The ethanolic extract demonstrated superior biochemical composition and antioxidant activity compared to the aqueous extract, with total phenol values of 74±5.11 mg GAE/mL versus 46 ± 0.66 mg GAE/mL, and DPPH IC_{50} values of 0.331 mg VS 2.095 mg, respectively. Antimicrobial activity was observed only for ethanolic and methanolic extracts, with varying efficacy against tested strains. The Ethanolic extract showed inhibition zones against *Escherichia coli* (12.33 ± 4.61 mm), *Serratia sp.* (14.33 ± 3.21 mm), *Candida albicans* (13.66±1.52 mm), and *Fusarium roseum* (10 ± 1.732 mm). The Methanolic extract was effective against *Klebsiella pneumoniae* (10.66 ± 4.04 mm), *Staphylococcus aureus* (11.66 ± 0.57 mm), and *Candida albicans* (12.33 ± 1.52 mm). *Arisarum vulgare* shows promising therapeutic potential against various inflammatory, oxidative, and microbial diseases.**

RESUMEN. *Arisarum vulgare*, una planta alcaloide de la familia Araceae nativa de la región mediterránea, se utiliza en la medicina tradicional para diversas dolencias. Este estudio tuvo como objetivo evaluar las actividades biológicas, en particular las propiedades antiinflamatorias, antioxidantes y antimicrobianas, de los extractos etanólicos, metanólicos y acuosos de esta planta. La actividad antiinflamatoria se evaluó in vivo utilizando un modelo experimental de asma con 33 ratas divididas en 6 grupos, incluidos controles y grupos tratados con extractos de plantas o prednisolona. Se midieron los parámetros inflamatorios, el estrés oxidativo y las actividades de las enzimas antioxidantes. Las actividades antioxidantes se exploraron utilizando métodos de blanqueo con DPPH, FRAP y β-caroteno. Los resultados mostraron una reducción significativa de las células inflamatorias, especialmente los eosinófilos, tanto en la sangre como en el líquido de lavado broncoalveolar de las ratas tratadas con extractos de plantas. El estrés oxidativo disminuyó, con niveles más bajos de MDA y actividades enzimáticas antioxidantes mejoradas. El análisis LCMS-MS del extracto etanólico reveló una composición química diversa dominada por ácidos fenólicos y flavonoides. El ácido fumárico fue el compuesto más abundante (37,24%), seguido del ácido vainílico (24,69%) y el ácido 4-hidroxibenzoico (13,52%). Los flavonoides como el kaempferol, la luteolina y la miricetina estaban presentes en cantidades

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E.coli, K. pneumoniae, Serratia sp., and Gram positive bacteria like *S. aureus* and against pathogenic yeast and mold like *C. albicans* and *Fusarium roseum* and it will be interesting to extend the study to other biological activities and to determine the bioactive molecules by a sophisticate methods such as HPLC and molecular Docking.

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