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## **Free radical scavenging, antimicrobial and immunomodulatory activities of Orthosiphon stamineus.**

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#### **Abstract**

Orthosiphon stamineus is considered an important traditional folk medicine. In this study ethanol and aqueous extracts of *O. stamineus* were evaluated in vitro for their antioxidant, antimicrobial as well as for their immunomodulatory properties on human peripheral blood mononuclear cells (PBMCs). The DPPH radical scavenging method was used for the determination of antioxidant activity, while the antibacterial efficacy was investigated by both disc diffusion method and Minimum Inhibitory Concentration (MIC) against four bacterial strains (Gram-positive and Gram-negative). Furthermore, the immunomodulatory potential of the extracts was investigated through the MTT assay. Aqueous extract of *O. stamineus* exhibited significant free radical scavenging activity with  $IC_{50}$  50 9.6  $\mu$ g/mL, whereas the  $IC_{50}$  for the ethanol extract was 21.4  $\mu$ g/mL. The best antimicrobial activity was shown by the aqueous extract of *O. stamineus* against *Staphylococcus aureus*, with inhibition zone of 10.5 mm and MIC value 1.56 mg/mL. Moreover, the results observed from the MTT assay showed that both plant extracts stimulated the PBMCs proliferation in vitro in a concentration-dependent manner, but the aqueous extract has remarkable activity against PBMCs. These findings indicate that *O. stamineus* showed high antioxidant activity and may be considered as an immunomodulatory agent.

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