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In Vitro Antimycoplasmal Activity of Peganum harmala on Mycoplasma hominis Tunisian Strains

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Abstract : Background and aim: Mycoplasma hominis is an opportunistic pathogen that can cause various gynecological infections such cervicitis, infertility, and, less frequently, extra-genital infections. Previous studies on the antimicrobial susceptibility of Mycoplasma hominis Tunisian strains have highlighted a significant resistance, even multi-resistance, to the most used antibiotic in the therapy of consequential infections. To address this concern, the present study aimed for the alternative of phytotherapy. Peganum harmala seed extract was tested as an antibacterial agent against multidrug-resistant M.hominis clinical strains. Material and Methods: Peganum harmala plant was collected from Ain Sebaa, Tabarka, North West region of Tunisia in April 2018, air-dried, grounded and extracted by different solvents.The crude methanolic extract was further partitioned with n-HEX, DCM, EtOAC and n-BuOl. Antibacterial activity was evaluated against M. hominis ATCC 23114 and 20 M. hominis clinical strains.The antimycoplasmal activity was tested by the microdilution method, and MIC values were determined. Phytochemical analysis and hemolytic activity on human erythrocytes were also performed. The active fraction was then subjected to purification, and the chemical identification of the active compound was investigated. Results: Among the tested fractions, the n-BuOH extract was the most active fraction since it exhibited an inhibitory effect against M. hominis ATCC 23114 and 80% of the tested clinical strains with MIC between 125 and 1000 µg/ml. The phytochemical analysis of the n-BuOH revealed its metabolic abundance in polyphenols, flavonoids and condensed tannin with levels of 257.37 mg AGE/g, 172.27 mg EC/g and 58.27 mg EC/g, respectively. In addition, P. harmala n-BuOH extract exhibited potent bactericidal activity against all M. hominis isolates with CMB values ranging between 125 and 4000 µg/ml. Further, the active fraction exhibited weak cytotoxicity effect at active concentrations when tested on human erythrocytes. The active compound was identified by gas chromatography–mass spectrometry as an indole alkaloid harmaline. Conclusion: In summary, Peganum harmala extract demonstrated an interesting anti-mycoplasmal activity against M. hominis Tunisian strains. Therefore, it could be considered as a potential candidate for the treatment of consequential infections. However, further studies are necessary to evaluate its mechanism of action in mycoplasmas.

Keywords : mycoplasma hominis, peganum harmala, antibioresistance, phytotherapy, phytochemical analysis
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