Antioxidant and Antimicrobial Efficacies of Withania Coagulans Seed Extract against Pathogenic Bacteria and Fungi

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Abstract

The present study was conducted to evaluate the nutritional profile, phytochemical screening, antimicrobial and antioxidant activities of aqueous and acetonic extract of Withania coagulans by standard chemical analysis methods. Proximate analysis revealed that aqueous extract of W.coagulans is a rich source of soluble solids (16.1 ± 1.5%), fiber (15.5 ± 0.1%), pH (11.5 ± 0.19%), ash (11.2 ± 0.2%), sugar (9.7 ± 0.1%) and ascorbic acid (9.7 ± 0.1 mg/100ml). Phytochemicals detected were flavonoids, glycosides, carbohydrate & sugar, phenolic compounds, proteins & amino acids, tannins, gum and mucilage while phytosterols were absent. The antifungal and antibacterial activities of these extracts were determined against ten bacterial (Escherichia coli, Bacilluscereus, Staphylococcus aureus, Clostridium, Escherichia coli (Human), Bacillus subtilius, xanthomonas, Salmonella typhi, Salmonella heidelberg and Klebsiella pneumonia) and five fungal strains (Aspergillus niger, Entomola, Aspergillus flavus, Alternaria alternata and Penicillusium) using the agar well diffusion method. The acetonic extract of W. coagulans indicated highest antibacterial activity (12mm) against clostridium and Salmonella heidelberg and lowest action (5mm) against E. coli (Human.). Highest antifungal activity (10mm) was recorded against Alternaria alternata and PenicillusiumwhileAspergillus nigershowedlowest zone of inhibition (6mm). Streptomycin was used as a control. The antioxidant activity was assessed by 1, 1-diphenyl-2-picryl hydrazyl (DPPH) free radical scavenging method using the ascorbic acid as standard. The acetonic extract of W.coagulans exhibited highest scavenging activity (72%) at concentration of 30mg/ml, with an IC₅₀ value (18µg/ml) as compared to control (4µg/ml). The presence of bioactive compounds, nutrients and biochemical screening indicated that the seeds of W. coagulans can serve as a potential and possible nutraceutical source for the treatment various pathologies.

Keywords: Withania coagulans, Phytochemicals, Antimicrobial, Antioxidant potential.