

Abstract

Investigation of antibacterial activity and synergistic antibacterial potential of sericin protein extracts [†]

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Abstract: Many antibacterial agents have been continuously used by various industries in order to extend the shelf life by controlling spoilage bacteria and reducing the risk from pathogenic bacteria. However, there is a concern for safety and various health-related issues. Sericin in silk cocoon is considered as a waste product in the silk industry, and usually thrown away. Sericin is known to possess a number of important biochemical properties. Considering this, in the present study, sericin protein was extracted from the silk cocoon by degumming process and its antibacterial activity was investigated against a number of foodborne pathogenic bacteria by the standard procedures. Its synergistic antibacterial activity was also investigated using both sericin protein and the standard antibiotics such as ampicillin, azithromycin, cephalexin, erythromycin, gentamycin, kanamycin and streptomycin. The results showed that sericin extract displayed a prominent antibacterial effect against all the tested foodborne pathogenic bacteria with the diameter of inhibition zones ranged from 9.44±0.04 to 12.09±0.58 and the results are comparable with the standard antibiotics. The sericin extract at 500µg/disc displayed highest inhibition zones against both the tested *Escherichia coli* (12.09±0.58 mm) and the *Listeria monocytogenes* (11.51±0.35 mm). Further, the sericin along with the standard antibiotics at (25µg+5µg)/disc respectively displayed significant antibacterial potential against all the tested foodborne pathogenic bacteria with the highest inhibition zone against the *Salmonella Typhimurium* (26.59±0.74 mm). The minimum inhibitory concentration and minimum bactericidal concentration values of the sericin extract ranged from 0.0625 – 1.0 mg/mL. This data suggested that the sericin extract has a promising antibacterial potential, which can be utilized in the various industries as an effective antibacterial agent.

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