



rethink food resources, losses, and waste 2024

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From Food Wastes to Innovative Crayfish Chitosan Bioactive Membranes to Fight Common Infections

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Abstract

Bacterial and fungal vaginal infections pose significant health risks, necessitating effective and practical treatment strategies. Traditional antimicrobial treatments include pills, lotions, gels, and capsules. Recently, vaginal films have gained popularity due to their softness, flexibility, and ability to dissolve in vaginal fluid. These films are composed of plasticizers, antimicrobials, and polymers (Machado et al., 2013). A vaginal film based on the derivative of crayfish chitin (chitosan) was created to offer sustainable treatment. Chitosan, a renewable and biodegradable biopolymer, presents exceptional chemical, physical, and biological properties. It is non-toxic, exhibits antibacterial activity, has mucoadhesive properties, and tends to gel upon dissolution, making it an ideal material for antimicrobial film production. The extraction procedure for chitin and its conversion to chitosan was established. The biomaterial was then characterized using FTIR, DSC, XRD, and DLS techniques. Subsequently, a bioactive membrane aimed at protecting against vaginal infections was developed. The interactions between the film and a simulated vaginal fluid were thoroughly examined, focusing on pathogenic microbes such as *Escherichia coli*, *Candida albicans*, MSSA, and MRSA. This study demonstrated as a proof-of-concept, the potential of chitosan-based films derived from crayfish shells for the prevention and treatment of vaginal infections (Zhao et al., 2018).

Keywords: crayfish, chitosan, biological properties, membranes, vaginal infections

References

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