COVALENT ELECTROSPRAYED NANOPARTICLES BASED ON PROTEASE TREATED ARABINOXYLANS

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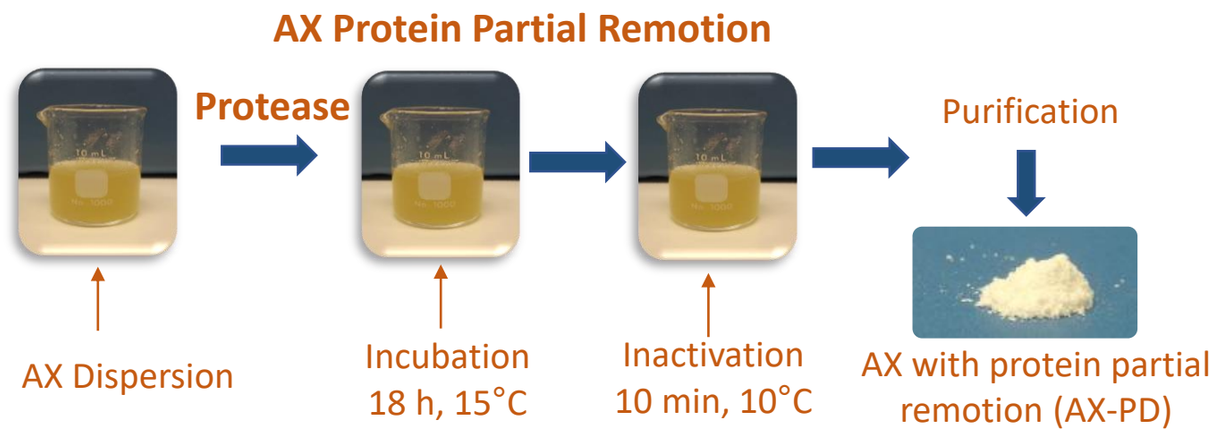
INTRODUCTION

Arabinoxylans (AX) are polysaccharides constituted by a linear chain of β-(1→4) xylose units and α- L-arabinose substitutions, which can be esterified to ferulic acid (FA). A small amount of protein is associated with the AX chains [1]. AX have the ability to form covalent gels via FA oxidative coupling [2]. AX gels are resistant to pH and temperature changes but fermented by colonic microbiota, being therefore attractive as controlled release systems for therapeutic agents directed to the colon [3]. The AX capability to form covalently cross-linked nanoparticles was recently reported [4]; however, that investigation did not consider the effect of protein content in this polysaccharide property.

AIM: Evaluate the effect of AX protein partial remotion on the polysaccharide potential to form covalent electrosprayed nanoparticles.

METHODS



RESULTS

Table 1. % Protein of AX and AX-PD

Sample	% Protein
AX	16.4
AX-PD	10.8

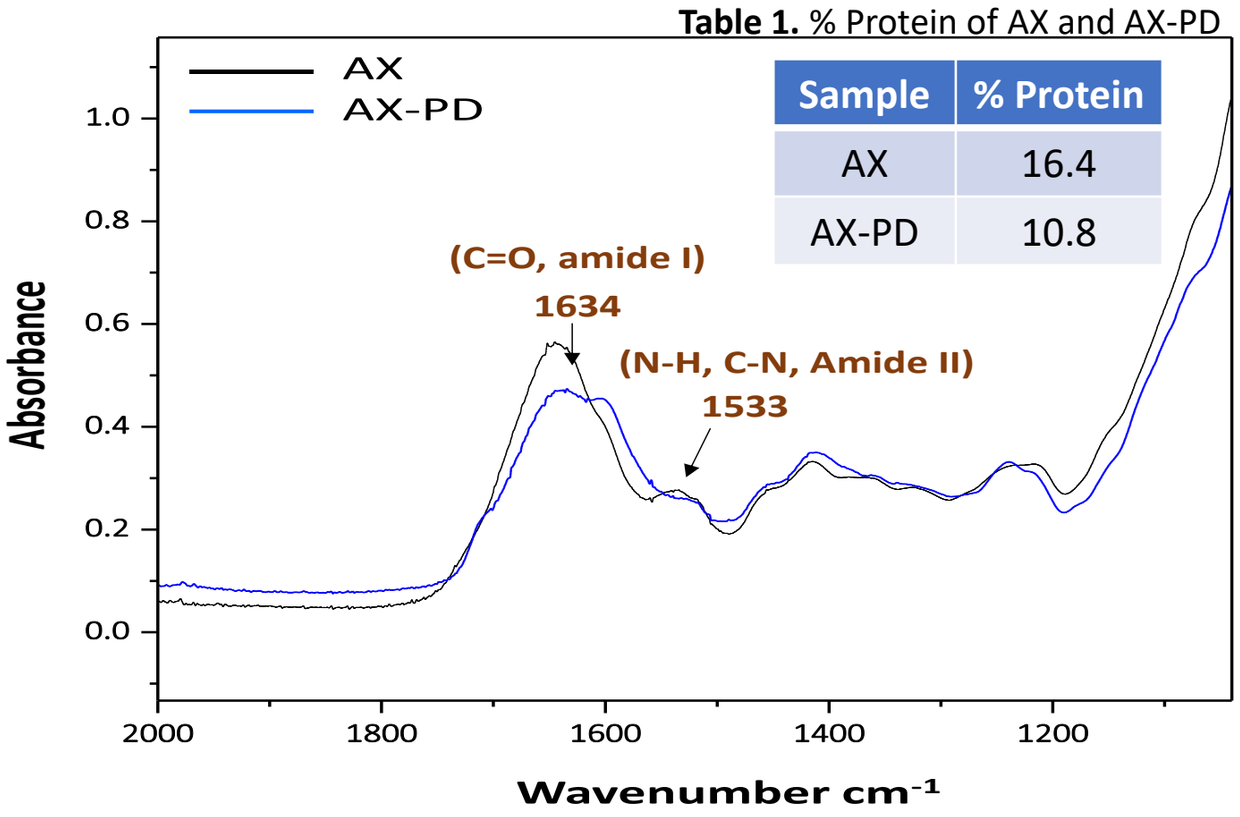


Figure 1. FTIR spectrum of AX and AX-PD.

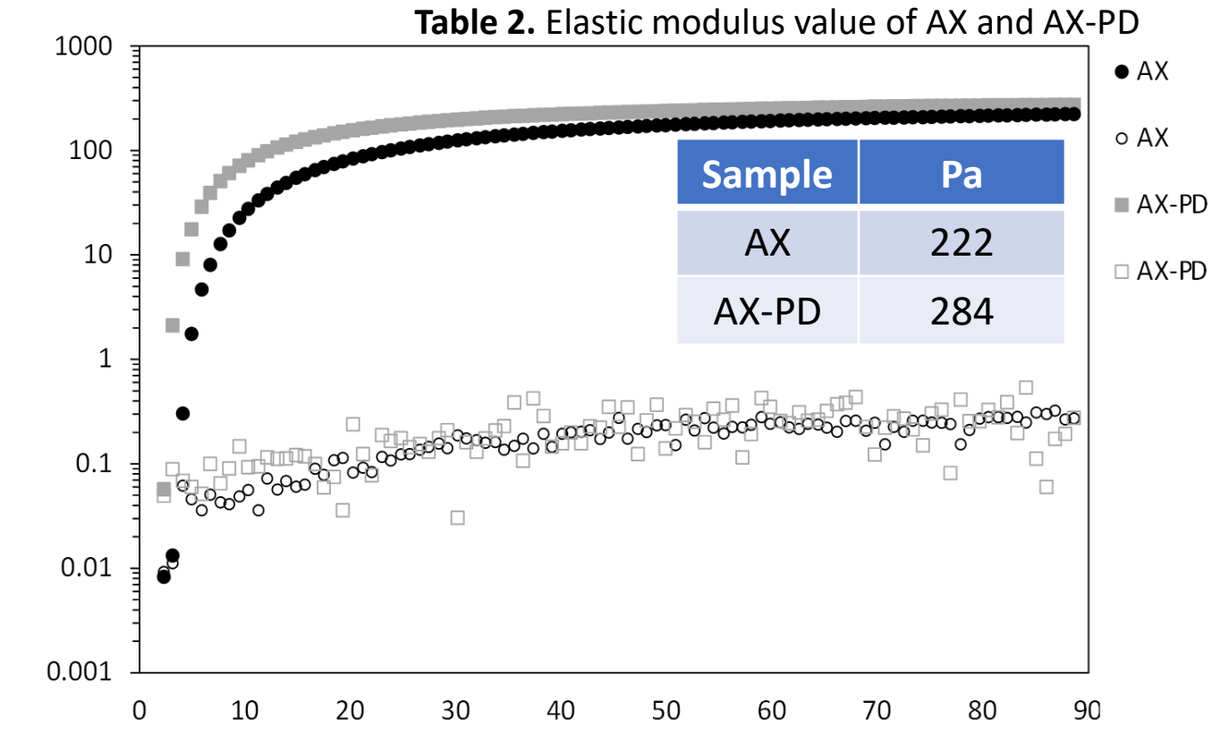


Table 2. Elastic modulus value of AX and AX-PD

Sample	Pa
AX	222
AX-PD	284

Figure 2. Rheological kinetics of 1% (w/v) dispersion of AX and AX-PD during gelation by laccase at 0.25 Hz and 5% strain.

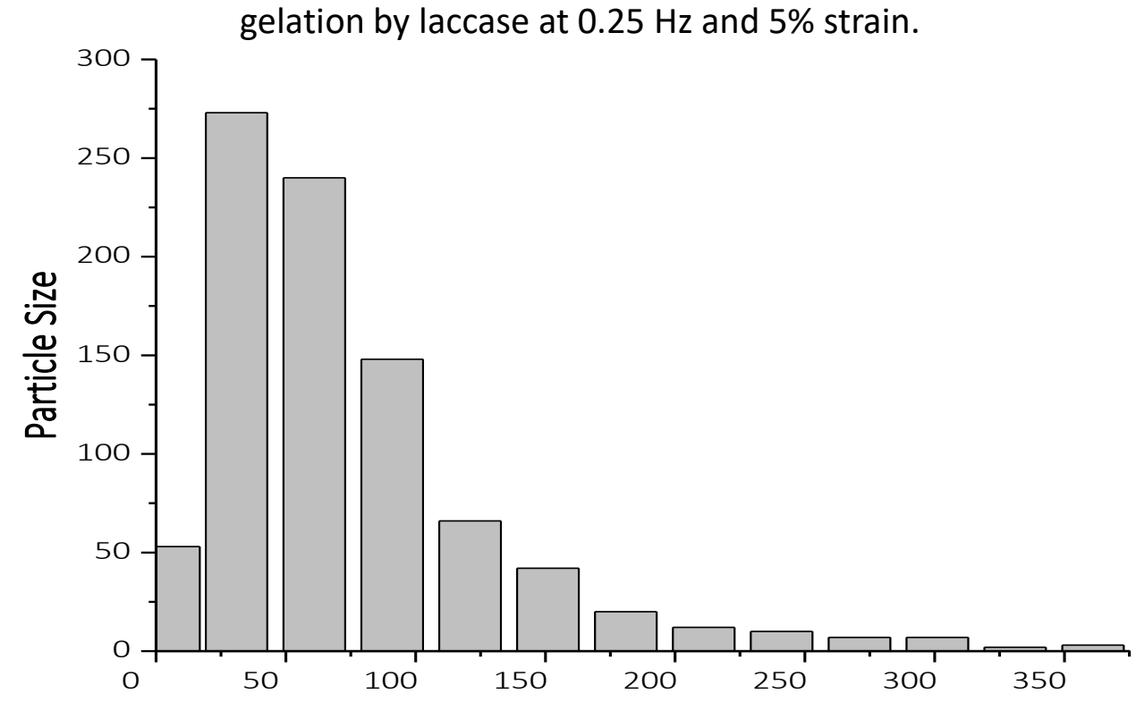


Figure 3. Particle Size of AX nanoparticles

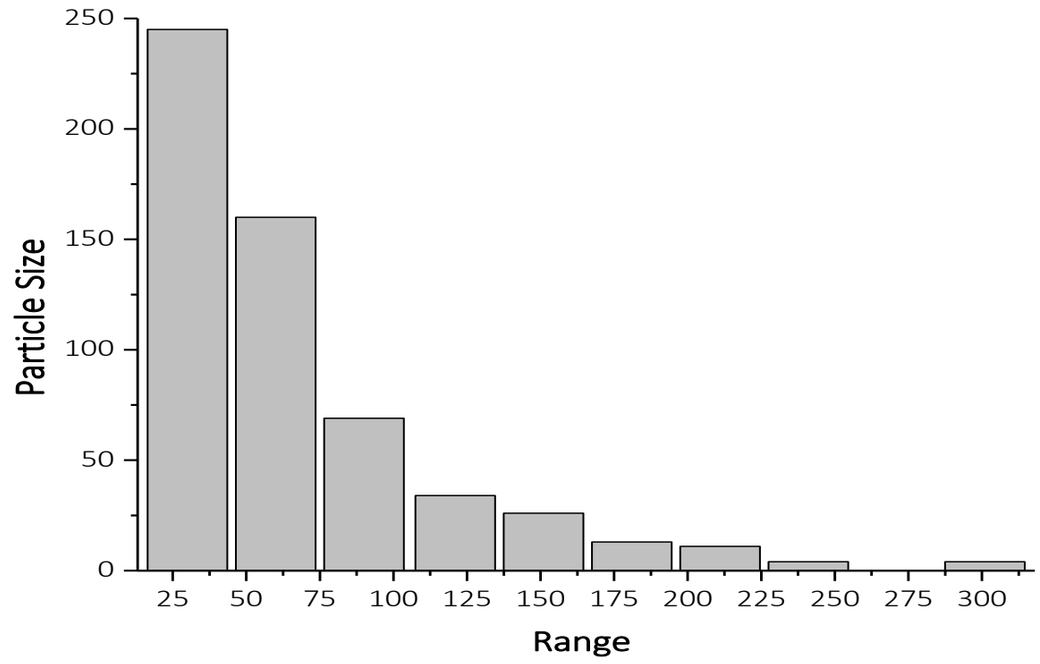


Figure 4. Particle Size of AX-PD nanoparticles

CONCLUSION

The AX protease treatment improves the polysaccharide capability to form covalent electrosprayed nanoparticles. This strategy may represent an opportunity for pharmaceutical and biomedical applications.

ACKNOWLEDGEMENTS

The authors are pleased to acknowledge Alma C. Campa and Karla G. Martinez for technical support in Biopolymers laboratory; to J. Alfonso Sánchez Villegas for technical assistance in the electrospray system and to Eduardo A. Larios for transmission electron microscopy analysis. The TEM experiments were performed at the TEM Laboratory of the University of Sonora.

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