



TENSILE EVALUATION OF BIODEGRADABLE STARCH FILMS FOR USE AS DRESSINGS

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Abstract – Among the various renewable and cost-effective resources, starch is recognized as a highly suitable raw material for the production of biopolymers [1]. This study is focused on the development of films comprised of starch, glycerol, and a natural resin extract (NRE) derived from *Dracaena* species, which possesses components known for their healing properties [2]. Polymeric films (PF) were produced using Corn Starch (CS) and Potato Starch (PS). The composite films were obtained by mixing the starch, glycerol, NRE and deionized water (Table 1). The mixture was heated in a microwave oven at a 300W power for approximately 5 minutes and molded by tape casting, and dried in an oven at 30°C. Tensile tests were performed on a mechanical testing machine, using a 20 kgf load cell, a speed of 5 mm/min with films of dimensions: 100 mm of length, 10 mm of width, and thickness of 0.2 mm. Film 3-CS exhibited the highest tensile strength, with an elongation of approximately 38%. When compared to the control sample (Film 1-CS), the maximum tensile strength increased by nearly four times, while the elongation doubled (Table 1). This indicates that the use of NRE positively influences the tensile properties of the material. The values were also higher than the film 5 (5% of starch). It can be concluded that Film 3-CS offers promising potential as a healing and resistant dressing. This study is in progress; assessments of the biodegradability and antiviral properties of the films will be conducted to evaluate the influence of NRE's presence on these characteristics.

Table 1 – Composition of PF and tensile properties

Sample	Content (wt%)				Maximum tensile strength (MPa)	Elongation at break (%)
	Starch	Glycerol	NRE	Water		
1-CS	10.0	5.0	0.0	85.0	0.79±0.25	15.88±6.0
2-PS	10.0	5.0	0.0	85.0	1.52±0.07	44.55±7.7
3-CS	10.0	5.0	0.5	84.5	2.92±0.16	37.78±6.0
4-PS	10.0	5.0	0.5	84.5	0.93±0.19	26.44±7.8
5-CS	5.0	5.0	0.5	84.5	0.56±0.08	17.71±4.1

References

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