foods

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Supplementary Materials

Biofilm formation reduction by eugenol and thymol on biodegradable food packaging material

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In this Supplementary Materials, the following tables and figure are presented:

Table S1. Comparison of methods for evaluating the biofilm formation.

Figure S1. The FTIR spectra of pure and modified polymers in the range 4000 to 3000 cm^{-1}; PLA: poly(lactic) acid, PBAT: poly(butylene adipate-co-terephthalate), PBS: poly(butylene succinate), E: 3% w/v eugenol, T: 3% w/v thymol.

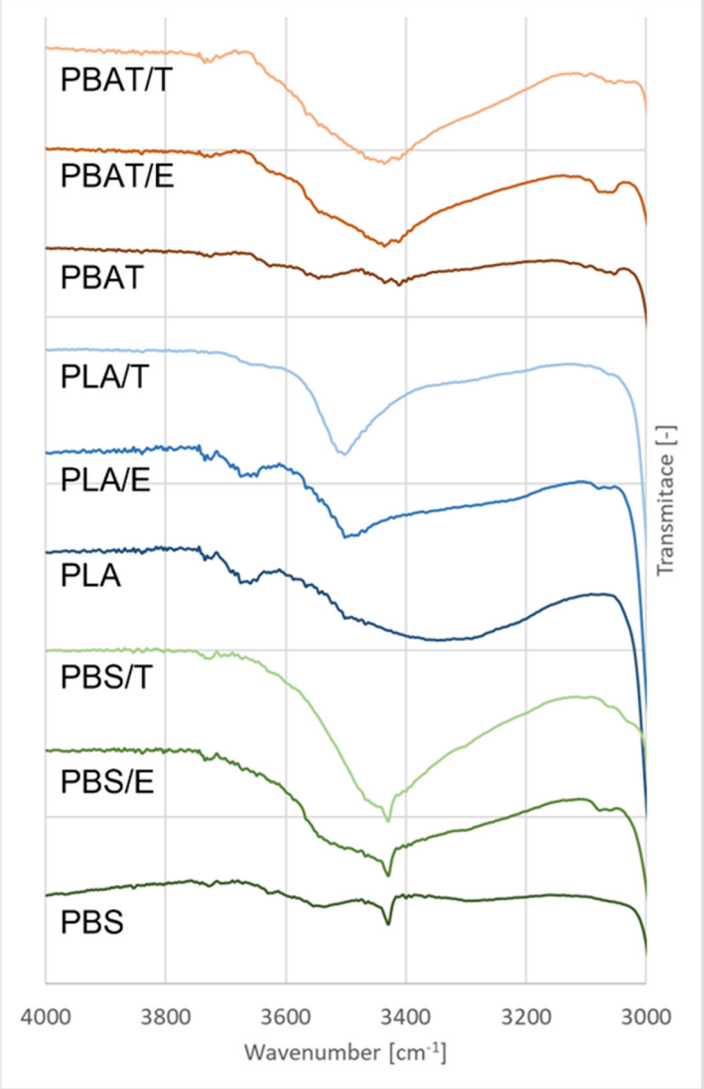
Table S1. Comparison of methods for evaluating the biofilm formation.

Material	Method	*B. tequilensis* R23	*B. subtilis* R25	*B. pumilus* R34	*S. maltophilia* GK CIP 1/1	*E. coli* ATCC 25922	*S. aureus* ATCC 25923
PLA	MTT assay	-	-	-	-	-	-
	Christensen method	-	-	-	-	-	-
	Fluorescence microscopy (LIVE)	+++	+++	+++	+	+++	+++
	Fluorescence microscopy (DEAD)	+	-	-	+	++	++
PLA/T	MTT assay	-	-	-	-	-	-
	Christensen method	-	-	-	-	-	-
	Fluorescence microscopy (LIVE)	-	-	-	-	-	-
	Fluorescence microscopy (DEAD)	-	-	-	-	-	-
PLA/E	MTT assay	-	-	-	-	-	-
	Christensen method	-	-	-	-	-	-
	Fluorescence microscopy (LIVE)	-	-	-	-	-	-
	Fluorescence microscopy (DEAD)	-	-	-	-	-	-
PBS	MTT assay	+	+	+	+	+	+
	Christensen method	-	-	+	+	-	-
	Fluorescence microscopy (LIVE)	-	++	-	++	-	+
	Fluorescence microscopy (DEAD)	++	+	++	+	+++	+
PBS/T	MTT assay	-	-	-	-	-	-
	Christensen method	-	-	-	-	-	-
	Fluorescence microscopy (LIVE)	-	-	-	-	-	-
	Fluorescence microscopy (DEAD)	-	-	-	-	-	-
PBS/E	MTT assay	-	-	-	-	-	-
	Christensen method	-	-	-	-	-	-
	Fluorescence microscopy (LIVE)	-	-	-	-	-	-
	Fluorescence microscopy (DEAD)	-	-	-	-	-	-
PBAT	MTT assay	-	-	-	-	-	-
	Christensen method	+	+	+	+	+	+
	Fluorescence microscopy (LIVE)	-	-	-	+	+++	-
	Fluorescence microscopy (DEAD)	-	-	-	-	+++	-
PBAT/T	MTT assay	-	-	-	-	-	-
	Christensen method	-	-	-	-	-	-
	Fluorescence microscopy (LIVE)	-	-	-	-	-	-
	Fluorescence microscopy (DEAD)	-	-	-	-	-	-
PBAT/E	MTT assay	-	-	-	-	-	-
	Christensen method	-	-	-	-	-	-
	Fluorescence microscopy (LIVE)	-	-	-	-	-	-
	Fluorescence microscopy (DEAD)	-	-	-	-	-	-

PLA: poly(lactic) acid, PBAT: poly(butylene adipate-co-terephthalate), PBS: poly(butylene succinate), T: 3% w/v thymol, E: 3% w/v eugenol.

MTT assay and Christensen method: -: non-biofilm formation, +: with weak biofilm formation, ++: with strong biofilm formation ($p < 0.003$).

Fluorescence microscopy: -: without microorganisms, +: 1–10 microorganisms, ++: 10–50 microorganisms, +++: > 50 microorganisms.



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