

Supplementary figures:

Figure S1. Physical appearance of films (A-R). Films were observed to be transparent and white in appearance.

Figure S2. Standard curve of gallic acid

Figure S3. A: SEM showing the smooth and uniform surface of the films, B: SEM showing the layered cross-section of the films

Figure S4. Change in film color with increased OPE concentration (A) Film G (B) Film O

Figure S5. Change in (A) moisture content and (B) Solubility of films with varying OPE concentration

Figure S6. Change in tensile properties of films (A) G, and (B) O, with increase in OPE concentration

Figure S7. Fig S7: antimicrobial activity of OPE as compared to sodium benzoate on (A) *B. megatrium*, (B) *S. aureus*, (C) *E. coli* and (D) *C. albicans* (E) antimicrobial effect of films (G, I, K, M, O, and Q) with different concentrations of OPE on different microbes. G- Film G without any OPE, G1- Film G with 1% OPE, G5-Film G with 5% OPE, G10-Film G with 10% OPE, G15-Film G with 15% OPE, G20- Film G with 20% OPE. Similar concentrations have been used and marked for other films.

Figure S8. Packaging of blueberries in OPE incorporated films (A-B), Physical appearance of blueberries are 15 days of incubation (C-D)

Table S1. Composition of different films (A-R)

Table S2. Change in the thickness of films (G and O) with increasing OPE concentration

Table S3. TPC of OPE and OPE-blended films.