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<AT>Synthesis and characterization of polyvinyl alcohol- carboxymethyl tamarind gum based composite films

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<ABS-HEAD>Highlights ► Novel composite films of polyvinyl alcohol and carboxymethyl tamarind gum were prepared. ► Hydrogen bonding within the films was composition-dependent. ► Composition-dependent viscoelastic nature and the thermal properties of the films was observed. ► Composite films promoted the cell proliferation of the human keratinocytes.

<ABS-HEAD>Abstract

<ABS-P>The present study delineates the synthesis of novel composite films using polyvinyl alcohol and carboxymethyl tamarind gum. The microscopic study results confirmed the formation of composite matrices. FTIR spectroscopy suggested the occurrence of hydrogen-bonding amongst the components of the films. The extent of hydrogen bonding was composition-dependent which reached a critical higher limit at a particular composition. At the critical composition, the instantaneous and the intermediate polymer relaxation time was longer. All the films were found to be viscoelastic in nature. The melting endotherm was also highest for the composition described above. Ciprofloxacin loaded films showed excellent antimicrobial property against *E. coli*, suggesting that the drug was released in its active form. Cell proliferation study using human keratinocytes suggested better cell proliferation in the CMT containing films as compared to the control (PVA only) film. In gist, the developed films can be explored for skin tissue engineering and drug delivery applications.

<KWD>Keywords: **Polyvinyl alcohol; Carboxymethyl tamarind gum; Composite films; Skin tissue engineering; Drug delivery.**

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