

## Controlled Dual Release Study of Curcumin and a 4-Aminoquinoline Analog from Gum Acacia Containing Hydrogels

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### Abstract

The potential of gum acacia containing hydrogels as controlled dual-drug delivery systems for antiprotozoal agents was investigated. 4-Aminoquinoline analog and curcumin were selected as model drugs because they exhibit antiprotozoal activity. The maximum release time was greater for curcumin than for the 4-aminoquinoline analog at 37°C, thereby enabling the active ingredients to work over different periods of time. 4-Aminoquinoline analog exhibited a short term release profile while curcumin exhibited a sustained and long term release profile. The release profiles of the drugs were found to be influenced by the degree of crosslinking of the hydrogel network with gum acacia. The release profiles were analyzed using a power law equation proposed by Peppas. The release mechanism of the 4-aminoquinoline was found to be anomalous transport while that of curcumin was quasi-Fickian diffusion mechanism in all the hydrogel networks according to the release exponent. The preliminary results suggest that these systems are potential dual-drug delivery system for antiprotozoal agents with different pharmacokinetics.