ABSTRACT

CHARACTERIZATION AND IN VITRO RELEASE OF ANDROGRAPHOLIDE – CARBOXIMETHYL CHITOSAN NANOPARTICLE USING CROSS-LINKER (Prepared by Ionic Gelation - Spray Drying)

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Andrographolide is an major component of herb sambiloto (Andrographis paniculata) which have activity like hepatoprotector, anticancer, antidiabetic, and anti-malarial that belonged to Biopharmaceutics Classification System (BCS) class IV which has low solubility and low permeability so andrographolide has low bioavaibility. Particulate system technology such as nanoparticle can be used to improve drug bioavaibility because the modification of physicochemical and biopharmaceutical. In this study nanoparticle was made by ionic gelation-spray drying method using cross-linker. Characterization of the nanoparticle was done using SEM, DTA, FTIR, X-Ray Diffraction, drug recovery, and in vitro release. The result shows that particulate system has a rough surface and not spherical shape. Based on the result of FTIR, nanoparticle system shows sharper peaks of –OH/-NH at wavenumber 3435-3400 cm^{-1} compared wiht peaks of carboxymethyl chitosan. The result of DTA, crosslinked and non-crosslinked particulate system shows sharp and different endothermic peak compared with endothermic peak of andrographolide. X-Ray diffractogram of particulate system shows crystalline peak of andrographolide disappear.The release rate of nanoparticle system higher and significantly difference statisticallythan andrographolide.

Keywords: andrographolide, carboxymethyl chitosan, $CaCl_2$, crosslinking, ionic gelation, spray drying