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Simultaneous Determination of Gatifloxacin and Levofloxacin in Todd-Hewitt Broth Employing an *In Vitro* Pharmacokinetic-Pharmacodynamic Model

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***SUMMARY*. An isocratic, accurate, simple and precise high performance liquid chromatographic method was validated for the determination of gatifloxacin and levofloxacin in Todd-Hewitt broth. A simple one step protein precipitation extraction with acetonitrile was employed. Separation using a C_{18} column and a flow rate of 1.0 mL/min was performed. The mobile phase consisted of 2.0 mM phosphoric acid:acetonitrile:methanol:triethylamine (64.7:22:13:0.3, v/v/v/v). The fluorescence detector was set at excitation and emission wavelengths of 295 nm and 480 nm, respectively. The calibration curves were linear (r ≥ 0.9984, gatifloxacin; r ≥ 0.9992, levofloxacin) over a concentration range of 0.15-3.0 μg/mL. The intra- and inter-day precision were less than 15 % for all concentrations investigated and quality control samples. The recovery values were up to 97.20 % and 96.19 % to gatifloxacin and levofloxacin, respectively. The fluoroquinolones were stable in Todd-Hewitt broth for 24 h. The proposed method was demonstrated to be useful for pharmacokinetic-pharmacodynamic studies of gatifloxacin and levofloxacin in an *in vitro* model.**

KEY WORDS: Gatifloxacin, *In vitro* model, Levofloxacin, Liquid chromatography, Todd-Hewitt broth.

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