

*Research Paper :*

## Method development and validation for the simultaneous estimation of aceclofenac, paracetamol and chlorzoxazone in pharmaceutical dosage forms by high performance thin layer chromatography

T. VENKATESH KARTHIKEYAN, V. VAITHYALINGAM, G. YUVARAJ, A. RAVI KUMAR AND R.K. NEMA

Accepted : February, 2009

### ABSTRACT

A simple, rapid, sensitive and highly precise High Performance Thin Layer Chromatographic Method has been developed for the estimation of Paracetamol, Aceclofenac and Chlorzoxazone in tablets. HPTLC was performed on CAMAG LINOMAT IV, TLC Scanner Version 3.20, using toluene, ethyl acetate and glacial acetic acid (17.5:10:0.5 v/v) as mobile phase. The Chromatogram was developed in CAMAG twin trough glass containing mobile phase. The TLC plates were scanned at 271 nm in shimadzu dual wavelength scanner, and  $R_f$  value of Paracetamol, Aceclofenac and Chlorzoxazone was found to be 0.12, 0.29 and 0.72, respectively. The linearity of Paracetamol, Aceclofenac and Chlorzoxazone shows a correlation coefficient of 0.9995, 0.9991, and 0.9997, respectively. The proposed method was validated by determining sensitivity, accuracy, precision and system suitability parameters.

See end of the article for authors' affiliations

Correspondence to:

**R.K.NEMA**

Rishiraj College of Pharmacy, INDORE (M.P.) INDIA

**Key words :** Paracetamol, Aceclofenac, Chlorzoxazone, Toluene, Ethyl acetate, Glacial acetic acid, HPTLC, Validation

Aceclofenac {2[(2,6-dichlorophenyl)amino]benzoic Acid carboxymethyl ester} is an analgesic and non-steroidal anti-inflammatory drug. Paracetamol (p-hydroxy acetanilide) is a compound with analgesic and antipyretic properties. It is much safer than aspirin in terms of gastric irritation, ulceration and bleeding. Chlorzoxazone (5-chloro-2(3H)-benzoxazolone) is a compound with skeletal muscle relaxant property. It is used to decrease muscle tone and tension and used to relieve spasm and pain associated with musculoskeletal disorders. Aceclofenac is official in B.P<sup>1</sup>, paracetamol in B.P and I.P<sup>2,3</sup> and chlorzoxazone in U.S.P<sup>4</sup>. B.P. suggests a potentiometric assay method for aceclofenac in bulk drugs. The I.P. and B.P. both suggest titrimetric and UV spectrophotometric assay method for paracetamol in bulk and tablet formulations. Literature survey revealed that high performance liquid chromatography spectrofluorimetric<sup>5</sup>, calorimetric<sup>6</sup>, densitometric<sup>7</sup> and (HPLC)<sup>8,9</sup> methods have been reported for the estimation of aceclofenac in pharmaceutical dosage forms. A spectrophotometric method<sup>10</sup> has been reported for the simultaneous estimation of three drugs in formulation. This prompted us to develop and validate HPTLC method for the simultaneous estimation of Paracetamol, Aceclofenac and Chlorzoxazone in tablets.

### MATERIALS AND METHODS

#### *Instruments used:*

CAMAG LINOMAT IV (Schimadzu Dual

Wavelength Scanner), Silica HPTLC Plate, CAMAG Sample Applicator, CAMAG twin trough glass chamber, Hamilton Syringe-2.5 $\mu$ l, CAMAG TLC Scanner Version 3.20.

#### *Chemicals and reagents:*

Toluene, Ethyl acetate, Glacial acetic acid (HPLC grade from E-Merck).

#### *Mobile phase:*

Mixed 35ml of Toluene with 10 ml of ethyl acetate and then 1ml of glacial acetic acid is added to get the required mobile phase.

#### *Chromatographic conditions:*

Stationary phase : silica gel G<sub>f</sub> 254  
Mobile phase : Toluene+ethyl acetate+ glacial acetic acid 17.5:10:0.5 (v/v)  
Lamp : deuterium  
Wave length : 271nm  
Migration distance : 70mm  
Bandwidth : 3mm  
Distance between : 10mm  
the tracks

Varying quantities of the stock solution was suitably diluted with methanol to obtain the concentration of 100-500  $\mu$ g/ml for Paracetamol, 100-500  $\mu$ g/ml for Chlorzoxazone and 20-100  $\mu$ g/ml for Aceclofenac. The