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Spectrophotometric estimation of rutin

M. NARAYANA REDDY, K.V.S. PRASADA RAO and D.G. SANKAR
Dept. of Pharmaceutical Sciences, Andhra University, Visakhapatnam 530 003

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A simple spectrophotometric method has been developed for the estimation of rutin from pharmaceutical dosage forms using the chromogenic agent, 3-methyl benzothiazolin-2-one hydrazone (MBTH). The coloured complex exhibits maximum absorption at 500 nm and obeys Beer's law in the concentration range of 10-50 mcg/ml of rutin.

RUTIN (5,7,3',4'-tetrahydroxy flavonol-3-rhamnoglucoside) is used in pharmaceutical formulations for its vitamin P activity. Various spectrophotometric methods have been reported[1-7] for the determination of rutin in pharmaceutical preparations. MBTH reagent was utilised for the spectrophotometric determination of some phenols using various oxidants[8,9]. It was extended to other phenolic compounds with ceric ammonium sulphate by Michael[10]. The present work was taken up to apply above mentioned reaction to the spectrophotometric determination of rutin.

3-Methyl benzothiazolin-2-one hydrazone (MBTH) 2 mg/ml solution was prepared by dissolving 200 mg of MBTH in 100 ml of distilled water.

Ceric ammonium sulphate, 10 mg/ml solution was prepared by dissolving 1 g of ceric ammonium sulphatea in 100 ml of 0.72 M sulphuric acid.

An accurately weighed portion (20 mg) of rutin was dissolved in 95% ethanol and the volume was made upto 100 ml with the same solvent so as to obtain a concentration of 200 mcg/ml. Alternatively, 20 tablets were accurately weighed, finely powdered and the powder corresponding to 20 mg of rutin was warmed with 95% ethanol, filtered and the total volume was brought to 100 ml (200 mcg/ml) with ethanol.

Volumes of standard rutin (200 mcg/ml) solution ranging from 0.5 - 2.5 ml were transferred into a series of 10 ml volumetric flasks. A 3 ml portion of MBTH solution was added to each flask and shaken gently for two minutes. Then 3 ml of ceric ammonium sulphate solution was added successively to each flask and diluted to the mark with distilled water. The absorbance was measured in each case at 500 nm, within the stability period (5- 25 min) against

Table 1 : Estimation of rutin in pharmaceutical preparations

Sample	Labelled amount (mg)	Amount obtained (mg)		% Recovery of the proposed method
		Reported[5] method	Proposed method	
Tablets				
1	50	49.0	49.6	98.8
2	50	49.2	49.4	98.4
3	100	99.2	100.4	99.4
4	100	98.6	99.8	98.4

reagent blank using Shimadzu UV 150-02 (double beam) spectrophotometer. The amount of rutin was then determined from the calibration curve.

Beer's law limits (mcg/ml), molar extinction coefficient (1 $mole^{-1}$ cm^{-1}), Sandell's sensitivity (mcg/cm^2/0.001 absorbance unit), relative standard deviation and percent range of error were found to be 10-50, 2.5254×10^4, 0.2631; 0.6215 and 1.422 respectively. Rutin in several commercial samples (tablets) was determined by the proposed method and the data is presented in Table 1. The values obtained by the proposed method agreed within ± 1.0%.

To evaluate the validity and reproducibility of the method, known amounts of pure drug were added to the previously analysed samples and the mixtures were analysed again by the proposed method and the results are shown in Table 1.

The advantage of using the proposed method is that rutin can be estimated from dosage forms in presence of vitamin C, adrenochrome monosemicarbazone, menadione sodium bisulphate and vitamin D. The usual excipients and adjuncts present in the formulations do not interfere.

The method is simple, sensitive, reproducible and applicable to various pharmaceutical preparations containing rutin. The proposed method can be used in the routine determination of rutin in pharmaceutical preparations.

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