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## Spectrophotometric Method for the Estimation of Linezolid in Tablets

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**Simple visible spectrophotometric method has been developed for the estimation of linezolid from tablet formulation. The method developed is based on formation of chloroform extractable complex of drug with bromocresol green, which shows absorbance maxima at 420 nm, and the system obeyed Beer's law in the concentration range of 0-70 µg/ml of drug. Results of the analysis were validated statistically and by recovery studies.**

Linezolid, chemically (5)-N-(3-(3-fluoro-4(4-morpholinyl)phenyl)-2-oxo-5-oxazolidinyl)-acetamide, is a synthetic bacteriostatic agent used in the treatment of nosocomial infections involving gram-positive organisms<sup>1</sup>. The drug is not yet official in any of the pharmacopoeias. For the estimation of linezolid from biological fluids, few HPLC methods have been reported<sup>2-4</sup>. However, no spectrophotometric method is reported for estimating linezolid in formulations. An attempt has been made in the present study to develop a simple visible spectrophotometric method for the analysis of linezolid from tablet formulation.

An Elico SL 150 UV/Vis spectrophotometer with 1 cm matched quartz cells was used in the present study. All reagents used were of analytical grade. Acid phthalate buffer of pH 2.6 was prepared. Bromocresol green reagent (0.1%) was prepared in buffer of pH 2.6. The reagents were extracted several times with chloroform to remove chloroform soluble impurities. Standard drug solution of linezolid (1 mg/ml) was prepared in chloroform.

For the present method, standard drug solution of linezolid (100 µg/ml) was diluted with chloroform to give several dilutions in concentration range of 0-70 µg/ml of linezolid. To 10 ml of each dilution taken in a separating funnel, 3 ml of bromocresol green reagent was added. Reaction mixture was shaken gently for 5 min and allowed to stand for 5 min so as to separate aqueous and chloroform layer. The chloroform layer was separated out and absorbance measured at 420 nm against reagent blank.

Calibration curve was prepared.

For analysis of dosage form, tablet powder equivalent to 25 mg of linezolid was accurately weighed and transferred to 100 ml volumetric flask. Chloroform (75 ml) was added and shaken for 5 min to dissolve the drug. The solution was filtered through Whatman filter paper No. 41 into another 100 ml volumetric flask. The filter paper was washed with chloroform. The washings were added to the filtrate and final volume was made with chloroform. Ten milliliters of filtrate was further diluted to 100 ml with chloroform. Ten milliliters of final dilution was taken in a separating funnel and treated as per procedure described for the preparation of calibration curve: Absorbance was measured at 420 nm and concentration of drug in sample solution was determined from calibration curve. Optical characteristics were studied.

Recovery studies were carried out by addition of known quantities of standard drug solution to pre-analysed sample at three different concentration levels and the determination was repeated. Results of recovery studies are presented in Table 1.

The proposed method is visible spectrophotometric method for the determination of linezolid from tablet dosage form. The method is very simple and accurate. Reproducibility of the method was checked by recovery studies and results of which found to be close to 100% and values of standard deviation was satisfactorily low. Since no spectrophotometric method is reported for the estimation of linezolid from pharmaceutical formulations, the method developed in the present investigation may perhaps be used for the analysis of linezolid from tablets.

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TABLE 1: ANALYSIS OF LINEZOLID IN TABLET FORMULATION

Method	Batch	Label Claim (mg/tab)	% of Label Claim Estimated*	S.D	% Recovery**
I (BCG)	A	600	98.71	0.682	101.29
	B	600	98.94	0.564	
	C	600	99.02	0.714	

BCG stands for bromocresol Green. \*Denotes average of three determinations. \*\*Denotes average of recovery studies at three different concentration levels. The tablets used were Linox, (600 mg) Unichem Ltd.

The optical characters such as Beer's law limit 0-70 µg/ml, molar absorptivity  $1.3 \times 10^4$  l/mol/cm, Sandell's sensitivity  $0.0227 \mu\text{g}/\text{cm}^2/0.001$  absorbance unit, slope 0.0084, intercept 9.9991 correlation coefficient is 1.02 and relative standard deviation is 0.3059. The colour of the complex formed has been found to be stable for 8 h. The drug dye ratio is 1:1.

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## HPLC Analysis of Withaferin A in *Withania somnifera* (L.) Dunal

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**A reversed phase liquid chromatographic method for analysis and quantitative estimation of withaferin A in roots of *Withania somnifera* (L.) Dunal collected from different geographical zones, has been developed using a symmetry C18 column and a binary gradient profile. The various aspects of analysis such as extraction, efficiency, detection limits, reproducibility and peak purity were validated using photodiode array detector.**

The roots of *Withania somnifera* (L.) Dunal (Family: Solanaceae) is commonly known as *Ashwagandha* have been employed in Ayurveda and Unani system of medicine as nervine tonic. This plant is reported as an antistress, antiinflammatory, antitumor and CNS depressant agent.

Withaferin A was isolated from species of *Withania*<sup>1</sup> and from *Acnistus arborescens*<sup>2-3</sup>. It is reported to be an antibiotic<sup>4</sup>, anticancer agent<sup>5</sup> and a radiosensitizer<sup>6</sup>. In present study attempts were made to develop a reliable, simple and reproducible method for extraction of withanolides and their quantitative estimation in roots of *Withania somnifera*.

Withaferin A was purchased from Natural Remedies

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