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## Study on the determination and chiral conversion of R-salbutamol in human plasma and urine by chiral liquid chromatography-tandem mass spectrometry

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A sensitive chiral liquid chromatography-tandem mass spectrometry (LC-MS/MS) method was developed for determination of salbutamol enantiomers in human plasma and urine. The chiral conversion of R-salbutamol during the analysis procedure was fully investigated by studying the effects of analysis parameters on the chiral conversion, including pH of the solution, operation temperature, and operation time. Furthermore, the predicted chiral conversion ratio of R-salbutamol calculated by the fitted model under practical conditions was 0.0%, which means the chiral conversion of R-salbutamol determined in this study was not caused by the analysis procedure, but resulted from the *in-vivo* chiral conversion of R-salbutamol. All the samples were separated on an Astec Chirobiotic T column and detected by a tandem mass spectrometer in multiple reaction monitoring mode. Lower limit of quantification of 0.100 ng/mL was achieved under the optimized conditions. This validated method afforded good linearity, repeatability, accuracy and stability. In addition, this method has been successfully applied to the clinical pharmacokinetic study of R-salbutamol in healthy volunteers. According to the results, this chiral LC-MS/MS assay provides a suitable and robust method for the bioanalysis of salbutamol enantiomers, and the study of the effects of analysis conditions on the chiral conversion has a certain guiding significance for the determination of chiral drugs.

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## Evaluation of high performance liquid chromatography, gas chromatography mass spectrometry of fractions of Viburnum opulus (L) and toxicological studies on male albino Wistar rats

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This study was conducted to evaluate the phytochemical constituent of *Vibrunum opulus* (L) with the aid of qualitative screening, high performance liquid chromatography (HPLC) and gas chromatography mass spectrometry (GC-MS). The study also evaluated the effect of *V. opulus* on different strains of micro-organism and the safety potential of the leaf on albino Wistar rats (AWR) using biochemical and histological indices of toxicity. Ethanol, n-hexane, ethyl acetate, butanol and water fractions were prepared for both phytochemical and anti-microbial activity. Five groups of seven male AWR per group were used for the study. Group A was administered with distilled water and was used as the control group, while groups B, C, D, E were respectively administered with 250, 500, 1000 and 1500 mg/kg body weight of the ethanolic leaf extract of *V. opulus* by gastric intubation for 28 days. Phytochemical screening revealed the presence of carbohydrate, tannins, saponin, alkaloids, terpenoids, coumarins, phenols, caryophyllene, germacrene D, naphthalene, diethyl phthalate, neophytadiene, butane,1,1-dibutoxy-, pentadecane, 2,6,10,14-tetramethl, octadecane, and tridecane screened with the aid of HPLC as obtained from GCMS. Animals were subsequently anesthetized, blood samples were collected for biochemical assays; organs were isolated and weighed, while the liver tissues were processed for histopathological studies. Alkaline phosphatase (ALP), high density lipoprotein, low density lipoprotein, cholesterol and total protein were significantly ($p<0.05$) elevated in animals administered with 500, 1000 and 1500 mg/kg body weight of the extract. Ethanol, butanol and aqueous fraction of the leaf of *V. opulus* showed significant effect on *Klebsiella pneumoniae pneumonia* and *Klebsiella ozaenae* strain of micro-organism. Histopathological studies conducted revealed that there was no significant damage on the liver tissues. The result suggests that extract of the leaf of *V. opulus* contains a wild range of fatty acids, heterocyclic compound which have antimicrobial properties, so that it can be recommended as a plant of phytopharmaceutical importance and the extract of the leaf of *V. opulus* could alter some biochemical parameters and may not cause any adverse effect on the liver tissue.

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