World Academy of Science, Engineering and Technology
International Journal of Bioengineering and Life Sciences
Vol:9, No:12, 2015

Development and Validation of a HPLC Method for 6-Gingerol and 6-Shogaol in Joint Pain Relief Gel Containing Ginger (Zingiber officinale)

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Abstract : High-Performance Liquid Chromatography (HPLC) method was developed and validated for simultaneous estimation of 6-Gingerol(6G) and 6-Shogaol(6S) in joint pain relief gel containing ginger extract. The chromatographic separation was achieved by using C18 column, 150 x 4.6mm i.d., 5µ Luna, mobile phase containing acetonitrile and water (gradient elution). The flow rate was 1.0 ml/min and the absorbance was monitored at 282 nm. The proposed method was validated in terms of the analytical parameters such as specificity, accuracy, precision, linearity, range, limit of detection (LOD), limit of quantification (LOQ), and determined based on the International Conference on Harmonization (ICH) guidelines. The linearity ranges of 6G and 6S were obtained over 20-60 and 6-18 µg/ml respectively. Good linearity was observed over the above-mentioned range with linear regression equation Y= 11016x- 23778 for 6G and Y = 19276x-19604 for 6S (x is concentration of analytes in µg/ml and Y is peak area). The value of correlation coefficient was found to be 0.9994 for both markers. The limit of detection (LOD) and limit of quantification (LOQ) for 6G were 0.8567 and 2.8555 µg/ml and for 6S were 0.3672 and 1.2238 µg/ml respectively. The recovery range for 6G and 6S were found to be 91.57 to 102.36 % and 84.73 to 92.85 % for all three spiked levels. The RSD values from repeated extractions for 6G and 6S were 3.43 and 3.09% respectively. The validation of developed method on precision, accuracy, specificity, linearity, and range were also performed with well-accepted results.

Keywords : ginger, 6-gingerol, HPLC, 6-shogaol
Conference Title : ICMAP 2015 : International Conference on Medicinal and Aromatic Plants
Conference Location : Penang, Malaysia
Conference Dates : December 03-04, 2015