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A Novel Approach to the Quantitation of Coeluting Cantharidin and Deuterium Labelled Cantharidin in Blister Beetles (Coleop-tera: Meloidae)

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Abstract:

Blister beetles (Coleoptera: Meloidae) are the main natural source of cantharidin, but the compound titre is depended on several factors including, age, sex and mating status of the insects. In order to eliminate such uncertainty factors in physio¬logical and chemical studies deuterium labelled cantharidin (D2C) with no natural abundance is normally introduced into the beetles' body to use it as a model for studying the cantharidin behaviour in vivo. Experiments were achieved on Mylabris quadripunctata (Col.: Meloidae) from Southern France and the beetles were exposed to an artificial diet containing a de¬fined amount of D2C. On the other hand, because of the high similarity between the two compounds they cannot be well quantified by gas chromatography. In order to remove the burden, MRM technique was used for the first time which could successfully create well-defined cantharidin and D2C peaks and hence a precise measurement. MRM technique was exam¬ined using a GC-MS Varian Saturn which collected MS/MS data of more than one compound in the same time window of the chromatogram. It is especially useful when coeluting compounds have different parent ions, i.e. m/z 84 for D2C (coelut¬ing isotopically-labelled compound) and m/z 82 for cantharidin (beetle-originated compound). Using the routine GC-MS runs, measurement accuracy may be significantly reduced because the D2C peak is covered by the cantharidin huge peak while MRM could reveal the two coincided peaks of cantharidin and D2C. Therefore MRM is hereby introduced as the method of choice to separate cantharidin from D2C with high sensitivity and thus provide a precise base of quantitation.

Keywords:

Labelled cantharidin ، GC-MS/MS ، MRM

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