Validation of an LC method to estimate skin retention of flavonoids from nanoemulsions containing *Achyrocline satureioides* extract

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Keywords: *LC; nanoemulsion; permeation*

Introduction: Nanocarriers have been considered as topical delivery systems for medicinal plant extracts. The development of nanoemulsions containing hidroethanol extracts of *Achyrocline satureioides* - Asteraceae (AS) is under investigation by our research group. This study describes the validation of an LC method to estimate the skin retention of AS flavonoids (i.e. quercetin, luteolin, and 3-*O*-methylquercetin) from topical nanoemulsions.
Materials and methods: Nanoemulsions containing AS hidroethanolic extract were prepared through spontaneous emulsification method. The skin penetration of flavonoids from nanoemulsions was evaluated using Franz type diffusion cells. The validation parameters were based on the previous results reported by Bica and colleagues (Master thesis, PPGCF/UFRGS, 2009) according to ICH (2005) and FDA guidelines (2001).
Results and Discussion: The specificity was assessed through the comparison of the flavonoid peaks retention time in the presence of skin extracts. The chromatograms showed that the method is specific since no interference of formulation and skin components could be observed and since no peak was detected in the flavonoids retention time. The LC method was linear in a range of 0.25 to 10 µg/mL exhibiting a coefficient of determination above 0.999 for all flavonoids. The low limit of quantification obtained was 0.25 µg/mL. Satisfactory precision could be observed; the intra and inter-day precision was from 1.20 to 6.73% (at 0.25 µg/mL) and from 0.02 to 0.96% (at 10.0 µg/mL). The flavonoids recovery from nanoemulsion and skin matrices was comprised between 90.05 and 109.88%. In the retention assay, 0.54±0.10 of quercetin, 0.65±0.06 of luteolin and 1.81±0.19 µg/cm^2 of 3-*O*-methylquercetin were detected into the skin after 8 hours of kinetics.
Conclusion: The LC method was suitable for the determination of the main flavonoids of AS in skin retention studies from topical nanoemulsions.
Acknowldgements: Financial support CAPES Rede Nanobiotec-Brasil (774/2009).