

Quality Assessment of Espinheira-Santa Phytomedicines Using ^1H NMR Spectroscopy and Principal Component Analysis

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“Espinheira-Santa” (*Maytenus ilicifolia* and *Maytenus aquifolium*, Celastraceae) leaves are utilized in Brazilian health programs as alternatives to the more expensive synthetic anti-ulcer drugs, because of their proven activity against gastritis and gastric ulcers¹. However the species *Sorocea bonplandii* (Moraceae)² and *Zollernia ilicifolia* (Fabaceae)³ are common adulterants for these medicinal plant due to their morphological similarity. Sometimes the accurated morphological evaluations are limited in the case of crushed or powered drugs so ^1H NMR and chemometric analysis could be an alternative for quality control of crude drugs.

In this work we analyse samples with official botanical classification of *M. ilicifolia*, *M. aquifolium*, *Sorocea bonplandii* and *Zollernia ilicifolia* species and some commercial samples by using liquid ^1H NMR. The spectra data showed after PCA that the samples sold in Brazilian market are not from *M. ilicifolia* or *M. aquifolium*. It is possible to observe that some of them are close with *Zollernia ilicifolia* and *Sorocea bonplandii* and most of them are completely different from these species. In this case, probably, it will be a different plant species.

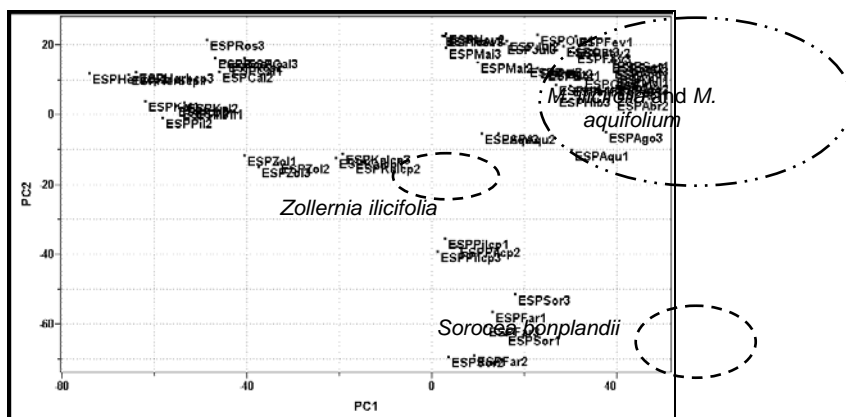


Figura 1: Score plot of ^1H NMR data: PC1 (29.9%) vs PC2 (13.8%).

These preliminary results open the possibility that the NMR/Multivariate Analysis might be a powerful combination, when applied to a suitably enlarged group of samples, to provide rapid information about quality control for phytotherapeutic medicines.

The ^1H NMR data were acquired in BRUKER 9.4 Tesla equipment and all measurements were done in triplicate using a 5 mm inverse detection probe and the multivariate analyses were done using Pirouette[®] (v. 2.7, Infometrix, USA). The analyzed teas were prepared by pouring boiling water (50mL) on dried leaves (3g).

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References

- ¹ Oliveira M.; Monteiro M.; Macaubas C.; Barbosa V.; Carlini E. J. *Ethnopharmacology* **1991**, *34*, 29-41.
- ² Vilegas J.H.; Lanças, F. M. *Phytotherapy Research* **1994**, *8*, 241-244.
- ³ Leite, J.P.V. *et al.* *J.Agric.Food Chem.* **2001**, *49*, 3796-3801.