

DEVELOPMENT AND VALIDATION OF A DISCRIMINATIVE METHOD FOR ANTHRACYCLINES USED IN ONCOLOGY BY VISIBLE SPECTROMETER

¹CA Adade*, ²A El Orche, ¹H Attjioui, ³A Cheikh, ⁴H Mefetah, ¹M El Karbane, ^{1,4}M Bouatia.

¹Mohamed V University-Faculty of Medicine and Pharmacy, Analytical Chemistry Laboratory, Rabat, Morocco;

²University of Sultan Moulay Slimane Beni-Mellal, Faculty of Science and Technology, Beni-Mellal, Morocco;

³Abulcasis University of Health Sciences, Faculty of Pharmacy, Rabat, Morocco;

⁴Paediatric Hospital, Pharmacy, Rabat, Morocco



Background and importance

Anthracyclines are among the most used anticancer drugs in haematology–oncology, especially in the treatment of solid tumours and leukaemia. High performance liquid chromatography coupled with spectrometry is a well established method in the control of hospital chemotherapy preparations. However, it remains an expensive method, especially in low income countries.

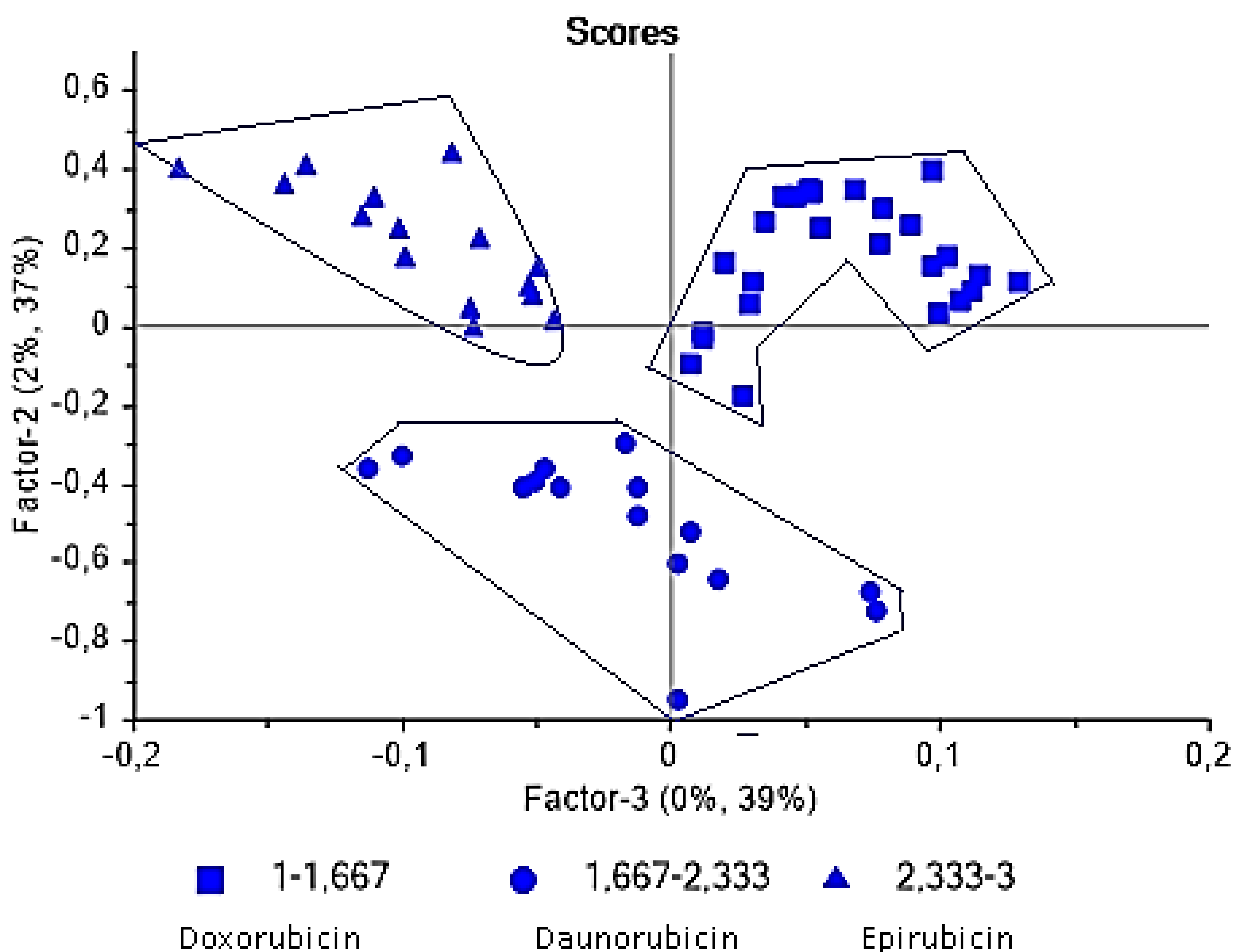
In recent years, UV visible spectrometry associated with partial least square discriminant regression has been used as a method for qualitative and quantitative analysis of drugs in the same therapeutic or physicochemical class.

Aim and objectives

The aim of the study was to develop a rapid spectrophotometric method for the discrimination of anthracyclines used in chemotherapy in a paediatric haematology – oncology centre by combining UV visible and partial least square analysis (PLS-DA).

Results

- ✓ The model discriminated between the three compounds with a calibration error RMSEC of 0.098 and a regression coefficient of 0.96.
- ✓ All validation samples were correctly assigned with 100% accuracy.



Conclusion and relevance

This study demonstrated the potential of screw spectrometry associated with the PLS-DA chemometric tool for anthracycline discrimination. It is promising because of its low acquisition cost, speed and ease of use. A calibration range of drug concentrations could allow quantitative control of chemotherapy preparations in the hospital.

References

C. Bazin, B. Cassard, E. Caudron, P. Prognon, and L. Havard, "Comparative analysis of methods for real-time analytical control of chemotherapies preparations," *International Journal of Pharmaceutics*, vol. 494, no. 1, pp. 329–336, 2015.