

Stability Assessment of Resveratrol Tablets Stored under Stress Conditions by Directional-Hemispherical Reflectance

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INTRODUCTION

Resveratrol is a natural polyphenol found in many vegetables and fruits. Scientific reports have demonstrated its broad pharmacological activity, including cardioprotective, anti-cancer, anti-microbial, anti-ageing, antioxidant, immunomodulatory and neuroprotective effects [1,2,3]. However, due to its low solubility, as well as its sensitivity to light and elevated temperature, it is susceptible to configuration transformation and rapid degradation. Various analytical techniques are used to assess the stability of solid drug forms. The aim of this work was to assess the stability of tablets containing this natural polyphenol, after storage under stress conditions, using hyperspectral analysis (THR).

METHOD

To test the suitability of THR to monitor the stability of the tablets under study, the formulations were stored in a Solarbox 1500 chamber (COFOMEGRA Srl, Milan, Italy) for different periods of time (1 day, 5 days) at two different temperatures (20°C, 45°C), yielding three storage conditions.

Twenty tablets were tested at each time point, and the results obtained were subjected to statistical analysis.



The photostability test was performed in accordance with ICHQ1B guidelines. SOC-410 Directional Hemispherical Reflectometer (Surface Optics Corporation, USA) was used to determine the total reflectance of tested tablets bands in the spectral range of 335–2500 nm.

RESULTS

Storage of the tested tablets under stress conditions (heat, UV exposure) resulted in a significant decrease in THR across the entire spectrum of analyzed wavelength ranges, compared to the values obtained on day 0 (control) (Table 1).

Table 1. Comparison of the mean THR values determined for test tablets stored under different stress conditions with obtained for control tablets.

Spectral ranges (nm)	22°C, 1 day UV radiation	45°C, 1 day UV radiation	45°C, 5 day UV radiation
335-380	<0.001	<0.001	<0.001
400-450	<0.001	<0.001	<0.001
480-600	<0.001	<0.001	<0.001
590-720	<0.001	<0.001	0.6445
700-1100	0.0295	<0.001	0.0078
1000-1700	0.0179	<0.001	0.0217
1700-2500	0.0061	<0.001	0.0045

The exception was tablets stored at 45°C for 5 days, for which there was a significant increase in THR for the ranges: 700-1100nm (p=0.0078), 1000-1700nm (p=0.0217), 1000-1700nm (p=0.0217) (Figure 1).

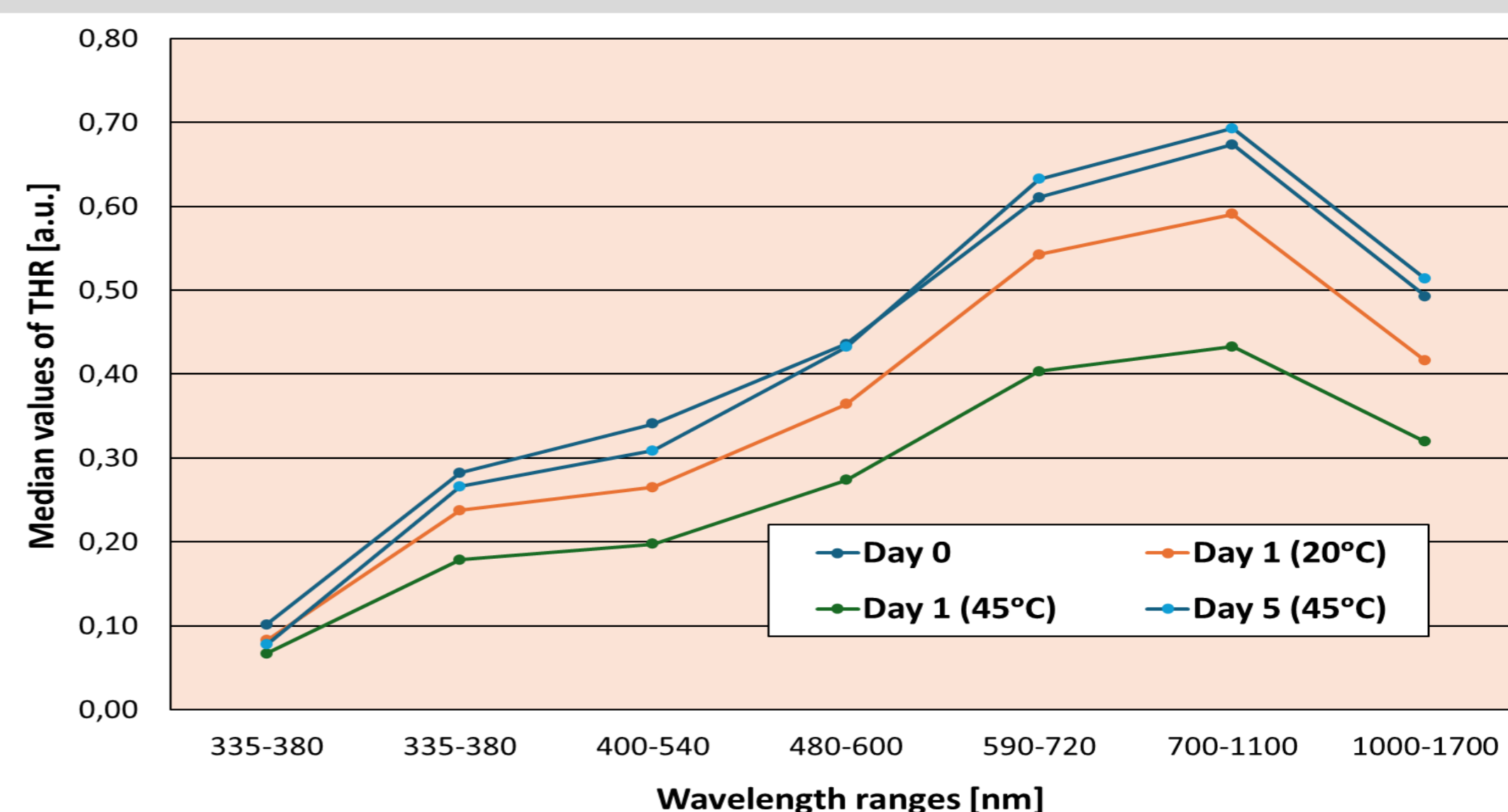


Figure 1. Graphs showing mean values of THR for analyzed tablets stored under different stress conditions.

CONCLUSION

The present study showed that during storage under stressful conditions (heat and UV radiation), more light was transferred to the interior of the tablet matrix, which may have been due to changes in its physico-chemical parameters.

REFERENCES

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