EVALUATING THE CARDIOPROTECTIVE EFFECTS OF USNIC ACID AGAINST DOXORUBICIN-INDUCED CARDIOTOXICITY IN RATS

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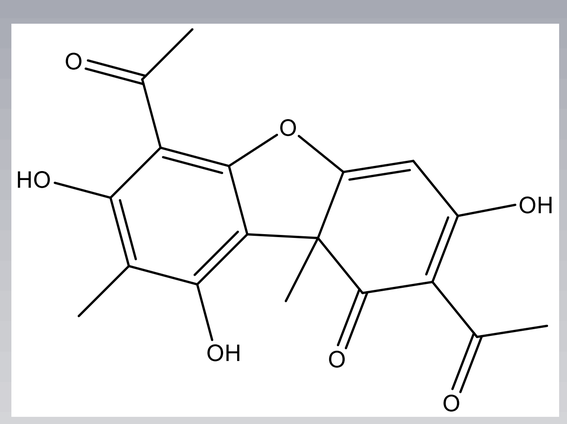
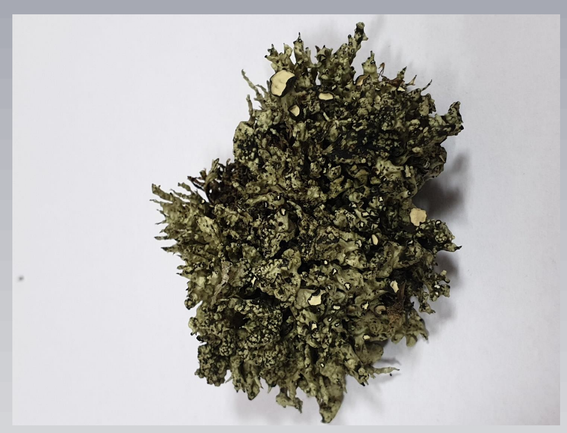
Introduction

Usnic acid (UA) is a natural, dibenzofuranic secondary metabolite found in various lichens and has been widely studied for its biological activities. Its importance stems from its potential therapeutic uses, including antimicrobial, antitumor, and antioxidant effects. Although lichens containing UA are used in traditional medicine and numerous beneficial effects of usnic acid have already been confirmed, there is still insufficient data on its cardioprotective effects..

The aim of this study was to evaluate the effect of UA on doxorubicin-induced cardiotoxicity in rats.



USNIC ACID



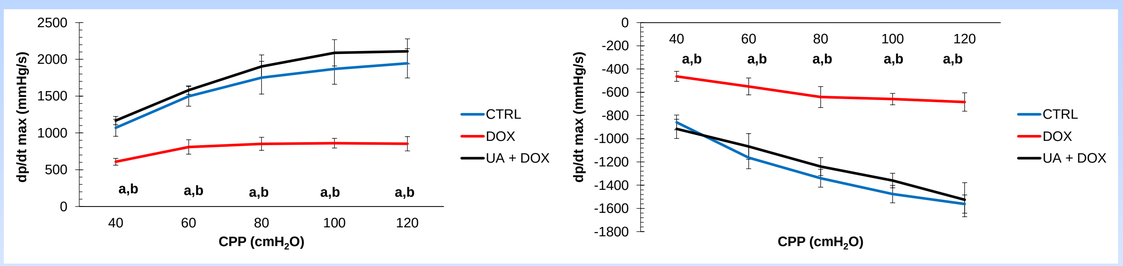
LICHEN *XANTHOPARMELIA STENOPHYLLA*

Methodology

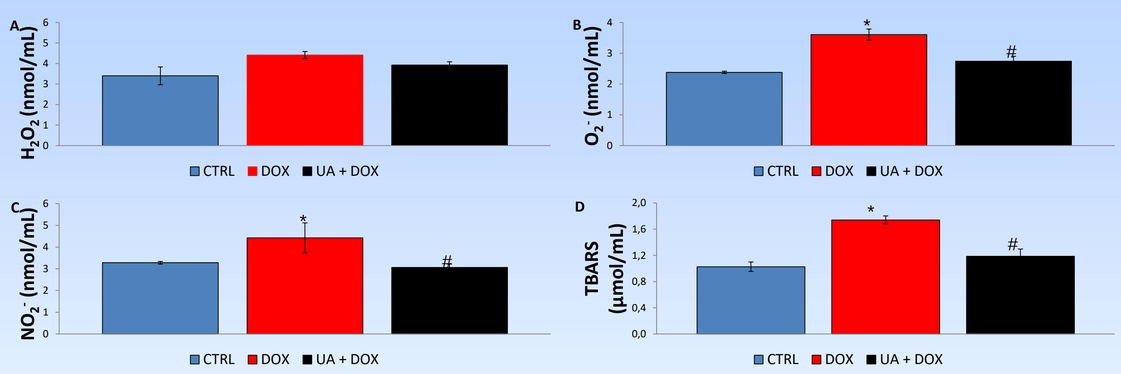
UA was extracted from the acetonic extract of lichen *Xanthoparmelia stenophylla* (XSA) and identified by comparison with the standard. The study was conducted on 40 male *Wistar albino* rats. The UA was administered orally at a dose of 25 mg/kg for 28 days. After 28 days, doxorubicin was administered intraperitoneally at a cumulative dose of 15 mg/kg. Three days after doxorubicin administration, hearts were isolated and subjected to *ex vivo* examination on a Langendorff apparatus. Blood was collected in order to determine the markers of oxidative stress by spectrophotometric method.

Results

Cardiodynamics



Pro-oxidative markers



Antioxidant markers

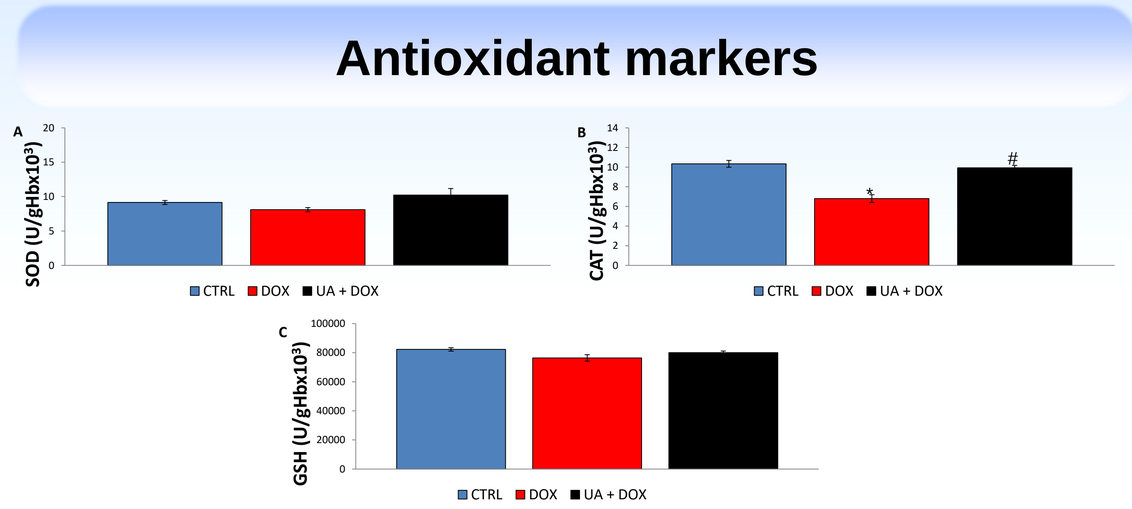


Figure legends:
The values are presented as mean ± SD. CTRL - control group; DOX - doxorubicin treated group; UA + DOX – Usnic acid and doxorubicin treated group; Level of significance between groups ($p<0.05$): a-CTRL vs. DOX; c-UA+DOX vs. DOX; e-CTRL vs. UA+DOX; *- significant difference between groups CTRL and DOX; # - significant difference between groups UA + DOX and DOX;

Conclusion

Our results showed that UA exhibits cardioprotective and antioxidant activity, which indicates that UA can potentially be used as a cardioprotective agent. The mechanisms by which the cardioprotective effect is achieved should be examined in future studies.