

THE SKIN COLOR OF ORNAMENTAL KOI CARP ARE REGULATED VIA PLASMA CAROTENOID-RELATED METABOLITES UNDER ACUTE TEMPERATURE FLUCTUATIONS

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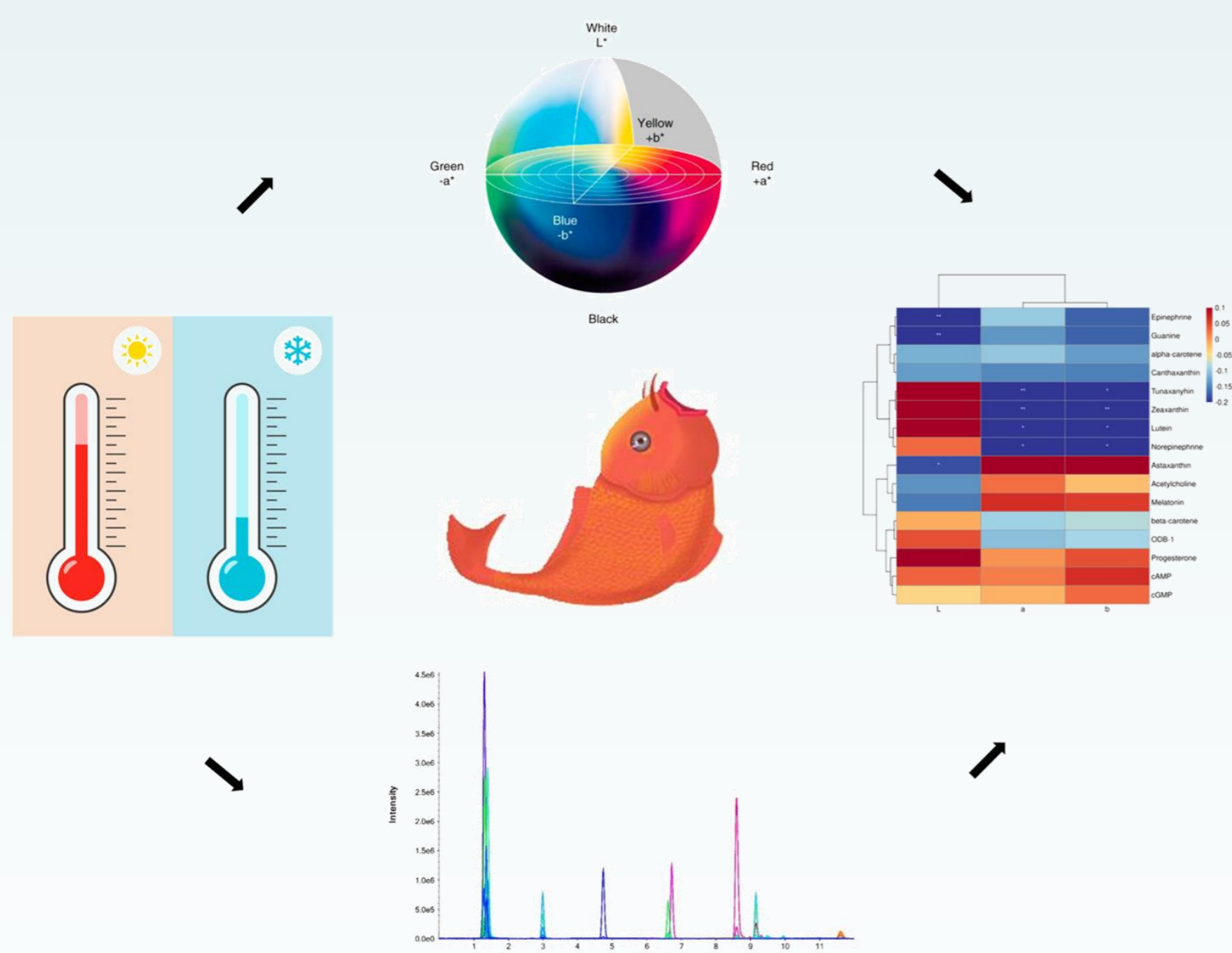
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Introduction

- The skin color of koi carp (*Cyprinus carpio* L.) is one of the traits that most influence their ornamental and economic values. The skin color change caused by temperature fluctuation has been noticed as a common phenomenon for a long time in koi aquaculture. But nevertheless, little was reported about the detailed temperature-color correlation and the underlined regulation mechanism.
- In this study, the effects of acute temperature fluctuations on koi skin color via action in carotenoids and related metabolites were investigated by the combination of quantitative evaluation of skin color and targeted metabolomics analysis.

Methods

- Five varieties of koi carp were maintained under high (25°C-30°C-25°C) or low temperature (25°C-20°C-25°C) fluctuations.
- The skin color was evaluated by a CIELab color space method for lightness, red hue and yellow hue.
- A targeted metabolomics procedure based on liquid chromatography tandem mass spectrometry with multiple reactions monitoring was constructed to analyze carotenoids and related metabolites in the koi plasma.



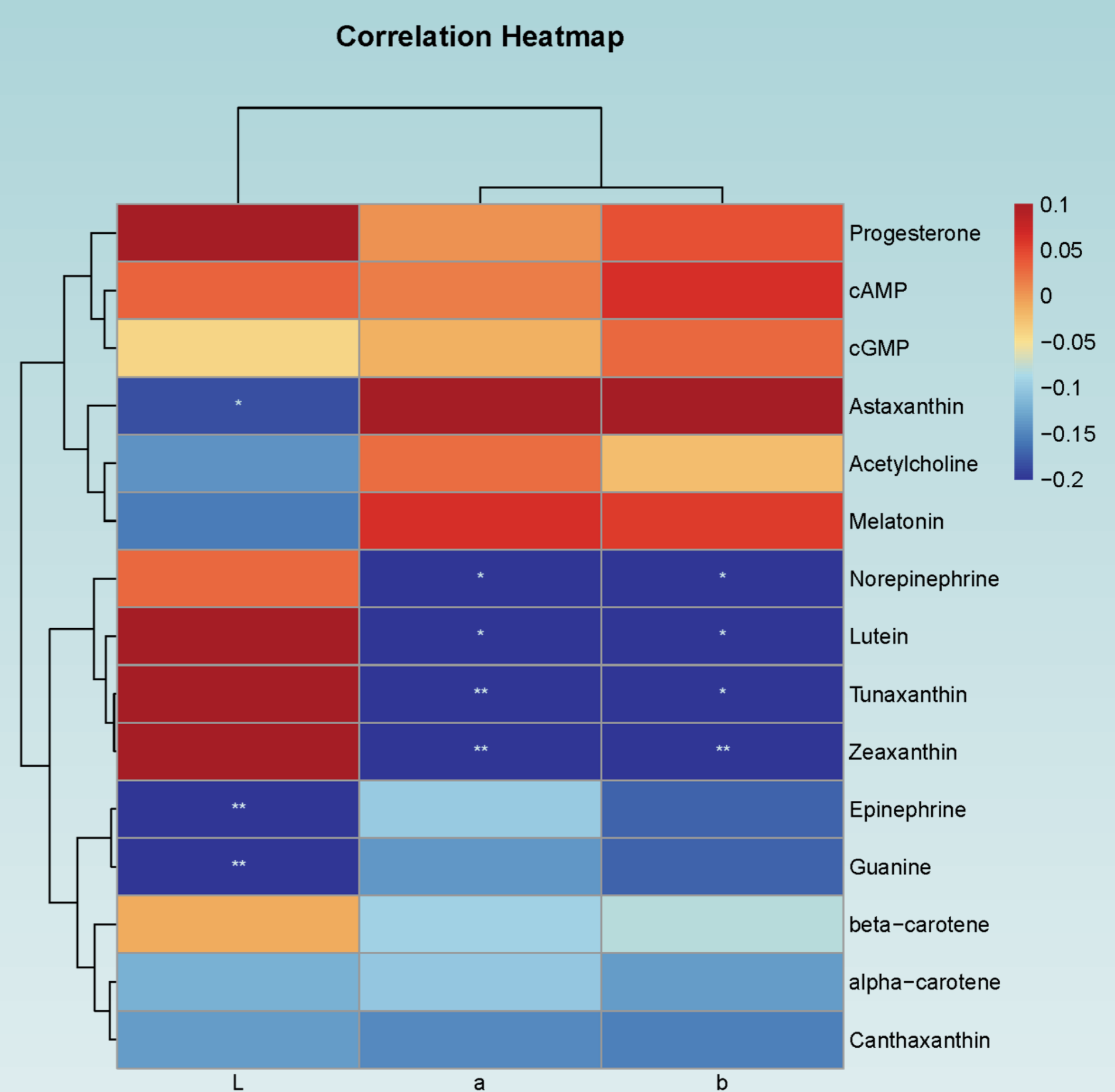
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Results

- Correlation analysis revealed that the koi skin lightness was negatively correlated with the plasma guanine content.
- The results also suggested that oxycarotenoids might be favorable for enhancing koi skin color saturation, including red hue and yellow.



Acknowledgement

- Beijing Innovation Consortium of Agriculture Research System (BAIC07-2024)
- BAAF Innovation Capacity Building Foundation of Research on Innovation and Biotechnology of Fish Germplasm Resources (KJCX20230122)
- BAAF Special Foundation for Reform and Development (JJPY-2024-01)



<https://doi.org/10.1016/j.ecoenv.2024.116165>