

# ANTHOCHLOR PIGMENTS AND THEIR POTENTIAL USE IN BEVERAGES

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## **Introduction:**

Yellow flower coloration appeared as an adaptation to the colour sense of insects in order to attract them as pollinators. Many Asteraceae species accumulate carotenoids as well as chalcones and aurones which are known as anthochlor pigments. Plants synthesize aurones by oxidation and cyclization of chalcones. Though anthochlors are frequently ranked among flavonoids, their structure cannot be derived from the flavonoid skeleton [Fig. 1]. Two types of anthochlors are distinguished into deoxy- and hydroxyl-types, depending on the presence of a hydroxyl group in ring A at position 6' of chalcones and position 4 of aurones. Especially aurones, have been reported to possess various beneficial effects, such as antibacterial, anti-inflammatory and anticancer activities. These properties are assigned mainly due to their antioxidant activity based on their structure [1] [2].

## **Material & Methods:**

Detection of anthochlor pigments in petals was done by exposure to ammonia. Blossoms with stem were put in glasses filled with little amounts of ammonia, allowing the alkaline vapour to diffuse through the petals resulting in the characteristic color switch of anthochlors [3]. The color shift of the anthochlor pigments at different pH conditions were measured via spectrophotometry. 0.1mM Butein (a chalcone) and sulfuretin (an aurone) in 0.1mM NaH<sub>2</sub>PO<sub>4</sub>-Puffer at pH 8 and pH4, respectively was measured at a DU800 spectrophotometer (Beckman Coulter).

## **Results and Conclusion:**

Ammonia staining of blossoms of *Bidens ferulifolia* (Jacq) showed a clearly visible colour switch from yellow to red-brown. Measurements done via spectrophotometry showed a bathochromatic shift of approximately 100nm from the violet to the blue range of the spectrum, resulting in a colour change from yellow to orange and red [Fig. 2]. This is due to the pH dependent transition of the undissociated phenol groups to phenolates. We suggest to evaluate the exploitation of this color change for potential use in diets. Two parts, one containing dissolved or flower extracts anthochlors in either slightly acidic or alkaline form (liquids, fizzy tablet and others) and the other part containing the converse result in a color shift when mixed together. Both, the beneficial and optical properties of aurones should be utilized in the creation of innovative and healthy beverages such as sports drinks or spectacular bar drinks and cocktails.

## Acknowledgement

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## References:

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[2] Jagtap, S.V. and Khan, A.A., *Synthesis and biological activities of aurones: A Review*, *Int. J. Pure App. Biosci.* 4(2): 137-155 (2016). doi: <http://dx.doi.org/10.18782/2320-7051.2230>

[3] Otto, G., Fysiografiska, K., Saellskapets, I. and Foerhandlingar, L. (1939): *The distribution of anthochlor in the Compositae*, *Journal written in German*, 8: 62-70

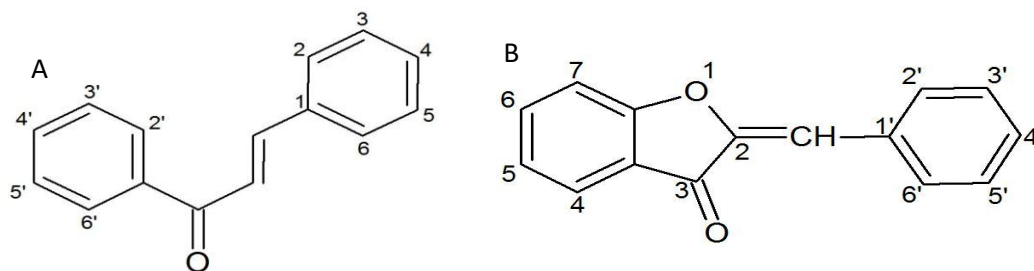


Fig. 1: Basic structure of chalcones (A) and aurones (B)

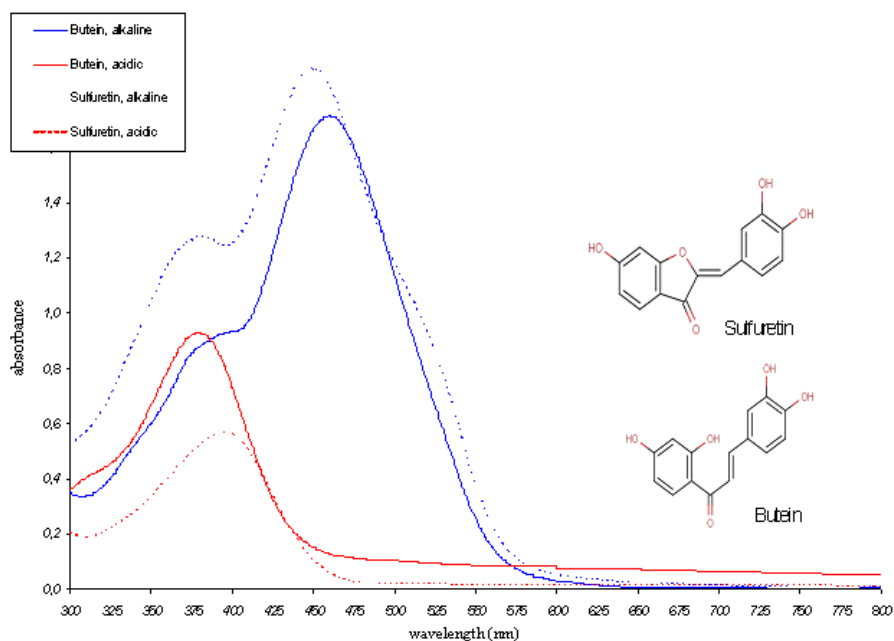


Fig. 2: Spectrophotometry: Changes of light absorbance of the chalcone butein and the aurone sulfuretin in dependence of the pH