

ANTHOCYANIN PIGMENTS ACTIVITY AND METABOLISM IN THE ORAL CAVITY

M. M. Giusti^{*}, K. Kamonpatana², P. Kumar, M. L. Failla

¹) The Ohio State University, Dept of Food Science and Technology,
Columbus, United States

²) The Ohio State University, Dept of Human Nutrition,
Columbus, United States

Consumption of anthocyanins (Antho) and Antho-rich materials has been associated with protection against chronic diseases. Anthocyanin absorption may occur in the stomach and intestines, however, lately Antho consumption has been linked with chemoprotection in the oral cavity. Our goal was to improve our understanding of the stability, metabolism and bioavailability of Antho in the oral cavity. Antho-rich extracts from blueberry, chokeberry, black raspberry, red grape, and strawberry were incubated ex-vivo with human saliva from healthy subjects, as well as with artificial saliva. In addition, either red grape juice or chokeberry juice was retained in the oral cavity of healthy human participants for 5 min in a randomized crossover design. Retained juice, oral washings and buccal scrapings were collected. HPLC-PDA-ESI-MS was used to evaluate stability of ACN in oral cavity, their binding to the mucus layer of buccal scrapings and their uptake into buccal epithelial cells. All Antho were partially degraded in saliva. Glycosides of delphinidin and petunidin were more susceptible to degradation than other Antho tested (5). The number of glycosylations significantly affected Antho stability in saliva. Antho degradation decreased by heating saliva to 80°C, after removal of cells and after oral rinsing with antibacterial chlorhexidine. Relatively less delphinidin and petunidin glucosides were associated with buccal mucus and epithelial cells than other Antho tested, while Cyanidin-3-glucoside preferentially accumulated in buccal epithelium. These results suggest that Antho degradation in the mouth is structure-dependent and largely mediated by oral microbiota, and should be considered when formulating products for oral health.

Keywords: Anthocyanins pigments, oral cavity, antho-rich

* Corresponding author: giusti.6@osu.edu