

PP14. Carotenoid-related volatile compounds of tobacco (*N. tabacum* L.) essential oils

Venelina Popova¹, Tanya Ivanova¹, Tsvetko Prokopov¹, Milena Nikolova¹,
Albena Stoyanova¹, *Valtcho D. Zheljazkov*^{2*}

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Tobacco (*Nicotiana tabacum* L.) aroma is an important quality attribute of tobacco and consists of a variety of minor components, among which carotenoid degradation products. The transformation of tobacco carotenoids (mainly lutein and β -carotene) occurs both in fresh green leaves and during curing, thus producing nearly 100 different short-chained metabolites. The three major tobacco types traditionally produced in Bulgaria and used as blends in the manufacture of cigarettes, include oriental (*OR*), flue-cured Virginia (*FCV*), and Burley (*BU*). High-quality Bulgarian oriental tobacco is also processed to obtain concrete and absolute, which are used in fine perfumery. Therefore, the objective of this work was to determine the content of the most important fragrance-shaping carotenoid degradation products in the essential oils (EOs) of the three types of Bulgarian tobacco, and to compare them with other aroma products from tobacco.

The content of total carotenoids and β -carotene was highest in the air-cured *BU* tobacco (22.23 and 20.34 mg/100 g, respectively), followed by the sun-cured *OR* (13.60 and 12.09 mg/100 g in variety "Plovdiv 7" (*Pd7*); 6.27 and 5.45 mg/100 g in "Krumovgrad" (*Kr*), and *FCV* (5.93 and 3.73 mg/100 g). Tobacco EOs were obtained by hydrodistillation in an acidified medium, and the yields were: *FCV* - 0.23%; *BU* - 0.26%, *OR* - 0.44% (*Kr*) and 0.30% (*Pd7*). All EOs were light yellow and had a sharp odor: *FCV* – very intense, balsamic, woody with earthy undertones; *BU* – mild woody with balsamic and floral-like undertones, and *OR* – very green with slightly smoky and mossy-like and honey-like undertones. The main aroma-impact compounds from carotenoid degradation identified in the EOs (by GC-MS) were as follows: *FCV* - α -ionone (1.4%), dihydro- β -ionone (2.2%); β -damascenone (2.9%); *BU* - α -ionone (1.9%), dihydro- β -ionone (3.1%); β -damascenone (3.5%); *OR(Kr)* - α -ionone (0.9%), β -ionone (2.8%), dihydro- β -ionone (5.9%); β -damascenone (1.6%); *OR (Pd7)* - α -ionone (4.3%), dihydro- β -ionone (5.2%); β -damascenone (3.7%). Compared to published data for other tobacco EOs, these results reveal some differences in damascone derivatives, explainable by plant material origin and processing conditions. Ionone and its derivatives were not identified in the aroma extraction products concrete and resinoid from the same tobaccos, neither in the absolute from the Bulgarian tobaccos. The results agree with previous findings about the effect of thermal degradation, pH of the medium and other factors on carotenoid transformations in plant materials. The study provides an insight into the composition of EOs from the tobaccos produced in Bulgaria, and may be of interest to the fragrance industry.

¹University of Food Technologies, 4002 Plovdiv, Bulgaria; ²Oregon State University, Corvallis, OR 97331, USA.

*Corresponding author: Valtcho.Jeliazkov@oregonstate.edu