

Composition of the cuticle of developing sweet cherry fruit

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The composition of wax and cutin from developing sweet cherry (*Prunus avium*) fruit was studied by GC–MS between 22 and 85 days after full bloom (DAFB). In this and our previous study, fruit mass and surface area increased in a sigmoidal pattern with time, but mass of the cuticular membrane (CM) per unit fruit surface area decreased. On a whole fruit basis, mass of CM increased up to 36 DAFB and remained constant thereafter. At maturity, triterpenes, alkanes and alcohols accounted for 75.6%, 19.1% and 1.2% of total wax, respectively. The most abundant constituents were the triterpenes ursolic (60.0%) and oleanolic acid (7.5%), the alkanes nonacosane (13.0%) and heptacosane (3.0%), and the secondary alcohol nonacosan-10-ol (1.1%). In developing fruit triterpenes per unit area decreased, but alkanes and alcohols remained essentially constant. The cutin fraction of mature fruit consisted of mostly C16 (69.5%) and, to a lower extent, C18 monomers (19.4%) comprising alkanolic, α -hydroxyacids, α,α -dicarboxylic and midchain hydroxylated acids. The most abundant constituents were 9(10),16-dihydroxy-hexadecanoic acid (53.6%) and 9,10,18-trihydroxy-octadecanoic acid (7.8%). Amounts of C16 and C18 monomers per unit area decreased in developing fruit, but remained approximately constant on a whole fruit basis. Within both classes of monomers, opposing changes occurred. Amounts of hexadecandioic, 16-hydroxy-hexadecanoic, 9(10)-hydroxyhexadecane-1,16-dioic and 9,10-epoxy-octadecane-1,18-dioic acids increased, but 9,10,18-trihydroxy-octadecanoic and 9,10,18-trihydroxy-octadecenoic acids decreased. There were no qualitative and minor quantitative differences in wax and cutin composition between cultivars at maturity. Our data indicate that deposition of some constituents of wax and cutin ceased during early fruit development. ©2007 Elsevier Ltd. All rights reserved.