

红果肉与白果肉杨梅花青苷和糖代谢途径的差异蛋白研究

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Differential Expression Proteins of Anthocyanin and Carbohydrate Pathway in Red and White *Myrica rubra* Fruits

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摘要 以红果肉杨梅‘大叶梅’和白果肉杨梅‘水晶’为研究材料,运用2-DE和MALDI-TOF-TOF质谱技术,比较分析两个品种成熟期果肉花青苷和糖代谢途径相关蛋白的差异表达,共获得41个2倍差异表达蛋白,其中33个差异蛋白得到质谱鉴定。与白果肉的‘水晶’相比,有3个蛋白质在红果肉的‘大叶梅’中特异表达,29个蛋白质上调表达,1个下调表达。将这些差异蛋白按照功能进行分类,大部分涉及花青苷代谢(12%)、糖和能量代谢(30%)、蛋白质代谢(18%)、防御应答(15%)等生理过程。发现花青素合酶(ANS)、苯基丙氨酸解氨酶(PAL)、查尔酮合酶11(CHS11)、二磷酸尿核苷葡萄糖:类黄酮3-O-葡萄糖基转移酶(UFGT)是花青苷合成密切相关的关键酶,这些酶在红果肉的‘大叶梅’中明显上调表达;同时,还发现9个糖代谢相关蛋白在红果肉的‘大叶梅’中也显著上调表达。花青苷和糖代谢途径关键蛋白对杨梅果肉花青苷合成和颜色的形成起到重要作用。

关键词: [杨梅](#) [花青苷](#) [糖代谢](#) [差异蛋白](#)

Abstract: The investigation of differentially expressed proteins of red cultivar ‘Dayemei’ and white cultivar ‘Shuijing’ of *Myrica rubra* in ripening time were conducted by using 2-DE coupled with MALDI-TOF-TOF/MS approaches. The comparison of the protein patterns of ‘Dayemei’ and ‘Shuijing’ showed 41 differential expressed protein spots in these two cultivars, of which 33 were identified, among them, 29 proteins up-regulated, 3 proteins specifically expressed and 1 down-regulated in ‘Dayemei’. The identified proteins were classified according to their functions which involved in anthocyanin metabolism (12%), carbohydrate and energy metabolism (30%), protein metabolism (18%) and defense response (15%). We found that the enzymes of anthocyanidin synthase (ANS), phenylalanine ammonia lyase (PAL), chalcone synthase 11 (CHS11) and UDP-glucose : flavonoid 3-O-glucosyltransferase (UFGT) involved in anthocyanin synthesis were successfully identified. These enzymes were up-regulated obviously in ‘Dayemei’. Meanwhile, 9 proteins involved carbohydrate metabolism were also up regulated. Up-regulated the key proteins involved in anthocyanin and carbohydrate metabolism were important for anthocyanin accumulation and color formation in *Myrica rubra*.

Keywords: [Myrica rubra](#), [anthocyanins](#), [carbohydrate metabolism](#), [differentially expressed proteins](#)

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