



## SEED $\alpha$ -D-GALACTOSIDES OF SELECTED VICIA SPECIES AND ENZYMES INVOLVED IN THEIR BIOSYNTHESIS

LESŁAW B. LAHUTA<sup>1\*</sup>, JOANNA GOSZCZYŃSKA<sup>1</sup>, AND MARCIN HORBOWICZ<sup>2</sup>

<sup>1</sup>Department of Plant Physiology and Biotechnology, University of Warmia and Mazury, ul. Oczapowskiego 1A, 10-718 Olsztyn, Poland

<sup>2</sup>Marcin Horbowicz, Department of Plant Physiology and Genetics, University of Podlasie, ul. Prusa 12, 08-110 Siedlce, Poland

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We compared the soluble carbohydrate composition of seeds of ten wild and cultivated species of the genus *Vicia*. In some *Vicia* species (*V. angustifolia*, *V. grandiflora*, *V. sativa*, *V. septum*) they contained only raffinose family oligosaccharides (RFOs) and in others also D-pinitol and its  $\alpha$ -D-galactosides. In terms of galactosyl pinitol composition they were divided into three groups: those accumulating small amounts of mono-, di-, tri-galactosyl pinitol A (GPA, ciceritol and TGPA, respectively) and unknown compound (*V. sylvatica* and *V. hirsuta*); those accumulating more ciceritol than TGPA (*V. tetrasperma* and *V. villosa*); and those accumulating more TGPA than ciceritol (*V. cracca* and *V. tenuifolia*). The differences in the activity of galactosyltransferases engaged in RFOs and galactosyl pinitol synthesis confirmed this classification. Seeds of *V. angustifolia*, naturally accumulating only RFOs, showed an ability to accumulate exogenously applied D-pinitol or D-*chiro*-inositol and to form the respective  $\alpha$ -D-galactosyl cyclitols. Levels of synthesized galactosides depended on the type and concentration of cyclitol in the feeding solution, and seed maturation stage. However, even a high level of D-pinitol or D-*chiro*-inositol in the feeding solution caused accumulation of only small amounts of mono- and di-galactosyl pinitols, or tri-galactosyl D-*chiro*-inositol in seeds of *V. angustifolia*. Enhanced synthesis of galactosyl cyclitols, mainly mono- and di-galactosides of D-*chiro*-inositol (fagopyritols), clearly reduced production of verbascose. We suggest that exogenously applied free cyclitols inhibit biosynthesis of tri- and di-galactosides and/or cause substrate competition in enzymes of *Vicia* species.

**Key Words:** D-*chiro*-inositol, D-pinitol, raffinose family of oligosaccharides, galactosyl pinitols, enzymes, *Vicia*, seed.

e-mail: lahuta@uwm.edu.pl