

Structural features of N-glycans linked to glycoproteins from oil palm pollen, an allergenic pollen

ABSTRACT

The pollen of oil palm (*Elaeis guineensis* Jacq.) is a strong allergen and causes severe pollinosis in Malaysia and Singapore. In the previous study (Biosci. Biotechnol. Biochem., 64, 820-827 (2002)), from the oil palm pollens, we purified an antigenic glycoprotein (Ela g Bd 31 K), which is recognized by IgE from palm pollinosis patients. In this report, we describe the structural analysis of sugar chains linked to palm pollen glycoproteins to confirm the ubiquitous occurrence of antigenic N-glycans in the allergenic pollen. N-Glycans liberated from the pollen glycoprotein mixture by hydrazinolysis were labeled with 2-aminopyridine followed by purification with a combination of size-fractionation HPLC and reversed-phase HPLC. The structures of the PA-sugar chains were analyzed by a combination of two-dimensional sugar chain mapping, electrospray ionization mass spectrometry (ESI-MS), and tandem MS analysis, as well as exoglycosidase digestions. The antigenic N-glycan bearing 1-3 fucose and/or 1-2 xylose residues accounts for 36.9% of total N-glycans: GlcNAc2Man3Xyl1Fuc1GlcNAc2 (24.6%), GlcNAc2Man3Xyl1GlcNAc2 (4.4%), Man3Xyl1Fuc1-GlcNAc2 (1.1%), GlcNAc1Man3Xyl1Fuc1GlcNAc2 (5.6%), and GlcNAc1Man3Xyl1GlcNAc2 (1.2%). The remaining 63.1% of the total N-glycans belong to the high-mannose type structure: Man9GlcNAc2 (5.8%), Man8GlcNAc2 (32.1%), Man7GlcNAc2 (19.9%), Man6GlcNAc2 (5.3%).

Keyword: Plant glycoprotein; Antigenic N-glycan; Pollen allergy; Oil palm pollen; *Elaeis guineensis* Jacq