

学 位 論 文 要 旨	
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題 目	<p style="text-align: center;">Studies on new lectins from <i>Marasmius oreades</i> and <i>Treculia africana</i> - the primary structures and sugar-binding specificities - シバフタケとアフリカパンノキの新規レクチンに関する研究 --一次構造と糖結合特異性--</p>
<p>Lectins are proteins of non-immune origin, which react polysaccharides and glycoconjugates through sugar-specific binding sites. Therefore, lectins have been used in agricultural and biomedical areas. As lectins are capable of recognizing many kinds of glycans, and related to complex biological phenomenon, now still their applications are increasing. Most lectins being used are of plant origin and not so many of other origins. In applications of lectins, new sugar-binding specificities not found so far or higher sugar-binding specificities are eagerly anticipated. Recent study of lectin DNA revealed distribution of several lectin families taxonomically, but characterization of a lectin protein and analysis of sugar-binding specificity are indispensable to the application of a lectin.</p> <p>Until now, mushroom lectins have been classified into 6 families. From lawn mushroom USA (<i>Marasmius oreades</i>), a lectin MOA belonging to ricin family was purified and characterized. For preparing antiserum against MOA, it was found to be highly toxic for rabbit. But in Europe, wild lawn mushroom is known to be an edible mushroom. In this study, MOA was not detected in fruitbodies of Japanese <i>M. oreades</i>, and a new lectin MOL was found instead. MOL was purified from fruitbodies of <i>M. oreades</i> by asialofetuin column, and its complete sequence was determined by analyses of peptides and cDNA. The sequence shows mannose binding motifs of GNA-like lectin of plants. Its homology to GNAmaize and liverwort GNA-like lectin was 38%. Analyses of sugar binding specificity by hemagglutination inhibition and glycan-array revealed the preference of MOL toward complex-type <i>N</i>-glycans rather than high-mannose <i>N</i>-glycans, differing typical mannose binding lectins.</p> <p>African breadfruit is an edible plant of a member of Moraceae. From this seed, a mannose-recognizing lectin had been reported previously, but the detail was not elucidated. In this study, two Jacalin-related lectins (JRL, mannose-recognizing TAA-M and galactose-recognizing TAA-G) were purified by two affinity chromatographies of mannose-agarose and melibiose-agarose. The two lectins were positive toward antiserum against other mannose-recognizing lectin, suggesting that both were JRLs. The primary structure of TAA-G was determined by peptide sequencing. The sequence shows the two residues insertion around the supposed sugar-binding site, in comparison with sequences of other gJRLs. Analyses of the sugar-binding specificity by hemagglutination inhibition and glycan-array revealed that TAA-G recognize core 3 <i>O</i>-glycan (GlcNAcβ1-3GalNAcα-), which is known to be related to cancer malignancy, but did not T-antigen (Galβ1-3GalNAcα-), differing from other gJRLs.</p> <p>Thus, this study shows that MOL is the first GNA-like lectin characterized from Basidiomycota, and TAA-G is a useful lectin with the higher selectivity toward core 3 <i>O</i>-glycan.</p>	