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Isolation of antimutagenic factor(s) in the edible mushroom Agrocybe cylindracea

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Keywords: mushroom, antimutagenicity, heat-labile factor

Many investigations have demonstrated that antigenotoxic substances are contained in our daily foods including many mushrooms, the identification of which could lead to the development of cancer-preventing agents. Recently, we demonstrated antigenotoxic activity in the dried powder of Agrocybe cylindracea using the Drosophila genotoxicity-detection system. In this study, we attempted to isolate and identify the active component(s) contained in A. cylindracea. Dried powder of A. cylindracea was stirred in distilled water for 30 min at 4 °C. The filtrate was lyophilized, dissolved in distilled water, dialyzed with distilled water and lyophilized again. This water-extract showed antimutagenic activity against MeIQx- and IQ-induced mutagenicity in the Ames test. This antimutagenic activity disappeared when the extract was heated at 100 °C. The water-extract was subjected to gel filtration column chromatography using Sephadex G-100. Antimutagenic activity eluted in fractions corresponding to proteins about 30kDa and blue dextran in size. These results suggest that novel antigenotoxic factor(s) in A. cylindracea are water-soluble, heat-labile and large molecular weight compounds such as proteins and peptides. Further purification and characterization is in progress.

食用キノコヤナギマツケ（Agrocybe cylindracea）からの抗変異原物質の単離
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Study on rat in vivo comet assay treated with CPA, DMBA or MMS.

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The single cell gel electrophoresis assay (comet assay) is a simple and effective method for measuring DNA damage in cells with or without division capability. Recently, we evaluated Cyclophosphamide (CPA), 7,12-Dimethylbenz[a]anthracene (DMBA) and Methyl methanesulfonate (MMS) induced DNA damage using an in vivo comet assay of rat liver and peripheral white blood cells (WBC). Male adult rats were treated with CPA 10 or 100 mg/kg, DMBA 10 or 40 mg/kg, MMS 20 or 80 mg/kg or vehicle. Three hours after treatment, target organs were collected. Each target organ’s nuclei were isolated in an alkali solution using electrophoresis. The nuclei were etidium bromide stained, and the migration lengths of DNA fragments (comet tail lengths) were analyzed by fluorescence microscope and an image analysis computer program.

The mean comet tail lengths of the CPA or MMS treatment groups were longer than their control groups, and high dose group of the MMS was more than twice as long as its control groups. Although the mean comet tail lengths of DMBA treatment groups did not have dosage dependency, these comet tail lengths were longer than their control groups.

These results suggest that comet assay is able to detect DNA damages of rat liver and WBC treated with CPA, DMBA or MMS.

CPA、DMBA及びMMSを用いたラットin vivoコメットアッセイの検討
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