# <u>LIST OF FIGURES</u>

## **Chapter I:**

Figure 1:  $\alpha$ -amylose, the linear polymer of  $\alpha$ -D-glucose.

**Figure 2**: Cellulose,  $\beta$ -(1 $\rightarrow$ 4) linked glucose polymer.

Figure 3: Chitosan

**Figure 4**: Pectin:  $\alpha$ -(1 $\rightarrow$ 4)-linked galacturonic acid or its ester in the backbone.

Figure 5: Heparin, sulfated  $(1\rightarrow 4)$ -linked hexosamine and uronic acid.

Figure 6: Hyaluronic acid.

Figure 7: Photograph of the fruit bodies of an edible mushroom, *Termitomyces clypeatus*.

**Figure 8**: Photograph of the fruit bodies of an ectomycorrhizal edible mushroom, *Tuber rufum* (Pico) var.

Figure 9: Photograph of the fruit bodies of wild edible mushroom Lentinus sajor-caju

#### **Chapter III:**

**Figure 1(a)**: Gel permeation chromatogram of crude polysaccharide isolated from an edible mushroom *T. clypeatus* using Sepharose 6B column.

Figure 1(b): Determination of molecular weight of PS by gel permeation chromatography in Sepharose 6B column.

**Figure 2**: <sup>1</sup>H NMR spectrum (500 MHz,  $D_2O$ , 30 <sup>0</sup>C) of the PS isolated from the edible mushroom *T. clypeatus*.

**Figure 3**: (a) <sup>13</sup>C NMR spectrum (125 MHz, D<sub>2</sub>O, 30  $^{\circ}$ C) (b) with insert of the part of DEPT-135 spectrum (D<sub>2</sub>O, 30  $^{\circ}$ C) of the PS isolated from the edible mushroom *T. clypeatus*.

**Figure 4(a)**: HSQC spectrum ( $D_2O$ , 30  $^{0}C$ ) of anomeric part of the PS isolated from the edible mushroom *T. clypeatus*.

**Figure 4(b)**: HSQC spectrum ( $D_2O$ , 30  $^{0}C$ ) of other than anomeric part of the PS isolated from the edible mushroom *T. clypeatus*.

**Figure 5**: Part of NOESY spectrum of the PS of the edible mushroom *T. clypeatus*. The NOESY mixing time was 300 ms.

**Figure 6**: <sup>13</sup>C NMR spectrum (125 MHz, D<sub>2</sub>O, 30  $^{0}$ C) of the Smith-degraded glycerol containing tetrasaccharide isolated from the edible mushroom *T. clypeatus*.

Figure 7(a): Ferrous ion chelating ability of the PS isolated from the edible mushroom *T*. *clypeatus*. All the results are the mean  $\pm$  SD of three separate experiments, each in triplicate.

Figure 7(b): reducing power of the PS isolated from the edible mushroom *T. clypeatus*. All the results are the mean  $\pm$  SD of three separate experiments, each in triplicate.

Figure 7(c): superoxide radical scavenging activity of the PS isolated from the edible mushroom *T. clypeatus*. All the results are the mean  $\pm$  SD of three separate experiments, each in triplicate.

#### **Chapter IV:**

Figure 1(a): Gel permeation chromatogram of crude polysaccharide isolated from an edible mushroom *T. rufum* using Sepharose 6B column.

Figure 1(b): Determination of molecular weight of PS-II by gel permeation chromatography in Sepharose 6B column.

**Figure 2**: <sup>1</sup>H NMR spectrum (500 MHz, D<sub>2</sub>O, 30 °C) of PS-II, isolated from an edible mushroom *T. rufum*.

**Figure 3**: <sup>13</sup>C NMR spectrum (125 MHz, D<sub>2</sub>O, 30 °C); (inset: Part of DEPT-135 spectrum (D<sub>2</sub>O, 30 °C) of the PS-II, isolated from an edible mushroom *T. rufum*).

Figure 4(a): HSQC spectrum (D<sub>2</sub>O, 30 °C) of anomeric part of PS-II isolated from an edible mushroom *T. rufum*.

**Figure 4(b):** HSQC spectrum (D<sub>2</sub>O, 30 °C) of other than anomeric part (inset: C-6/H-6 correlation of  $\alpha$ -L-Fuc*p* moiety) of PS-II isolated from an edible mushroom *T. rufum*.

Figure 5: Part of ROESY spectrum of PS-II from an edible mushroom *T. rufum*. The ROESY mixing time was 300 ms.

Figure 6(a): The part of HMBC spectrum for anomeric protons of PS-II isolated from an edible mushroom *T. rufum*.

**Figure 6(b)**: the part of HMBC spectrum for anomeric carbons of PS-II isolated from an edible mushroom *T. rufum*. The delay time in the HMBC experiment was 80 ms.

**Figure 7**: <sup>13</sup>C NMR spectrum (125 MHz, D<sub>2</sub>O, 30 °C) of the Smith-degraded glycerol containing monosaccharide of PS-II isolated from an edible mushroom *T. rufum*.

Figure  $8(a_1)$ : Cytotoxicity of PS-II against human lymphocytes,  $8(a_{II})$ : IC<sub>50</sub> value of PS-II against human lymphocytes 8(b): Changes of Glutathione (Reduced and Oxidised) of PS-II against human lymphocytes, 8(c): Formation of membrane lipid peroxidation in terms of Maloneldehyde (MDA) of PS-II against human lymphocytes, 8(d): Generation of nitric oxide (NO) of PS-II against human lymphocytes, 8(e): Reactive Oxygen species (ROS) generation of PS-II against human lymphocytes.

### **Chapter V:**

**Figure 1**: Gel permeation chromatogram of crude polysaccharide isolated from an edible mushroom *L. sajor-caju* using Sepharose 6B column.

**Figure 2**: Determination of molecular weight of PS-I by gel permeation chromatography in Sepharose 6B column.

**Figure 3**: <sup>1</sup>H NMR spectrum (500 MHz, D<sub>2</sub>O, 30 °C) of PS-I, isolated from an edible mushroom *L. sajor-caju*.

**Figure 4(a)**: <sup>13</sup>C NMR spectrum (125 MHz, D<sub>2</sub>O, 30 °C) of the PS-I, isolated from an edible mushroom *L. sajor-caju*.

Figure 4(b): Part of <sup>13</sup>C NMR and DEPT-135 spectrum (D<sub>2</sub>O, 30 °C) of the PS-I.

**Figure 5(a)**: HSQC spectrum (D<sub>2</sub>O, 30 °C) of anomeric part of PS-I isolated from an edible mushroom *L. sajor-caju*.

**Figure 5(b)**: HSQC spectrum (D<sub>2</sub>O, 30 °C) of other than anomeric part (Inset: C-6/H-6 correlation of  $\alpha$ -L-Fuc*p* moiety) of PS-I isolated from an edible mushroom *L. sajor-caju*.

Figure 6: Part of ROESY spectrum of PS-I from an edible mushroom *L. sajor-caju*. The ROESY mixing time was 300 ms.

**Figure 7:** <sup>13</sup>C NMR spectrum (125 MHz, D<sub>2</sub>O, 30 °C) of the Smith-degraded glycerol containing trisaccharide of PS-I isolated from an edible mushroom *L. sajor-caju*.

Figure 8: Antioxidant activities of polysaccharides isolated from *T. clypeatus*, *T. striatus*, and PS-I (*L. sajor-caju*) (a) DPPH radical scavenging activity, (b) Hydroxyl radical scavenging activity, (c) Reducing power, (d) Chelating ability. Results are the mean  $\pm$  SD of five separate experiments, each in triplicate.