ANTIOXIDATIVE PROPERTIES OF THE EXTRACTS FROM DIFFERENT PARTS OF RADISH IN TAIWAN

姜淑繡、張基郁

E-mail: 9018627@mail.dyu.edu.tw

ABSTRACT

THE ROOTS, LEAFSTALKS, AND LEAVES OF RADISH (RAPHANUS SATIVUS L.) WERE USED AS MATERIALS IN THIS STUDY. AFTER FREEZE-DRYING, THESE THREE PARTS WERE EXTRACTED WITH METHANOL, WATER, AND ACETONE, RESPECTIVELY. THE ANTIOXIDANT PROPERTIES OF EXTRACTS, INCLUDING REDUCING POWER, FERROUS ION CHELATING POWER, A,A-DIPHENYL-B-PICRYLHYDRAZYL (DPPH) RADICAL SCAVENGING ACTIVITY, INHIBITORY EFFECT ON LIPID PEROXIDATION AND SUPEROXIDE ANION SCAVENGING ACTIVITY, WERE MEASURED AND COMPARED WITH THOSE OF ALPHA-TOCOPHEROL AND BUTYLATED HYDROXYANISOLE (BHA). DATA SHOWED THAT BOTH METHANOL AND WATER EXTRACTS HAD A HIGH REDUCING POWER IN ALL THREE PARTS, AND THE ACETONE EXTRACT HAD A LOWEST VALUE. THE METHANOLIC EXTRACTS FROM ROOT AND LEAFSTALK PARTS AND THE WATER EXTRACT FROM LEAF PART HAD THE HIGHEST REDUCING POWER, WHICH WAS 1.3~1.4 TIMES AS HIGH AS THOSE OF ALPHA-TOCOPHEROL AND BHA WHEN THE RATIO OF SAMPLE WEIGHT/SOLVENT VOLUME WAS AT 20 MG/ML. IN THE RESULTS OF FERROUS ION CHELATING POWER, THE METHANOL, WATER AND ACETONE EXTRACTS HAD A LOW FERROUS ION CHELATING POWER IN ALL THREE PARTS, HOWEVER, THE METHANOLIC EXTRACT STILL HAD THE HIGHEST CHELATING POWER AMONG THE EXTRACTS USING THESE THREE SOLVENTS, WHICH WAS 3 TIMES AS HIGH AS THOSE OF THE ACETONE EXTRACT AND WATER EXTRACT. ALPHA-TOCOPHEROL AND BHA HAD NO FERROUS ION CHELATING POWER. THE EXTRACTS FROM LEAFSTALK USING THESE THREE SOLVENTS ALL HAD A CHELATING POWER LOWER THAN 15%. THE METHANOLIC EXTRACT FROM LEAVE PART HAD AN INCREASING FOLLOWED BY DECREASING CHELATING POWER. IN THE RESULTS OF DPPH RADICAL SCAVENGING ACTIVITY, THE METHANOLIC EXTRACT FROM ALL THREE PARTS HAD THE HIGHEST VALUES, WHICH WERE 96.5, 96.8 AND 104.97%, RESPECTIVELY FOR ROOT, LEAFSTALK, AND LEAF PARTS WHEN THE RATIO OF SAMPLE WEIGHT/SOLVENT VOLUME WAS 20 MG/ML, AND WERE AS HIGH AS THOSE OF ALPHA-TOCOPHEROL AND BHA. THE WATER EXTRACT FROM LEAVE ALSO HAD A HIGH DPPH RADICAL SCAVENGING ACTIVITY. IN THE RESULTS OF INHIBITORY EFFECT ON LIPID PEROXIDATION, THE METHANOLIC EXTRACT FROM LEAF HAD THE HIGHEST INHIBITORY EFFECT, HOWEVER, WHICH WAS ONLY 0.6 TIMES AS HIGH AS THOSE OF ALPHA-TOCOPHEROL AND BHA. THE METHANOLIC EXTRACTS FROM ROOT AND LEAFSTALK HAD LOW INHIBITORY EFFECT, WHICH WAS 0.2 TIMES AS HIGH AS THOSE OF ALPHA-TOCOPHEROL AND BHA. IN THE RESULTS OF SUPEROXIDE ANION SCAVENGING ACTIVITY, THE METHANOLIC EXTRACTS FROM ROOT AND LEAFSTALK HAD HIGHER SCAVENGING ACTIVITY, BUT LEAF PART SHOWED NO SCAVENGING ACTIVITY. IN THE ANALYSIS OF COMPONENTS OF THE METHANOLIC EXTRACT FROM THESE THREE PARTS OF RADISH, DATA SHOWED THE POLYPHENOLS CONTENT OF LEAF WAS 12.05 MG/G, WHICH WAS 3~4 TIMES AS HIGH AS THOSE OF ROOT AND LEAFSTALK. THE FLAVONOIDS CONTENT OF LEAVE WAS 11.07 MG/G, WHICH WAS 10 TIMES AS HIGH AS THOSE OF ROOT AND LEAFSTALK. THE ASCORBIC ACID CONTENT WAS RANGED BETWEEN 1.06 AND 1.2 MG/G FOR ALL THREE PARTS. THE CAROTENOIDS CONTENT OF LEAF WAS APPARENTLY HIGHER THAN THOSE OF ROOT AND LEAFSTALK. FROM THE RESULTS, IT SHOWED THAT THE LEAF PART OF RADISH HAD HIGHER CONTENTS OF POLYPHENOLS, FLAVONOIDS AND CAROTENOIDS, AND HAD HIGHER VALUES OF REDUCING POWER, FERROUS ION CHELATING POWER, DPPH RADICAL SCAVENGING ACTIVITY, AND INHIBITORY EFFECT ON LIPID PEROXIDATION. THEREFORE, IT IS WORTHY TO GIVE A PROPER TREATMENT OR PROCESSING TO DEVELOP A NEW TYPE OF PRODUCTS FROM RADISH LEAVES TO ENHANCE THE UTILIZATION OF RADISH.

Keywords : WORDS: RADISH, ANTIOXIDANT PROPERTIES, REDUCING POWER, FERROUS ION CHELATING POWER, DPPH RADICAL SCAVENGING ACTIVITY, SUPEROXIDE ANION.

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