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

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ABSTRACT

THE FLOWERS, STEMS, AND LEAVES OF BROCCOLI （BRASSICA OLERACEA L VAR ITALICA PLENCK ）CULTIVATED IN TAIWAN WERE FREEZE-DRIED AND EXTRACTED WITH METHANOL, WATER, OR ACETONE. THE ANTIOXIDATIVE PROPERTIES, INCLUDING REDUCING POWER, FERROUS ION CHELATING ABILITY, AND A , A -DIPHENYL- B -PICRYLHYDRAZYL（DPPH）RADICAL SCAVENGING ACTIVITY, ANTI-PEROXIDATION ACTIVITIES, AND SUPEROXIDE ANION SCAVENGING ACTIVITY WERE TESTED IN THIS STUDY. THE ABOVE ANTIOXIDATIVE PROPERTIES OF BROCCOLI EXTRACTS ALONG WITH ALPHA-TOCOPHEROL AND BUTYLATED HYDROXYANISOLE (BHA) WERE COMPARED. RESULTS SHOWED THAT THE METHANOL AND WATER EXTRACTS EXHIBITED A HIGHER REDUCING POWER IN ALL THREE PARTS; WHILE THE ACETONE EXTRACT WAS THE LEAST. THE STEM EXTRACTS SHOWED THE HIGHEST REDUCING POWER, WHICH WAS 1.3 TIMES THOSE ALPHA-TOCOPHEROL AND BHA EXTRACTS, FOLLOWED BY THE LEAF EXTRACTS, WHICH EXHIBITED SIMILAR REDUCING POWER TO ALPHA-TOCOPHEROL AND BHA. THE LOWEST REDUCING POWER WAS OBSERVED ON FLOWER EXTRACTS, WHICH WAS ONLY THREE FOURTH OF THE REDUCING POWER AS COMPARED TO ALPHA-TOCOPHEROL AND BHA. THE METHANOL AND WATER EXTRACTS OF BROCCOLI ALSO EXHIBITED HIGH CHELATING ABILITY; WHILE THE ACETONE EXTRACTS SHOWED THE LOWEST. THE BROCCOLI STEM EXHIBITED THE HIGHEST CHELATING ABILITY AMONG THREE PARTS OF BROCCOLI. THE ACETONE EXTRACTS FROM STEM HARDLY SHOWED ANY CHELATING ABILITY AS COMPARED TO ALPHA-TOCOPHEROL AND BHA. THE METHANOL EXTRACTS OF FLOWER SHOWED THE HIGHEST DPPH RADICAL SCAVENGING ACTIVITY (＞90%) AMONG THREE PARTS OF BROCCOLI. ITS DPPH RADICAL SCAVENGING ACTIVITY WAS CLOSE TO BHA AND ALPHA-TOCOPHEROL. THE WATER EXTRACTS SHOWED ONLY 43% DPPH RADICAL SCAVENGING ACTIVITY; WHILE THE ACETONE EXTRACTS BARELY SHOWED ANY DPPH RADICAL SCAVENGING ACTIVITY. THE ANTI-PEROXIDATIVE ACTIVITIES OF THE METHANOLIC EXTRACTS OF BROCCOLI WAS IN AN ORDER OF BHA ALPHA-TOCOPHEROL＞FLOWER LEAF＞STEM. IN SUPEROXIDE ANION SCAVENGING ACTIVITY, THE METHANOLIC EXTRACTS FROM BROCCOLI STEMS SHOWED THE HIGHEST ACTIVITY, THE METHANOLIC EXTRACTS FROM FLOWER PARTS HAD THE SECOND, THE METHANOLIC EXTRACT FROM LEAF PARTS HAD THE LOWEST. IN THE ANALYSIS OF THE COMPONENTS WITH ANTIOXIDATIVE ACTIVITY, THE CONTENT OF ASCORBIC ACID IN THESE THREE PARTS WAS IN AN ORDER OF STEM＞FLOWER＞LEAF, THE CONTENT OF FLAVONOIDS WAS IN AN ORDER OF LEAF＞FLOWER＞STEM, THE CONTENT OF CAROTENOIDS WAS IN AN ORDER OF LEAF＞FLOWER＞STEM, AND THE CONTENT OF POLYPHENOL WAS IN AN ORDER OF LEAF ＞STEM＞FLOWER.

Keywords : BROCCOLI, ANTI-OXIDATIVE PROPERTIES, REDUCING POWER, FERROUS ION CHELATING ABILITY, DPPH RADICAL SCAVENGING ACTIVITY, ANTI-PEROXIDATION ACTIVITIES , SUPEROXIDE ANION SCAVENGING ACTIVITY.

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