2015 Wood Chemistry – 9th Week Antifungal Effects of Essential Oil (Ⅰ)

TA: Seon-Hong Kim

Antioxidant activity of woody essential oil

Oxidative stress is initiated by free radicals like hydroxyl, peroxyl and superoxide radicals, which become stable through electron pairing with biological macromolecules such as proteins, lipids and DNA in healthy human cell and can cause oxidative damages associated with many degenerative diseases such as atherosclerosis, coronary heart diseases, aging and cancer. Antioxidants are substances that prevent damage to cells caused by free radicals by supplying electron to these free radicals. But, synthetic antioxidants used nowadays have been caused or promoted negative health effects. So, Natural antioxidants have been studied. The major antioxidants of plant extracts are phenolic compounds such as phenolic acids, phenolic diterpenes, flavonoids, volatiles oils. Phenolic acids generally act as antioxidants by trapping free radicals and flavonoids can scavenge free radicals and chelate metals as well.

1. Materials

① Tree Essential Oil
Group 1: *Cryptomeria japonica*
Group 2: *Chamaecyparis obtusa*
Group 3: *Abies holophylla*
② Equipment: UV-visible spectrophotometry

2. Methods

① Estimation of total phenolics
1) An aliquot of the extracts/standard is mixed with 2 mL Folin-Ciocalteu reagent (previously diluted with water 1:10 v/v) + 2 mL (75 g/L) of sodium carbonate.
2) The tubes are vortexed for 15 seconds and allowed to stand for 20 minutes at 25°C for color development.
3) Absorbance is then measured at 760 nm UV-spectrophotometer (Shimadzu, USA).
4) Samples of extracts/standard are evaluated at a final concentration of 0.1 mg/mL.
5) Total phenolic contents are expressed in terms of gallic acid equivalent.

② DPPH radical scavenging activity
1) 0.5 mL samples of antioxidant solution in methanol are added to 0.5 mL of methanolic DPPH radical solution (0.15 mM).
2) The mixtures are volexed for 10 seconds and reacted for 30 minutes at room temperature.

3) The reactant mixtures are then immediately evaluated for optical density at 517 nm using the same spectrophotometer.
4) The activity is calculated according to equation [1].

Activity (%) = [1 – (As / Ac)] × 100 .....[1]

As: absorbance in the presence of the inhibitor

Ac: absorbance of the control reaction (= full reaction, containing no test compound)

§ Report

※ Describe data of 11th week, and should include results of other groups.

※ Research on typical natural antioxidant components.

※ Research on various experimental methods about antioxidant activity.

※ Report should be written by MS words (10 points, line spacing 1) or Hancom office (10 points, line spacing 120)

※ Report must be taken in the following order (in Korean or English): 1. Introduction, 2. Materials and Methods, 3. Results and Discussion, 4. Conclusions, 5. References.

※ Assignment should be appended to report. (If you copy and paste, you cannot get a grade)

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