

COMPARATIVE STUDY REPORT

RAVINTORENGAS 01/2000

THE ANTIOXIDATIVE CAPACITY OF RAVINTORENGAS PINE BARK EXTRACT

1. THE SCOPE OF THE STUDY

The antioxidative capacity of Finnish Pine Bark extract, French Maritime Pine Bark extract, and green tea was carried out. The reference compound for the antioxidative capacity in this study was ascorbic acid (vitamine C).

2. METHODS

The investigation was made by using Iron Chelate method with UV-Vis-spectrophotometer. The used test method indicates the inhibition of hydroxyl radical formation in the antioxidative material. The oxidative superoxide and peroxide radicals undergo typically hydroxyl radical formation in biological reactions. (ref. Halliwell et al. *Fd. Chem. Toxic.*, **33**, 1995, 601-617.

The study was performed in CRS-Biotech laboratoy (Medipolis-Center, Oulu, Finland) in July 2000. The test sample of Finnish Pine bark extract was received from Ravintorengas Oy, and the sample was freeze dried by CRS-Biotech prior the measurement. The reference materials were bought from local stores prior the measurement. Ascorbic acid (vitamine C) was Ph. Eur. quality (Tamro). The green tea portion was prepared as instructed by supplier (1 gr. / 100 ml of water). One pill (40 mg of French Maritime Pine Bark extract), 40 mg of Finnish Pine Bark extract, and 40 mg of vitamine C were dissolved in 40 ml of distilled water. All samples were diluted 1/100 in the distilled water prior the measurements.

The following samples were compared:

1. Finnish Pine Bark Extract (Ravintorengas)
2. French Maritime Pine Bark Extract
3. Chinese Green Tea

3. RESULTS

The UV-spectra of each sample was measured before and after the iron chloride/ iron sulphate addition. The relative changes of each spectra were registered. Thus the indication of chelation activity of each material was obtained, shown in the Table 1.

Table 1. FeCl₃-chelation test (wavelength range 200-300 nm, concentration 10 mg/l).

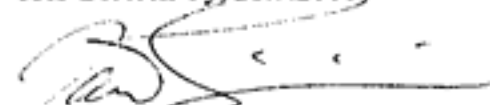
Sample	The relative change of UV-max. (%)
Havupuu Pine Bark Extract (Ravintorengas)	405
French Maritime Pine Bark Extract	260
Chinese Green Tea	38.4
Vitamine C	70.0

4. CONCLUSIONS

According the measurements, the 40 mg portion of Finnish Pine Bark Extract seems to be 1.5-times stronger hydroxyl radical inhibitor as 1 pill (40 mg) of French Maritime Pine Bark Extract, over 10 times stronger as Chinese Green Tea , and ca. 5 times stronger as recommended daily dose (60 mg) of Vitamine C.

Antioxidativity is defined as materials ability to reduce oxidation reactions in metabolism, and there are many different methods and measures to investigate this phenomenon. In this study we used only one indicative method *in vitro*. Because of these encouraging test results, it would be very interesting to carry out full clinical study *in vivo*, to confirm the results of this study.

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Jari Siivari, Ph.D. (Chem)
Managing Director