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Biological Active Compounds from Plants of Subarctic Origin

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Abstract

Several plants are reported to be produced various biological active compounds. Lichens from the extreme environments such as high altitude, high UV, drought and cold are believed to be synthesized unique types of secondary metabolites than the other one. Several human pathogenic bacteria and fungi have been muted into drug resistant strains. Various synthetic antioxidant compounds have posed carcinogenic effects. This phenomenon needs further research for new effective drugs of natural origin. This manuscript aimed to screen new source of biological active compounds from plants of subarctic origin.

Keywords: biological active compounds; subarctic origin; medicinal plant

Background

Reactive oxygen species (ROS) and reactive nitrogen species (NOS) are accumulated in living organisms during normal metabolic processes and exogenous stimuli such as UV-radiation, stress. ROS, such as superoxide anions (O2–), hydroxyl radicals (OH), hydrogen peroxide (H2O2), and hypocholorous acid (HOCl), and NOS such as nitric oxide radical (NO) have been associated with inflammation, cardiovascular diseases, cancer, aging-related disorders, metabolic disorders, and atherosclerosis [1]. ROS are dangerous because they can attack unsaturated fatty acids and cause membrane lipid peroxidation, decreases in membrane fluidity, loss of enzyme receptor activities, and damage to membrane proteins, ultimately leading to cell inactivation and cell death [2]. Living organisms possess a natural defense mechanism that counters the deleterious effects of ROS. Despite the existence of such a mechanism, increasing ROS accumulation over the lifetime of a cell can cause irreversible oxidative damage [3]. Thus, antioxidant agents that can slow or prevent the oxidation process by removing free radical intermediates are desired. Several strong synthetic antioxidants have already been reported [4], however most of them have been proven to be highly carcinogenic [5]. For this reason it has become very necessary to derive antioxidants from natural sources for use as supplements to human health. A wide range of natural compounds, including phenolic compounds, nitrogen compounds, and caretenoids [6] have antioxidant properties.

Results and Discussion

Antioxidant activity

All the tested plant extracts and the commercial standard (BHA) exhibited DPPH free radical scavenging activities in the concentration dependent manner that could be easily read by a spectrophotometer obtaining a decreased absorbance at 517 nm. BHA is a strong commercial antioxidant compound and the IC_{50} (50% inhibition) of this compound was 4.98 µg/mL in the present experiment. In case of lichen, 3 species, *Thamnolia vermicularis*, *Peltigera didactyla,* and *Peltigera malacea* showed strong antioxidant activity (IC_{50}, 5.2- 6.1 µg/mL), one species of lichen *Peltigera aphthosa* showed moderate and 15 species showed weak antioxidant activity. Similarly, 4 species of mosses showed moderate and remaining 11 species showed weak antioxidant activity.

Antimicrobial activity

The differences in antimicrobial activities may be due to variation in antimicrobial metabolites among tested samples. AM activity of test samples is species specific. Such results clearly suggest that subarctic plants species are potential source of species specific antimicrobial active compounds.

Conclusion

The observed experimental data clearly showed that most of the tested plants showed potent antioxidant activities *in vitro*. In addition, many higher plants and lichens species showed potent antimicrobial activity against human pathogenic bacteria, *Staphylococcus aureus*, *Escherichia coli* and fungi, *Candida albicans*. In addition, most of the antimicrobial and antioxidant active plants species were not toxic against *Artemia* larvae which could be an indication of being nontoxic plant species. In addition, the observed data also clearly showed that several antioxidant and antimicrobial compounds could be obtained from these plants resources. Therefore, further works of isolation and characterization of antioxidant and antimicrobial compounds merit from these plants resources.

References

1. Ames BN, Shigenaga MK, Hagen TM: Oxidants, antioxidants and the degenerative diseases of aging. *Proc Natl Acad Sci USA* 1993, 90: 7915-7922. 10.1073/pnas.90.17.7915
2. Dean RT, Davies MJ: Reactive species and their accumulation on radical damaged proteins. *Trends Biochem Sci* 1993, 18: 437-441. 10.1016/0968-0004(93)90145-D
3. Tseng TH, Kao ES, Chu CY, Chou FP, Lin Wu HW, Wang CJ: Protective effects of dried flower extracts of *hibiscus sabdariffa* L. Against oxidative stress in rat primary hepatocytes. *Food Chem Toxicol* 1997, 35: 1159-1164. 10.1016/S0278-6915(97)85468-3
4. Shimizu K, Kondo R, Sakai K, Takeda N, Nagahata T, Oniki T: Novel vitamin E derivative with 4-substituted resorcinol moiety has both antioxidant and tyrosinase inhibitory properties. *Lipids* 2001, 36: 1321-1326. 10.1007/s11745-001-0847-9
5. Grice HC: Safety evaluation of butylated hydroxyanisol from the prospective of effect on forest-omach and oesophageal squamous epithelium. *Food Chem Toxicol* 1988, 26: 717-723. 10.1016/0278-6915(88)90072-5
6. Mei RQ, Wang YH, Du GH, Liu GM, Zhang L, Cheng YX: Antioxidant lignans from the fruits of *broussonetia papyrifera* . *J Nat Prod* 2009, 72: 621-625. 10.1021/np800488p