contrast to the standard mixture (containing 1 mM $CuCl_2$ instead Ag NPs), the NP-containing mixture was ineffective in the producing characteristic four-peak spectrum of hydroxyl radical DMPO adducts. However, Ag NPs caused the appearance of an ascorbyl radical-specific signal which showed the classical two-peak shape spectrum. Ascorbyl radicals are the products of ascorbate oxidation, relatively long-living and having distinct characteristic spectrum. An addition of natural plant radical scavenger mannitol (1 mM) or key antioxidant glutathione (1 mM) resulted in the disappearance of the ascorbyl radical signal, suggesting that these substances are capable of protecting ascorbate from Ag-NP mediated oxidation. Interestingly, Ag NPs did not induce generation of mannitol or glutathione radicals. Thiourea, caused an effect, which was similar to that of glutathione while bulk or supernatant did not induce ascorbyl radical signal. Application of Ag NPs (3000 and 15000 mg L^{-1}) to intact roots (sterile seedlings of *Arabidopsis thaliana* L. plants) resulted in characteristic ascorbyl radical peaks, which was sensitive to a number of free radical scavengers. High concentrations of H_2O_2, which are known to cause the oxidation of L-ascorbic acid, also induced the formation of the ascorbyl radicals (used as a positive control). Addition of bulk particles or supernatant did not result in the formation of ascorbyl radicals in intact roots. Overall, these results showed that Ag NPs can promote redox imbalance and oxidative stress through affecting cell ascorbate pool but not via production of hydroxyl radicals.

REACTION OF CHOOSEN COMPOUNDS FOUNDED IN EEP WITH FREE RADICALS

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Antioxidant activity of ethanolic extract of Polish propolis (EEP) depends on its chemical composition. Our previous study allowed to identify main phenolic compounds, flavonoids and their derivatives in our EEP. In this study we tested selected compounds (the highest concentration in sample of EEP): caffeic acid, *p*-coumaric acid, ferulic acid and chrisin using three below methods:

1. DPPH radical scavenging activity.

To 0.04 ml test sample was added 0.120 ml methanol. Then the sample was mixed with 0.04 ml DPPH in methanol about (A_{524nm} = 0.900 ± 0.020).

After 15 min the optical density of the sample was measured at 524 nm. Next, we set the curves for Trolox and studied compounds.

2. ABTS radical scavenging activity.

ABTS was dissolved in distilled water to a 7 mM concentration. ABTS radical cation (ABTS•+) was produced by reacting ABTS stock solution with 2.45 mM potassium persulfate (final concentration) and allowing the mixture to stand in the dark at room temperature for 16 h before use. Then a solution of 0.180 ml of dilute ABTS • + (A_{734nm} = 0.700 ± 0.020) was added 0.2 ml test sample. Then the sample was incubated 15 min. The optical density of the sample was measured at 734 nm. Next, we set the curves for Trolox and studied compounds.

3. Ferric reducing-antioxidant power (FRAP) assay.

To 0.180 ml of the working compound (0.3 M acetate buffer pH 3.6, 10 mM 2,4,6-Tris (2-pyridyl) -*s*-triazine TPTZ 40 mmol/l HCl; 20 mM $FeCl_3$, in ratio of 10:1:1) was added 0.02 ml test sample. After 15 min the optical density of the samples were measured at 593 nm and set the curves.

The obtained results indicate different activities tested compounds. The problem is more complicated if there are many mixed compounds.

SALINITY INDUCES PRODUCTION OF SUPEROXIDE ANION RADICALS IN *PHYSCOMITRELLA PATENS*

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The moss *Physcomitrella patens* is a model plant, which is widely used to investigate physiological reactions of plant cells at the molecular level and to produce pharmacologically active compounds. This moss has a dominant haploid phase allowing direct forward genetic analysis and manipulations with bioengineering tools. *Physcomitrella patens* can be easily cultured and maintained in the non-differentiated juvenile growth form (protonema form), which is convenient for study of developmental programmes, role of mutations and DNA damage response. Adult growth form (gametophores) contains leaf- and stem-like structures, and rhizoids (root-like organs) without vascular tissues. Leaves, rhizoids, and protonemal filaments consist of one layer of cells that facilitates microscopic observations of stress-induced and developmental modifications. Apart from annotated genome, the genomic resources for this plant include ESTs and full-length cDNA collections and microarrays. Growing in wet environment, this moss is normally not exposed to high salinity or