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*

Zvanarou S.A., Przhevalskaya D.A., Demidchik V.V.

Department of Plant Cell Biology and Bioengineering, Biological Faculty, Belarusian State University, Minsk, Belarus

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 drought. Nevertheless, global warming leading to increased drought periods and soil salinisation can also affect mosses. At the moment, very few data can be found on how salt stress affects nonvascular plants, such as mosses and ferns. The aim of this study was to explore changes in growth and primary salt stress responses in *Physcomitrella patens.* In higher plants, NaCl (>40 mM) induces complex osmotic and ionic perturbations leading to oxidative stress. The mechanism of the salt-induced radical imbalance is related to the damage of electron transport chains and biosynthesis of oxygen-derived radicals *de novo* by HADPH oxidases, class III peroxidases and apoplastic oxidases. Here, superoxide anion radical production in response to NaCl was tested using fluorescent probe dihydroethidium, which is believed to be specific to superoxide, and fluorescent microscopy (Nikon Eclipse TS100F). Growth measurements showed that *Physcomitrella patens* protonema extension and gametophore expansion are significantly inhibited by NaCl starting from 100 mM. Stop of growth was found at 400 mM NaCl. This indicative of relatively high salt tolerance of *Physcomitrella patens*. Fluorescent microscopy measurements using dihydroethidium demonstrated that superoxide is produced after treatment of moss with NaCl concentrations over 200 mM. Surprisingly, 100 mM did not cause superoxide generation. The pharmacological analysis of this effect demonstrated that it is sensitive to thiourea, reduced gluthathione, polyamines, gadolinium ions and superoxide dismutase. Here, the model of molecular and cellular mechanisms of NaCl induced superoxide generation is proposed. Overall, this study showed that high [NaCl] is capable of inducing initial reaction of the oxidative stress (superoxide production) in the moss *Physcomitrella patens* which correlates with inhibition of growth in the same species.

БИОРАЗНООБРАЗИЕ ЛЕСНЫХ ЭКОСИСТЕМ ЦЕНТРАЛЬНО-КАЗАХСКОГО МЕЛКОСОПОЧНИКА – ПЕРСПЕКТИВНЫЕ ИСТОЧНИКИ ПРИРОДНЫХ АНТИОКСИДАНТОВ

Айдарханова Г.С., Кожина Ж.М.

Евразийский национальный университет им. Л.Н.Гумилева, Астана, Казахстан

Территория Центрально-Казахского мелкосопочника (ЦКМ) включает целый ряд глобально значимых экосистем. Лесные экосистемы островками, ленточной полосой расположены во всех природных зонах Казахстана. Северные пустыни, реликтовые еловые леса и уникальные горные экосистемы, расположенные на территории ЦКМ вошли в Глобальный Перечень Всемирного Фонда дикой природы. Международные, ре-