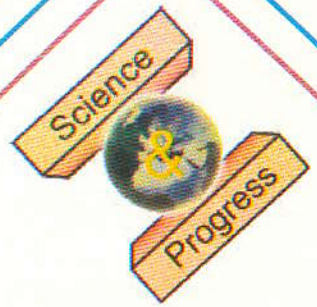


# CONFERENCE ABSTRACTS

**International Student Conference**

**"Science and Progress"**

DAAD

Санкт-Петербургский государственный университет

Freie Universität Berlin

German-Russian Interdisciplinary Science Center

**St. Petersburg – Peterhof**
**November, 10-14**
**2014**

**CONFERENCE ABSTRACTS**
International Student Conference "Science and Progress" — SPb.: SOLO, 2014 – 176 pp.

ISBN 978-5-98340-336-9

**ISBN 978-5-98340-336-9**

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## Influence of industrial pollutions on a chemical composition and morphology of some medicinal plants

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One of plants features is the ability to accumulate different substances from the environment, including toxic. Moreover, under adverse conditions of the environment the content of phenolic compounds can increase in plants. Phenolic compounds play a role of protective barrier on a way of mechanical, chemical, thermal factors of the environment, and also pathogenic influences. So, actual task is the studying of chemical composition changes of medicinal plants as a consequence the influence of anthropogenic factors. It's important to estimate the quality of medicinal raw materials from one hand and the degree of environmental pollution from the other hand. The aim of the research is the evaluation of the industrial pollution impact on the chemical composition and morphology of yarrow (*Achilléa millefólium*), plantain (*Plantágo májor*), dandelion (*Taráxacum officinále*) using methods of FTIR and UV spectroscopy, AAS and SEM. Different kinds of the medicinal herbs for the study are collected from the same industrial areas of the town Tver (Thermal Power Stations, Railcar plant, The Paint Factory, The Printing Plant) with different environmental stress. Finished pharmaceutical forms of yarrow and plantain of the firm "Health" have been chosen as a control sample.

The results showed that the chemical composition of the analyzed medicinal plants susceptible to the influence of anthropogenic factor. In the IR spectra of samples collected from different sites there are differences for the following characteristic absorption bands (intensity and position of the maximum): ~1740–1734 $cm^{-1}$ ($\nu_{C=O}$), ~1656–1620 $cm^{-1}$ ($\nu_{C=C}$), ~1541–1516 $cm^{-1}$ (Amide II), ~1107–1024 $cm^{-1}$ ($\nu_{C-O}$, $\nu_{C-C}$, $\nu_{C-O-C}$). Besides, there are differences in UV absorption spectra of the alcoholic extracts in the region of 200–500 nm, which indicate the change of the composition and concentration of phenolic compounds in the samples depending on the sites of gathering. It is found out that content of some heavy metals (Fe, Zn, Mn, Cu, Cr, Pb, Co, Cd) detected in the samples by means of AAS is changed in a wide range in dependence on the kind of the herbs and on the site of collection. Morphological changes of the leaves have been studied by the help of the SEM and showed big difference in the structure. Thus, it has been proved by various techniques (FTIR, UV spectroscopy, AAS and SEM) that the chemical composition and the leaves structure of the medicinal herbs depend on the environment condition that should be considered in preparation of the finished pharmaceutical forms.



# B. Geo- and Astrophysics