Everyone who walked in the autumn forest, or in the city park during leaf fall, clearly felt the characteristic smell inherent in this time of year. Particularly expressive, and rather pleasant, the air smells in those places in which the ground is covered with a thick layer of freshly fallen poplar leaves. Volatile Organic Compounds (VOCs) released from dead foliage are responsible for this smell. In the case of poplar leaves litter, these are mainly terpenes, each of which has its own aroma. Due to these properties, terpenes are part of any perfume.

However, our interest in leaf litter, or, more specifically, in the VOCs they isolated, is related to their *possible participation in important processes in the air* we breathe. It was found that in air polluted with nitrogen oxides, which are emitted by automobiles and industrial enterprises, these VOCs are *capable of producing secondary pollutants*, the most famous (and most dangerous!) of which is ozone (O_3). The excess content of ozone in the surface air has a very harmful effect on all living organisms and on rubber and on textiles made from both natural and synthetic fibers. Worldwide, ozone pollution-related annual losses of agricultural products are now estimated at many billions of dollars. Moreover, ozone is a very strong greenhouse component that can greatly affect the climate of our planet. Meanwhile, over the past 80 years, a continuous increase in the O_3 content in surface air has been observed.

Finding out the role of biogenic VOCs in increasing O_3 concentration requires the construction of very complex mathematical models, the effectiveness of which critically depends on the accuracy of taking into account all kinds of participants in atmospheric photochemical processes, such as Ox and VOCs. The simulation results are currently unsatisfactory because they are characterized by a high degree of uncertainty. Many experts believe that this is due to the incomplete accounting of biogenic VOCs (in modern models, only those that are secreted by living arboreal vegetation are taken into account) and that there is still an unaccounted source for these compounds.

We believe that such an unaccounted source of VOCs highly active in atmospheric processes is wood litter and living plants of the lower tiers of forests (mosses, lichens and small shrubs), as well as the so-called grass felt of the Eurasian steppes, American prairies and pampas, and African savannahs. This thought is probably supported by Finnish and Swedish scientists, who in recent years have been conducting intensive research on VOC emissions from the bottom of forests. However, due to the peculiarities of the species composition of the forests of the Scandinavian countries, these studies relate exclusively to coniferous (mainly pine) forests. Our studies are devoted to the decayed leave litter of the main forest-forming deciduous tree species of the sub-boreal and mid-latitudinal zones (birch, aspen, oak, beech, maple, elm, hornbeam), as well as to living plants of the bottom of these forests. The research plan provides for the study of the composition and rate of VOC emissions by decaying in the natural conditions litter for three years. These studies will be carried out together with Russian scientists from Perm' University, which will take into account the impact on the processes under study of various climatic factors. Moreover, experiments on the decomposition of steppe grass felt will be carried out in the Kungur steppe in the Perm Territory, since in Poland there are no true steppe biomes.

It can be assumed that the decomposition rate of dead plant residues and the composition of the released VOCs depend on many factors, both biotic and unrelated to the activities of living organisms (microorganisms-destructors). Therefore, the focus will be not only on the role of microscopic fungi and bacteria in the decomposition of litter, but also the effect of changes in the environment on these processes. The ultimate goal of the project is to estimate VOC emissions by the studied sources in the boreal and mid-latitude zones, suitable for inclusion in the mathematical models of the photochemical formation of secondary atmospheric pollutants.