

DESCRIPTION FOR THE GENERAL PUBLIC

Cardiovascular diseases are the most common cause of deaths in Poland. It is believed that an oxidative stress is at the bottom of these diseases, which is termed as the shift in the balance between oxidants and antioxidants in favor of oxidants. Reactive oxygen and nitrogen species cause changes in the structure and function of many molecules involved in haemostasis. Proteins and lipids of endothelial cells, platelets and plasma are mostly oxidized. It has been observed that there is a strict correlation between the consumption of antioxidant rich products and maintaining an oxidative- antioxidant balance.

Dandelion (*Taraxacum officinale*) is an example of plants rich in antioxidants. This is a perennial plant belonging to the *Asteraceae* family. It is widely distributed throughout the world, particularly in the warm temperate climate zone. It mainly grows on meadows, lawns, roadside roads, gardens, orchards and wasteland. This plant is easy to simplify and requires no special soil and climatic conditions. For many centuries the plant was used by our ancestors in the treatment of gastrointestinal ailments, cancer, liver inflammatory diseases, eye diseases, osteoarthritis, eczema and anemia. Also, nowadays, the interest of dandelion is growing due to its high nutritional and therapeutic value. Both flowers, leaves and roots are used in traditional medicine in China, Mexico, Turkey and India. The studies show that extracts from various organs of this plant possess an antioxidant, antibacterial, anti-inflammatory, anti-tumor, diuretic and hypolipidemic activity. Our preliminary *in vitro* studies indicate that a phenolic fractions from dandelion may also affect for a complex hemostatic system. In addition, dandelion products have found use in various areas of life such as a food, cosmetic or chemical industries. In many countries, dandelion is consumed in a variety of forms. For instance, a young dandelion greens can be eaten on salad, which is popular in France. While in the United States there is a high demand for coffee from roasted dandelion roots, which is a diet substitute for people with diabetes. A wide range of biological activities of dandelion raw materials is determined by a varied chemical composition within this can be distinguished two main groups of chemical compounds such as phenolic and terpenes. In addition, the presence of vitamins and minerals increases the nutritional value of the plant. However, the chemical composition in various tested dandelion extracts by many authors was not always well described and the substances responsible of biological activity were not identified, too.

The aim of the proposed project is to identify the chemical composition of dandelion raw materials such as leaves, petals, roots and fruits, using chromatographic methods. The obtained fractions from dandelion organs will be tested *in vitro* for biological activity with particular attention to the hemostasis system. In addition, the potential antioxidant activity of dandelion fractions will be examined.

The proposed project is interdisciplinary because it combines phytochemical analyses with methodically advanced research on biological activity. The obtained results may help to better understand mechanisms of bioactivity of preparations obtained from dandelion, and to fill current gaps in phytochemical characterization of this plant. Antioxidant, anticoagulant and anti-aggregation preparations of plant origin may be a new substitute for drugs used in the prevention and treatment of many diseases, including cardiovascular diseases, and to be an environmentally free of zoonotic infections risk in the future. The easy availability of raw material in particular encouraged to conduct research and exploring a new possibilities for the use of dandelion in medicine, especially in an era of intensified search for new, natural pharmaceuticals. The obtained results may also contribute to the broader use of dandelion as a source of nutraceuticals.