ENVIRONMENT BETWEEN POLLUTION AND THERAPY

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Abstract
Environment is a critical complex index for quality of the habitat for humans, animals and plants. Ecosystems are communities of different species of plants and animals which lives together, depending one of another, being influenced by the pollution of air, water or soil. Some plants and animals are used as natural bioindicators of environmental quality, thus in pollution situations the specific organisms cannot live in the ecosystem. Then, environment was since ancient the source of the natural therapeutics products. But in case of pollution the plants used in curing do not have the same effect, or even cannot be used as therapy due to the pollutant contains. So, the environmental quality is very important not only for the ecosystems, but also for some applications of plants in natural products therapy.

Introduction
Environmental bioindicators could be represented by biological, physical or chemical indicators which can give information about the quality of the ecosystem. Biological bioindicators are plants, animals, microorganisms; physical and physic-chemical indicators are represented by the pH, the temperature, electrical conductivity, color, smell, texture and others; and chemical indicators are organic carbon content, total nitrogen, phosphorus, potassium, cation exchange capacity, oxygen compounds, dissolved oxygen, and other chemicals [Bending et al., 2004; Ahmad et al., 2006; Bianchi et al., 2013; Hannah et al., 2016; Turner and Montagna, 2016; Fusaro et al., 2018].

Bioindicators and environment quality
Bioindicators are living organisms which can screen the quality of an ecosystem, in terms of nutritional and pollution characteristics. Thus, for example, some plants can be nutrients for animals and some animal products can become nutritional facts for plants. But when pollutants concentrate too much, the plants nutrients are affected both in quantity and quality, and also further the animals are affected due to the quality and quantity of nutritional plants.
Experimental researches demonstrated that there are some specific organic entities, like plankton, which respond very quickly to the environmental changes, and due to this very important characteristic these organisms became bioindicator of water quality and pollution. This phenomenon is explained by the fact that some pollutants modify several water characteristics such as light transmission, temperature, chemical composition and pH, dissolved oxygen. The most important advantages are that these bioindicators could be used as early pollution diagnosis, can be used for evaluate the degree of contamination, being in the same time a very good economical option for environmental pollution evaluation [Khatri and Tyagi, 2015; Parmar et al., 2016].

Soil contaminants and bioindicators

Usually the bioindicator term is used for a group of biotic and abiotic reactions to environmental changes. Thus, different varieties of moss are used as natural monitoring bioindicators to heavy metals pollution. *Hylocomium splendes* was often used as heavy metal pollution indicator in tundra environment from northwest of Alaska. Very close to that geographical area is a mine from where are extracted large quantities of zinc, and this metal became in time an important contaminant of the soil, muss being affected very easily at any increase of zinc concentration. Not only this muss variety is used as bioindicator of metal contamination, but also different specific lichens [Parmar et al., 2016].

Heavy metals are the most common contaminants of the soil, along with the agriculture chemicals used in excess, which unfortunately cannot be broke down in metabolic pathways. Thereby, when metal concentration exceeds the optimal and tolerability range, the plant nutrition, development, and health is negatively affected. This can be explained due to metal property to inhibit the enzyme activity in the cellular structure, and oxidative stress is manifested. On the other hand, heavy metals replace some mineral essential nutrients from soil, affecting the plant normal biochemical pathways [Chibuike and Obiora, 2014].

Rice plant is reduced in height growth if the soil is contaminated with 1mgHg/kg [Kibra, 2008].

Experimental researches demonstrate that an association of plants and microbes reduced faster the heavy metal content of some polluted mercury soil [Weyens et al., 2009].

Air contaminants and bioindicators

Ozone is a chemical form of oxygen which is an aggressive stress factor for forest health. Due to its importance in the quality of air given by the forest quality and health, United States Department of Agriculture made some specific protocols of sampling and estimation of ozone pollution (U.S. Forest Service Forest Inventory and Analysis Program – FIA) and its impact on forest health [Smith et al., 2007].

Specific vascular plant species like tabacco (*Nicotiana tabacum* L.) are very sensitive to environmental ozone. Thus, when the concentration of ozone is increased the tabacco plant exhibits different foliar injuries symptoms. Also black cherry (*Prunos serotina*) is used as ozone uptake bioindicator in North America [Manning, 1998].

Other research reports presented a very good option to use lichens as bioindicators of air quality. Lichens inflorescence and specific anatomical parts of lichens are susceptible to ecosystem pollutants, and by monitoring and characterization of lichen species behavior to different contaminants the quality of air can be appreciated [Stolte et al., 1993].

The main characteristic of plants regarding pollution and contaminants is that these organisms "cannot run out of pollution", like animals can do. Plants have to find biochemical mechanisms to filter the contaminants and intake the nutrients from the environment. Water content of soil and air, soil and air chemistry, temperature, pH, dissolved oxygen are only some of the characteristics very important for plants health. Plants can be used as environment alarms that react relatively quickly to any increase of the concentration of some components in the environment. Because the leaves are the plant "lungs", first signs of pollution are the foliar symptoms and leaves composition, leaf being the anatomical part of the plants that concentrate especially the metals [Nouchi, 2002].

Water contaminants and bioindicators

Also some animals and microorganisms metabolism is influenced by the composition of nutrients and the contaminants of ecosystem. Oxidative stress is a biochemical state which can be unbalanced due to various factors, including contaminants. Thus, the oxidative stress is evaluated by the quantification of some specific enzymes (catalase, glutathione S-transferase,

glutathione peroxidase, reduced glutathione) and compounds (lipid peroxidation products) which very easily deviate from the normal range, with repercussions on the cellular activity and viability. This property was tested on *Anguilla Anguilla* L. (European eel) as a contamination response on the natural freshwater lake in Portugal. So, the concentration of oxidative stress enzymes increased in the case of heavy metals, agricultural chemicals and domestic polluted waters discharged into the lake, and the distribution of the pollution chemicals in different organs were also indicators of the degree of contamination [Ahmadi et al., 2006].

Therapy with plants and environment

Plants are used from ancient to different therapeutic treatments, for prevention and cure various diseases. The only drugs from old time were the herbs, and for all medical problems they knew which plant and which anatomical part to use to solve the medical problem. Tictures, extractions (aqueous extractions; glyceric, hydro-glyceric, alcoholic, hydro-alcoholic extraction), infusions, teas, are the most used form of therapy. Oils, tinctures and gemmotherapeutic products are used for prevention and healing, but if these plants are contaminated with metals or different chemicals, the natural effect as drugs is diminished.

In agriculture it is important to know the agricultural aspects (planting time, the growth, the hervest time). Plants were used to obtain some nanomaterials, which can be used to proving the economical and biochemical safe, due to the interactions between NPs in plant.Nanomaterials are considered as waste or by-product of washing process, from where is accummulated in air, soil, and water. Some nanoparticles are very efficient to decontamination of the soil and water due to large specific surface area, available active sites on the surface, good optical and electrical properties, high stability and absorption capacity [Rai et al., 2018].

Lately, some plants extract are used as natural biopesticides in agriculture with very good results. Thus, saponin-rich plant extracts from plants like *Quillaja saponaria* and *Chenopodium quinoa* were used as ingredient in biopesticide [Jiang et al., 2018].

Traditional and Arabic plants were used in complementary and alternative treatment of different forms of cancer. According to new reports of World Human Organization, even advanced countries in the world accepted complementary treatment of cancer using herbal treatments. The benefic action of herb cancer therapy is given by some phytochemicals from plants, these herbal treatments having the advantages to have antitumoral effect with low side effects. Etnopharmaceutical of Arabic and Islamic plants includ acacia, different mushrums, leak, onion, garlic, aloe, dill, celery, mustard, crown daisy, camphor, myrrh, saffron, chamomile, black seed, olive, Harmala Africa Rue, wheat, ginger, red-berry, grapes. Arabic and Islamic herbal medicine have log tradion, stimulates the immunologic system, and have antiviral, antibacterial, antiinflammatory, antioxidant, anticancer and antimutagenic effect [WHO, 2013-2014; Azaizeh and Arab, 2008].

Conclusion

Plants are part of ecosystem, being in relation with the other living organisms, and with the quality of the environment. Plants can be used as bioindicators of environmental pollution, and also can be used for decontamination of soil, water or even air.

Polluted environment is often the nutritional environment of different plants. As the plants cannot move from a side of another like animals, they became contaminated because of the polluted environment.

Due to the possibility of using plants therapy in cancer and many other diseases treatment, the environment of the plants used in herbal organic therapy has to be free of contaminant and to assure the optimal nutrients for development.

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