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RESISTANCE OF PLANTS TO ATMOSPHERIC AIR POLLUTION

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Abstract: This article presents the resistance of plants to atmospheric air pollution and the physiological changes in plants when they are affected by gases in the air.

Key words: Atmospheric air, phytotoxicants, natural pollution, merocrine secretion, apocrine secretion, halocrine.

Substances harmful to the plant in atmospheric air cause physiological changes. These changes are related to the composition of the chemical substance, its effectiveness, external environmental factors, and the physiological activity of the organism. Some polluting substances are additional food for the plant and are added to the metabolism. Some of them have a toxic effect even in very small concentrations, for example, ozone, mercury, fluorine.

Harmful effect first disrupts photosynthesis, then respiratory processes, then biosynthesis of secondary substances, reduces transpiration and growth development.

Photosynthesis in the plant: 1) increases the sensitivity of the plant during flowering and fruiting.

2) a low concentration of toxic gases in the air causes invisible damage to the plant.

3) changes resulting from necrosis in the leaf reduce the photosynthesis occurring in it.

4) photosynthesis in healthy areas is activated in less than 20% damage of leaves.

5) when the concentration of toxic gases in the air is high, the photosynthesis process stops immediately or after a few minutes.

6) excessive accumulation of heavy metals in the leaves from the air and soil, as well as trapping of dust on the surface of the leaf sharply reduces CO2 uptake by the plant.

Many changes occur especially in chlorophylls under the influence of phytotoxicants. The respiration rate of leaves of different ages due to the influence of harmful gases is also different: the respiration rate increased by 58% in old leaves, by 66% in middle-aged leaves, and by 8% in young, new leaves.

Phytotoxicants are different in different species belonging to the same family: in one, respiratory processes are accelerated, while in the other, they slow down certain metabolic reactions.

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Each phytotoxicant affects changes in the oxidation of organic acids, carbohydrates, and respiratory processes.

Under the influence of toxic gases, the leaf is dehydrated to a certain extent, and it is reduced by 10-25% compared to that in the pure atmosphere.

Atmospheric air pollution affects the processes of photosynthesis, respiration, metabolism, and the exchange of carbohydrates from them, and it depends on the chemical composition, abundance, and concentration of phytotoxicants.

Oxides of fluorine, chlorine, sulphide anhydride and nitrogen produced during production of products in industry affect the metabolism of orthophosphate in plants. As a result, it slows down the formation of organic phosphorus substances and carbohydrates, proteins and fats.

Atmospheric air pollution occurs naturally due to the eruption of volcanoes under the influence of wind, the spread of plant pollen, and artificial anthropogenic influence.

A tree with 10 kg of leaves on a dry basis captures sulfur gas compounds from May to September of the growing season as follows:

Elm (Ulmus) - alder, gujum, poplar, elm - 120g, poplar (Populus) - white poplar, poplar, black poplar, mirzaterak, tall poplar - 180 g, linden (Tilia) - round linden, broad-leaved linden - 100g, white birch (Betula) - red birch - 90 g, shumtol (Fraxinus) - shum, blackshumtol, saurmatkoz, chuchchuktol - accumulates 170 g of sulfur oxides.

The vegetation around the air polluting enterprise collects twice as much sulfur compounds as those 3 km away from it.

Plants growing in different climatic soil conditions accumulate air toxicants in different amounts, despite the same composition and concentration. Phytotoxicants accumulate up to 20% in leaves, 90% of them are washed away after rain. If it rains after a few days, the leaching is reduced to 20-30%.

The amount of ammonia-absorbing bacteria and fungi decreases in the atmosphere of plants that emit sulfur dioxide, ammonia, formalin, cyclohexane and other gases into the atmosphere. Air pollution-resistant wheat (Elytrygia L.), bromus (Bromus L.), ermine (Artemisia L.), grass plants such as datura (Datura L.) are well tolerated in such areas.

In conclusion, harmful substances in the air are different depending on the type of plant, the age of the region, and the degree of damage. It has been proven that harmful substances in the air accumulate in certain parts of the plant body, and they even pass into the soil.

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