THE ECOSYSTEM OF INSECTS

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ABSTRACT

Insects are important in nature, and animals live in different relationships in the ecosystem. Insects live in different relationships with animals. In any changing conditions, insects are flexible and adapt with their external structure and physiology.

Key words: Insect, commensalism, adaptation, mutualism, synoky, climate, cuticle, abdomen, entomology, variability, gene, genetics, sclerite, pleuritis, tergite.

The concept of an ecosystem corresponds to a relatively closed, relatively harmonious organization of natural bodies, united by participation in the biogenic cycle of substances, energy and individuals, by common transformations and fate. In this sense, we are talking about the ecosystem of a meadow and a lake, an ocean and a forest, a decaying tree and a swamp. In addition, the term "ecosystem" is concretized as a synonym for biogeocenosis - an elementary subdivision of the biosphere, within which the boundaries of other ecosystems and communities, climatic or soil zones, geochemical provinces do not pass, that is, its own boundaries are determined in accordance with the principle of the greatest functional integrity.[1,2]

The structure of the ecosystem is predetermined by a three-link cycle of environment-forming interactions of community members, starting with the synthesis of organic matter by producers (1), its subsequent use by consumers - consumers (2) and ending with the decomposition of this substance by decomposers (3) to the initial

products involved, in turn, in a new biogenic cycle. The main producers in terrestrial ecosystems are higher plants that transform the radiant energy of the Sun into the chemical energy of organic compounds, the usual consumers are insects and vertebrates, and the decomposers are soil-dwelling microorganisms and fungi.[1,2]

Calculations show that through photosynthesis, plants fix no more than 3% of the energy of sunlight; the rest of its quantity is used for climate formation. Converted into the energy of chemical bonds, it is used for metabolism and respiration, and some of it accumulates as phytomass. Phytophages that feed on plants, in turn, use the consumed organic matter for their own metabolism and growth. Their biomass, which is significantly less than that of plants, attracts predators and parasites - consumers of the second order, which, in turn, can become victims and owners of consumers of the third order, and so on. Naturally, when moving from a trophic level of a lower order to the next one, from producers to phytophages and further to predators and parasites, the energy flow dries up, so the trophic chain of an ecosystem includes no more than 4–6 links.

In the same direction, there is a consistent reduction in the number and biomass of all participants in the trophic chain, many of which, as multicellular creatures, are mortal. The associated regularity of rejection of the bodies of dead plants and animals into the ecosystem ensures the activity of decomposers and the development of another trophic chain - from corpses and excrement used by saprophages and decomposed in the end, to the original inorganic compounds in the soil. It is noteworthy that in terrestrial ecosystems, the energy flow along this chain is not inferior to another, originating from producers, and sometimes even surpasses it. In broad-leaved forests, annually shed leaves far exceed the phytomass consumed by phytophages. It is also noteworthy that with the development of the communities inhabiting the ecosystem, starting from the pioneer ones, represented by lichens and mosses, overgrown with bare rocks, with their own grasses and shrubs on fires and logging sites, the productivity of ecosystems increases. Subsequently, as their regimes stabilize, as they approach the state of mature, final (or climax) communities, production is balanced by decay.

Communities, or biocenoses, are the most active component of the ecosystem. Numerous and varied interactions of its own components—populations—are established and carried out within a community. We have already considered the most important interactions among individuals of populations of the same species; now let us turn to the analysis of the interactions of populations of different species - to the interspecies relations between them, since, listing them using examples of positive and negative interactions, we limited ourselves to definitions and brief comments on some of the possible ones, namely the following:

Direct interactions of populations of different species

For a deeper analysis, it is necessary to take into account not only the interactions between populations of different species, but also all the circumstances that accompany these interactions, as well as the environment in which their implementation is manifested.

Constructive, but not yet properly mastered, approaches of this kind were developed by Clark and Geiger (1964,1967) in the concept of the life system of a population. They defined it as a system consisting of a population and its effective environment, that is, only that part of the ecosystem that affects the population in question and causes appropriate reactions in it.

The concept of a life system is characterized by three principles: drawing attention not to factors, but to the processes that form the mechanisms of population dynamics (the principle of procedurality); identifying the relationship of these processes, the role of which is refracted in the life system in such a way that the population and its effective environment form a unity (the principle of consistency, integrity) and taking into account only those components of the ecosystem that are important for the population (the principle of population-centrism).[3,4]

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