The Flower as a Sensory and Intelligent Structure in the Reproduction of Angiosperms

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The flower is the generative organ of angiosperms, representing an evolutionarily transformed, adapted, and specialized structure.
Modern scientific studies have revealed the complexity of flowers at an entirely new level: beyond their role in spore formation, pollination, and fertilization, they also possess the ability to respond to various environmental stimuli—light, sound vibrations, temperature, and chemical signals.

The main focus of this work is on botanical bioacoustics, a field that explores plant responses to sound. For example, the flowers of *S*napdragon and *O*enothera biennis (evening primrose) respond to the buzzing of bees, causing a 20–30% increase in nectar sugar content within just a few minutes. Trichomes located on the surface of the flower function as mechanoreceptors; upon detecting buzzing, they trigger the expression of genes involved in sugar metabolism. This suggests that the flower is not a passive structure—it acts as a living, regulated sensory hub.

In addition, this paper discusses the morphological structure of flowers, floral symmetry, diversity of inflorescences, the unique phenomenon of double fertilization in angiosperms, seed and fruit development, and seed dispersal strategies.
It also highlights structural coloration—how nanostructures present on petals create ultraviolet optical effects to assist pollinators in navigating toward the reproductive parts of the flower.

This interdisciplinary topic connects botany, ecology, and biophysics, showcasing the flower as a prime example of biological integration at the organismal level. The presented material is based on the latest international research (National Geographic, Phys.org, ScienceBlog, BMC Plant Biology, Elementy.ru).

The aim of this presentation is to clearly and innovatively demonstrate the behavioral and sensory capabilities of plants to a broad audience, thereby contributing to the development of a modern perspective in biology.