

TEXT 3

Plants and animals physiology

Although you may place organisms without difficulty in either the plant or the animal kingdom, it is essential to know the basic differences between these two groups. That's why we can distinguish physiology of plants and animals.

Plant physiology. It is a subdiscipline of botany concerned with the functioning, or physiology of plants. Closely related fields include plant morphology (structure of plants), plant ecology (interactions with the environment), photochemistry (biochemistry of plants), cell biology, and molecular biology. The scope of plant physiology as a discipline may be divided into several major areas of research. First, the study of photochemistry (plant chemistry) is included within the domain of plant physiology. To function and survive, plants produce a wide array of chemical compounds not found in other organisms. Photosynthesis requires a large array of pigments, enzymes, and other compounds to function. Secondly, plant physiology includes the study of biological and chemical processes of individual plant cells. Plant cells have a number of features that distinguish them from cells of animals, and which lead to major differences in the way that plant life behaves and responds differently from animal life. Thirdly, plant physiology deals with interactions between cells, tissues, and organs within a plant. Different cells and tissues are physically and chemically specialized to perform different functions. Fourthly, plant physiologists study the ways that plants control or regulate internal functions. Like animals, plants produce chemicals called hormones which are produced in one part of the plant to signal cells in another part of the plant to respond. Finally, plant physiology includes the study of how plants respond to conditions and variation in the environment, a field known as environmental physiology.

Animal physiology. It is the study of animal functions. Animal physiology is subdivided into the four main parts, such as general physiology, special physiology, comparative physiology and age physiology. General physiology deals with the analysis of such universal and important processes as blood circulation, metabolism, respiration etc. Special physiology applies general physiological principles in order to investigate characteristics of a particular animal species. Comparative physiology concentrates on similarities and differences of physiological functions of various living organisms. The problem of how physiological functions change with animal age is of special interest to age physiology. The main approach in animal physiology is to study the evolutionary origins of the physiological mechanisms in order to understand the significance of these mechanisms for modern animals. Modern physiology which is based on chemical, physical and anatomical methods investigates biological organization of the animal body at different levels, that is, cells, tissues, organs. One of the parts of special physiology is devoted to farm animal physiology. The aim of this science is not only to study physiological functions of the farm animal body, but to control them in order to increase the production of eggs, offspring, milk, meat and wool. Other major branches of scientific study that have grown out of physiology research include biochemistry, biophysics, biomechanics, pharmacology, cytology as well as genetics which are known as the biological bases for rational animal husbandry.