

Perspective

Anatomy of invertebrates and arthropods

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ABOUT THE STUDY

The field of biology known as anatomy is concerned with the study of the structure of organisms and their parts. Given that these are the processes via which anatomy is produced, whether over short- and long-term timescales, comparative anatomy, evolutionary biology, and phylogeny are intrinsically linked to anatomy. A common pairing of related disciplines is anatomy and physiology, which examine the structure and operation of organisms and their components, respectively. One of the fundamental basic disciplines used in medicine is human anatomy.

There are two categories in anatomy; macroscopic and microscopic. The study of an animal's body parts under the microscope, often known as gross anatomy, requires unaided vision. The division of superficial anatomy is also included in gross anatomy. In microscopic anatomy, optical tools are used to investigate cells as well as the tissues of different structures (a process known as histology). The development of knowledge about the roles played by the organs and structures of the human body has been a defining feature of anatomy history.

Anatomy of invertebrates

Invertebrates are a wide group of living things, ranging from the most basic unicellular eukaryotes, like Paramecium, to more sophisticated multicellular animals, like the octopus, lobster, and dragonfly. They make up over 99% of all animal species. None of these organisms, by definition, have a backbone. Although the basic structure of the cells of single-celled protozoans is the same as that of multicellular creatures, some regions of the cells have undergone specialisation to become the analogues of tissues and organs. Cilia and flagella are frequently used for locomotion, while pseudopodia may also be used to move forward. Phagocytosis may be used to obtain food, photosynthesis may be used to meet energy requirements, and the cell may be supported by an exoskeleton or endoskeleton. Multicellular colonies can develop in some protozoans.

A metazoan is a multicellular organism that uses several cell types to carry out a variety of tasks. Epithelium and connective tissue are the two most fundamental forms of metazoan tissues, and both are found in almost all invertebrates. The extracellular matrix that is secreted by the epithelial cells that make up the epidermis' outer layer supports the organism. Echinoderms, sponges, and some cephalopods have an endoskeleton developed from the mesoderm. Exoskeletons in arthropods are derived from the epidermis and are made of chitin. Silica makes up the exoskeleton of minuscule diatoms and radiolaria, while calcium carbonate makes up the shells of brachiopods, polychaete worms, and some molluscs. While the epidermis of other invertebrates may secrete a variety of surface coatings, such as the pinacoderm of sponges, the gelatinous cuticle of cnidarians (polyps, sea anemones, and jellyfish), and the collagenous cuticle of annelids, these invertebrates may lack solid structures. Several different cell types, including sensory, glandular, and stinging cells, may be present in the outer epithelial layer. Additionally, protrusions like microvilli, cilia, bristles, spines, and tubercles may be present.

Anatomy of arthropods

Arthropods are the largest division of the animal kingdom, with over one million species of recognized invertebrate. Insects have segmented bodies that are supported by a hard-jointed exoskeleton, which is primarily formed of chitin. A head, a thorax, and an abdomen are the three separate sections that make up the body segments. Pair of sensory antennae, two compound eyes, one to three simple eyes (ocelli), and three sets of modified appendages that make up the mouthparts are commonly seen on the head. Three pairs of segmented legs one pair for each of the three parts that make up the thorax as well as one or two pairs of wings make up the thorax. The digestive, respiratory, excretory, and reproductive systems are all housed within the eleven segments of the abdomen, some of which may be combined. The bodily parts of different species vary greatly from one another and have undergone several modifications,

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particularly the wings, legs, antennae, and mouthparts.

Spiders, a group of arachnids, have four pairs of legs and a body made up of an abdomen and a cephalothorax. Spiders don't have wings or antennae. Since most spiders are venomous, they have mouthpieces called chelicerae that are frequently attached

to venom glands. On their cephalothorax, they have a second set of appendages called pedipalps. These serve as taste and smell organs and are segmented similarly to the legs. Each male pedipalp has a cymbium, which resembles a spoon and serves to support the copulatory organ.