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An exploration on the structure of Crustaceans

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Abstract

The name crustacean, which derives from the Latin word crusta, which meaning shell, refers to all members of the phylum Arthropoda Crustacea. The group of invertebrate organisms known as crustaceans is incredibly varied and includes both sessile and active species like barnacles as well as active species like crabs, lobsters, shrimp, krill, copepods, and amphipods. The biggest phylum in the animal kingdom is called Arthropoda. In total environments, it has roughly 11,340,000 species. Approximately 83% of all animal species on Earth are represented by this. Arthropoda encompasses a wide variety of insects, such as spiders, scorpions, prawns, crabs, millipedes, and centipedes. Arthropoda are known for their linked appendages, chitinous exoskeleton, and heteronomous metamerism. Arthropodization is the process through which these features evolve. The overall body surface of extremely tiny crustaceans serves as the conduit for the exchange of breathing gases. While terrestrial animals breathe via the trachea and book lungs, large aquatic arthropods breathe through gills and book gills.

Keywords: crustacean, Arthropoda Crustacea, metamerism

Introduction

Cladocerans are defined as crustaceans if they have at least one head that is not protected by a carapace, 4-6 pairs of (thoracic) legs, no paired eyes, swim with their second pair of antennae, and lack any of these characteristics. Humans depend heavily on crustaceans from the ocean; crabs, lobsters, and shrimp are caught and eaten all over the globe.

The world's crustacean population totals more than 52,000 species, which include well-known marine creatures like lobsters, crabs, shrimp, crayfish, and barnacles. Greater crustaceans breathe via gills, whereas smaller ones breathe through their bodies. Individuals in the majority of crustaceans are dioecious, or either male or female. Between species, reproduction varies. The majority of them are the most significant marine creatures. More varied than any group of arthropods, crustaceans are second or third in abundance of all categories of animal life, after insects and vertebrates, and are an essential source of prey for marine life in the ocean food chain for a range of creatures, including whales, fish, and pinnipeds. They may be found in interior and

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oceanic waters from the Arctic to the Antarctic, as well as at altitudes ranging from far below sea level in the Himalayas to 16,000 feet. All crustaceans have a tough shell that shields them from predators and keeps their bodies from losing water. Crustaceans must moult as they become bigger because their exoskeletons do not expand to fit the size of the animal inside of them. It might take a few minutes to many hours for an animal to moult. A soft exoskeleton develops below the old one during moulting, and the old exoskeleton is discarded. Since the new exoskeleton is still fragile, the crab is susceptible during this period until it hardens. Crustaceans generally increase their body size by 40–80% practically immediately after moulting. The majority of crustaceans sexually reproduce with distinct male and female**.**

Habitat, physiological characteristics, and behavior of Crustaceans

There are several habitat types for crustaceans. Ephemeral pools are home to triops. Fairy shrimp and other more well-known branchiopods also accomplish this. Along with crayfish and other decapods, certain copepods and ostracods are also found in freshwater settings. There are crustaceans on land as well; pill bugs, an isopod species, are arguably the most well-known. (Not all organisms having the word "bug" in their name are insects. The majority of crustaceans are marine organisms that support the world's marine ecology. Crustaceans are the main herbivores that consume phytoplankton in a large portion of the open ocean. This population of crustacean grazers may provide as a food source for a wide range of predators, including other crustaceans, squid, fish, and whales: witness without the euphausid Euphausia superba, the pelagic Southern Ocean's predator food chain would break down. A major portion of the world's seas are home to krill, which are euphausids (order Euphausiacea) that school in vast numbers.

Copepod larvae and certain adults make up a significant portion of the marine fauna known as microzooplankton, which is a microscopic (less than a fifth of a millimetre) component of the food web. This minuscule type of plankton, which makes up a large fraction of the biomass in the open ocean, has just recently been thoroughly accounted for. Small copepods' function in this ecosystem is poorly understood, but new research has shown that they also consume bacteria and protozoa in addition to phytoplankton (see Turner 2004 for review). Overall, it is extremely difficult to

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quantify but impossible to overstate the role that tiny pelagic crustaceans play in connecting bigger marine creatures to the microscopic marine food chain.

Additionally significant constituents of benthic populations are crustaceans. Throughout the whole world's ocean, they prowl the bottom and dig burrows in the silt. Some benthic crustaceans are as minuscule and little researched as their pelagic relatives, while other, bigger, more recognisable taxa have been the subject of much research. Since it is simpler to study these benthic representatives, we may conclude that crustaceans use every possible survival tactic. Many have developed close ecological ties with an amazing variety of other organisms.

Origin and application of Crustacean

Crustaceans may be valued from the standpoint of bi-level functioning and also have significant economic, ecological, and aesthetic values. While certain bigger crustaceans, including shrimp, lobsters, and crabs, are important food sources, many food webs depend on smaller crustaceans, which are sometimes regarded as a class or superclass rather than a subphylum. Carcinology is the name given to the study of crabs in science. Malacostracology, crustaceology, and crustalogy are other names for carcinology, and a scientist who studies it is a carcinologist, crustaceologist, or crustalogist. The origin of a crustacean varies depending on its order, suborder, or other taxa. The Burgess Shale fauna and other Cambrian deposits include the first known crustaceans. These ancient crustaceans resemble worms in form, yet they do contain many of the distinctive characteristics of crustaceans that are still present in contemporary species like shrimp. Thus, the age of the genus and species serves as the basis for the origin. In the Paleozoic epoch, tiny planktonic and free-swimming crustaceans were widespread. Except in locations like the Burgess Shale where some cataclysmic events suffocated them soon enough to prevent their demise, it is exceedingly uncommon to locate their whole skeletons. Therefore, the burrows occur in direct relationship with erosional regressive surfaces and are strong stratigraphic markers of sudden paleoenvironmental change. The crustaceans inhabited mud firm grounds that were created by erosion during a fast sea-level fall.

Life Cycle of Crustacean

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There may be differences in the life cycles of various crustaceans or commonalities between the life cycles of various crustaceans. There are around 30,000 distinct species of arthropods of a marine nature that belong to the Crustacean class, which is the biggest group. There will be differences in the life cycles of various crustaceans, but there will also be commonalities between the life cycles of various crustaceans. The Nauplius stage is thought to be the stage that unites all crustaceans throughout the life cycle. Since neither the abdomen nor the thorax have yet formed, this is the earliest larval stage of crustaceans and solely consists of the head and telson of the animal.

Zoea larval stage: The life cycle of crustaceans includes a zoea larval stage. Naturalists thought the crustacean to be a completely different species when they gave it the name zoea.*Mysis or megalopa stage:* Depending on which group of crustaceans is involved, the stage of growth that comes after the zoea stage of growth is either the Mysis or megalopa stage. The crustacean is going to start to resemble its mature form more. The crab will rely more on grazing and foraging for food throughout this stage of development.The majority of crustaceans achieve the adult development stage by their first birthday. The majority of crab species may breed and produce offspring after a year.

Parasitism

In a relationship known as parasitism, one species of plant or animal benefits at the cost of the other, often without really harming the host organism. Either endoparasites, which may either be intercellular (inhabiting spaces in the host's body) or intracellular (inhabiting cells in the host's body), or ectoparasites, which live on the body surface of the host and do not usually cause illness in the host, include ticks, fleas, leeches, and lice. A third creature known as the carrier, or vector, is often used by intracellular parasites, such as bacteria or viruses, to spread to the host. An example of this relationship is malaria, which is brought on by a protozoan of the genus Plasmodium and is spread to people by the bite of an anopheline mosquito. The European elm bark beetle may spread the plant disease known as Dutch elm disease, which is brought on by the fungus Ceratocystis ulmi.

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All cowbird species and most cuckoo species engage in brood parasitism, a separate kind of parasitism. Instead of making their own nests, these birds lay their eggs in those of other species and leave them there in the hopes that the adult birds of those other species would raise the abandoned young as their own. The host or the host's brood aren't necessarily harmed by the cowbird's parasitism, but the cuckoo may remove one or more host eggs to allay any concerns about the existence of its own egg, and the juvenile cuckoo may heave the host's eggs and nestlings from the nest.

Conclusion

A group of creatures known as crustaceans (Arthropods) have an armoured exterior skeleton, or exoskeleton. The hard exoskeleton is the component that has been preserved as a fossil. The term "arthropod" is a combination of the Greek words "arthro" for joint and "poda" for foot or leg. The biggest phylum in the animal kingdom is called Arthropoda. In total environments, it has roughly 11,340,000 species. Arthropoda are known for their connected appendages, heteronomous metameric exoskeleton, and use of chitin. The overall body surface of extremely tiny crustaceans serves as the conduit for the exchange of breathing gases. While terrestrial animals breathe via the trachea and book lungs, large aquatic arthropods breathe through gills and book gills. The Cambrian sediments include the first known crustaceans. The majority of crustacean habitats are aquatic, and they may be found in freshwater or marine settings. However, certain species, such terrestrial crabs and terrestrial hermit crabs, have adapted to living on land. The nauplius stage followed by the zoea larval stage, post-larval stage, and adult development stage, mark the beginning of the various crustaceans' life cycles. An notable example of a crustacean is the ostracoda.

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