Introduction of spiders

Spiders are an important group of animals. They occur in all ecosystems with many species and individuals, contribute considerably to the biodiversity of a habitat and as a predator organisms they exert an important regulatory function. Spiders are therefore a very important indicator group for the quality of a habitat.

Spiders are predatory invertebrate animals that have two body segments, eight legs, no chewing mouth parts and no wings. They are classified in the order Araneae, one of several orders within the larger class of arachnids, a group which also contains scorpions, whip scorpions/ pseudoscorpions, phalangids (Daddy long legs), solifugids, mites and ticks. The study of spiders is known as Arachnology. Spiders, like many others invertebrates, have traditionally suffered a lack of attention from conservation professionals and the general public.

Importance of Spiders:

Spiders are abundant and ecologically important in almost every terrestrial and semi-terrestrial (wetland habitats on earth, from cold tundra and alpine ecosystems to tropical and rainforests and deserts. Some species live on the shores of the ocean and some dive into ponds and streams in search of prey-members of one Eurasian spider family (Argyronetidae) even live underwater in silken “diving bells” which they fill with air brought from the surface clinging to their hairy abdomens.

Spiders are usually so abundant and are among the most important predators in many ecosystems. Numbers often exceed 100 per square meter, which equates to 1 million spiders per hectare.

All spiders are predators and because the main item in most spider diets is insects, human benefit enormously from spiders. Spiders are important in controlling insect pests in most agricultural crops. By controlling insect population sizes, they keep most potential insect population too small to be economically damaging, most of the time. Spider also eats many insects that bother humans, such as mosquitoes and cock roaches. Since a single spider may eat many mosquitoes from in one day, over the course of its lifetime a spider may prevents hundreds of mosquitoes from surviving to produce even more mosquitoes from surviving to produce even more mosquitoes from surviving to produce even more mosquito offspring.

Additionally, spiders are an important food source for birds, lizards, wasps and other animals. Spider silk is important to bird species for nest building; 24 of 42 families of passerine birds and nearly all species of humming bird depend on silk from spiders and caterpillars for nest construction.

Many people fear spiders, but actually the majority of spiders are too small to bite humans. Any spider smaller than about 8 mm, or one quarter inch, in body length cannot break human skin

with their tiny fangs, and most spider species are smaller than this. Of those spiders large enough to bite humans, only a few have bites which are dangerous to humans. Only black widows (Latrodectus species) and brown recluse spiders (*Laxosceles recluse*) have potentially dangerous bits, and these are much more abundant in regions like dry deciduous forests.

Spiders help in making the soil fertile by its fecal matter. Spiders are rich in protein serve as food for wasps, reptiles and birds.

Spider silk have high tensile strength, Soft and can be used for making Bullet proof jackets, parashoot threads, violin strings and silk cloths The unmatched toughness of spider silk would allow improving several medical products such as wound closure systems, band-aids, and extremely thin sutures for neurosurgery specialty ropes and fishing nets, parachutes, ballistic applications (body armor), sporting goods, textiles, and lightweight constructions for airplanes. Therefore, one day industrially produced spider silk could out-compete man-made fibers. Spider venom is used for treating various medical conditions, such as Alzheimer's, lung cancer, and heart fibrillation.

Hummingbird nest made of spider silk because of its antibacterial property.

The venom of the Chile Rose tarantula (*Grammostola spatulata*) from South America contains an active protein, GsMtx-4, which blocks ion channels that are stretch activated. Black widow spider venom has found to contain a peptide, which could potentially be used to treat Alzheimer's disease.

Pesticide from Spider venom
Components in the neurotoxic venom of funnel-web spider have been found to be specific for insects such as cockroaches, crickets, fruit-flies and the *Helicoverpa armigera* moth which destroys cotton crops.

Morphology

The body of spiders divisible into two distinct parts, cephalothorax and abdomen joined together by a narrow pedicel. The cephalothorax and abdomen joined together by anarrow pedicel. The cepahlothorax is covered dorsally by a hard sclerotised shield, the carapace and ventrally by sternum. The anterior region of cephalothorax is called the cephalic region bearing the eyes and the posterior region is called the thorasic region which generally bears a depression in the middle called thoracic groove.

On the cephalic region are present generally eight and sometimes six simple eyes. They are of two types- black or diurnal eyes and white nocturnal eyes. When both these types of eyes are present in spider, the condition is called heterogeneous and when only one type of eyes is present condition is termed as homogeneous. Generally eyes are arranged in two rows, four eyes in each

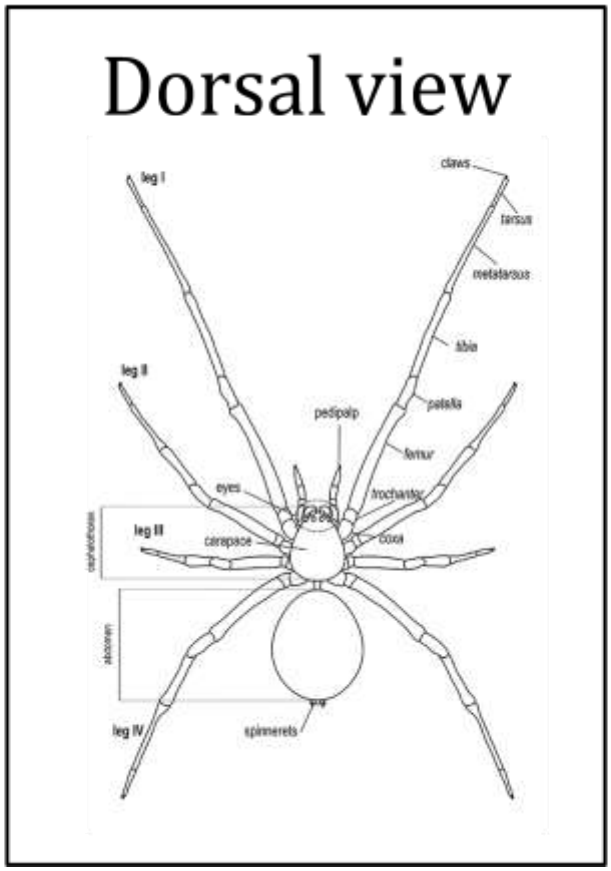
row. According to their position, the four pair of eyes are termed anterior medians, anterior laterals, posterior median and posterior laterals.

The area between the anterior row of eyes and the base of chelicerae is the clypeus. The chelicerare are the first pair of appendages of the cephalothorax, each chelicerae bearing a curved fang as its apex. The pedipalps are the second pair of appendages. Each pedipals composed of six segments: coxa, trochanter, femur, patella, tibia and tarsus,

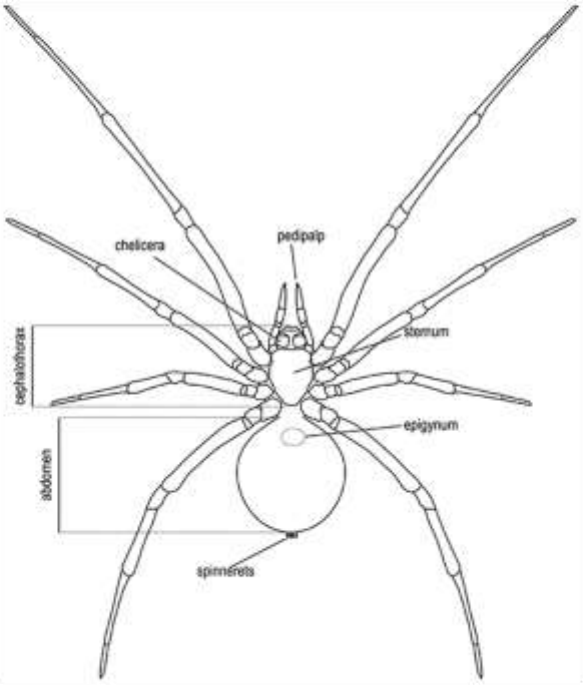
Legs are eight in number and are attached on the base of cephalothorax. Each leg is composed of seven segments: coxa, trochanter, femur, patella, tibia, metatarsus and tarsus.

The abdomen is produced posteriorly into a conical anal tubercle and bears three pairs of spinnerets ventrally; the first or the anterior pair, the second or the median pair and the third or the posterior pair. In number of families there is present in front of the spinnerets, a sieve plate, called the cribellum. A typical appendage called the coulus, lies between the bases of the anterior spinnerets.

Ventral surface of the abdomen is provided with slits for one or two pairs of book lungs, following by one or two paired spiracles. The female genital opening is the vulva or epigyne, with a transverse fold, known as epigastric furrow.



Ventral view



Lateral view