Brave Animals Without a Backbone



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Melanargia titea, the Levantine Marbled White, common in April and May. Flying slowly, females lay their eggs in flight.

The largest number of animal species on earth is not found in the groups most familiar to us, such as plants, birds, mammals, and reptiles; this honor goes to small microorganisms and to invertebrates, the animals that have no backbones. Although vertebrates such as mammals, amphibians, reptiles, fish, and birds are more visible and known to most of us, all these animals together make up less than 4 percent of the total number of animal species in the world. There may be as many as one trillion species of microorganisms (including bacteria and other single-cell organisms), and over 96 percent of all animal species on earth are invertebrates, which includes some two million described species and millions more that are yet to be described. Invertebrates come in all sorts of shapes, colors, sizes, and behaviors; they include insects, spiders, scorpions, and snails; and they are key parts of an integrated ecosystem on which human life also depends.

Palestine has a very rich invertebrate fauna. We have perhaps more than 25,000 species of insects, including over 130 species of butterflies, hundreds of species of moths, and thousands of species of beetles (many still undescribed). In a recent survey, the Palestine Museum of Natural History (PMNH) documented 54 species of butterflies in the West Bank that range from the most spectacular Swallow Tail to the small iridescent-blue species called Common Blue. This constitutes a great diversity in a small area of land (in comparison, Jordan has 97 species, whereas Palestine, with less than half the geographic size, has 130 species of butterflies). Butterflies are easily observed on daytime excursions, especially during the spring season. Most commonly encountered are the Small White (*Pieris rapae*), the Bath White (*Pontia daplidice*), and the Common Blue (*Polyommatusicarus*). At night, moths take over, and the best place to watch them is around lights. The Giant Peacock Moth (also called Giant Emperor Moth) *Saturnia pyri* can have wingspans of 10 to 15 cm; but there are also hundreds of tiny moths, including the one that infests our clothes (people use naphthalene or "moth balls" to drive them away). Each species of moth or butterfly is specific to a particular habitat, with its larva feeding on particular wild plants. The Cabbage White is of special concern as its larvae can damage crops. However, the PMNH recommends biological controls that are far better than the insecticides that destroy our ecosystem and harm human health!

Desertification, climate change, human activities, and the use of insecticides and herbicides are threatening biodiversity and also affect butterflies. There are many threatened species of butterflies, including the brilliant, all-yellow *Gonepteryx*. The Orange Tufted Butterfly *Anthocharis cardamines* was common in the Bethlehem area in the

Helix engaddensis is a common land snail in the Levant, found in Mediterranean, desert, and montane habitats. Dormant in the ground during dry season, it emerges in winter.

One peculiarity this black scorpion shares with other scorpions is that it fluoresces under ultraviolet light.

Blepharopsis mendica, the Devil's Flower Mantis, is common in Western Asia. It is a formidable predator that preys on moths, grasshoppers, flies, and other insects - at times females devour their mating partners.

1960s, according to observations made by Sana Atallah, as can be seen in his field notes and collected specimens. However, the PMNH was able to record it only in Al-Makhrour and in a protected area of the Bethlehem University campus that has been fenced in since the 1960s.

Another group of insects that is very common in Palestine is called *Orthoptera* (Latin for "straight wings"), commonly known as grasshoppers (*janadeb* in Arabic). With hind legs adapted for jumping and mouthparts designed especially for ingesting their specific plant diets, these animals are encountered in just about every habitat, from deserts to humid areas.

A king scorpion carrying its babies on its back.

Some have a hidden second pair of wings, with vivid colors that can range from crimson red to radiant blue. Around the areas that contain water, we have many species of dragonflies in Palestine (*ya'soub* in Arabic). They can hover like helicopters and dive like hawks on their insect prey. During the summer in Palestine, we can hear the noisy cicadas (*tazziz* in Arabic), some of which can remain dormant in the ground for years.

Spiders and scorpions belong to the group known as the *Arachnida*. There are nearly 2 dozen species of scorpions in Palestine, some as small as 5 mm long and others reaching 12 cm in length. The most poisonous is the yellow Deathstalker of the genus *Leiurus* that is mostly found in arid and semi-arid rocky habitats. In parts of the Jordan Valley, such as the region around Bardala in the northern Jordan Valley, the PMNH has encountered a very high density of this species in rocky areas, with about 1 to 2 individuals per square meter. When someone is stung by this yellow scorpion, especially if the victim is a child, hospitalization is recommended. Keep the victim calm during transport. Spiders are less thoroughly studied, but the PMNH has collected many species, perhaps over a hundred, whereas hundreds (perhaps thousands) more species remain to be collected and described. The known spiders in Palestine range from the very large Olive Black Spider (*Chaetopelmaolivaceum*) to the tiniest ones of 1 mm that live in leaf litter under oak trees. Spider stings in Palestine are rare and nonlethal, but care must be taken if an individual is allergic to such stings (this is true of most invertebrate stings, including those of bees and wasps). Within this group we also have the tiny pseudo-scorpions that are actually beneficial to humans as they prey on insect pests, the camel spiders that can be up to 15 cm long and that scared American soldiers in Iraq and may inflict a painful bite (that is, however, not deadly, as wrongful rumors have it), and ticks and mites (many of them parasitic).

Among invertebrates in Palestine are also millipedes and centipedes. The most common millipede is the Black Syrian Millipede that can be encountered in walks around most areas of Palestine, except in the very arid regions. Centipedes can be poisonous; however, these are less commonly encountered. But like the spiders, their poison is very mild, and the symptoms are usually a temporary irritation and/or swelling that generally dissipates quickly.

One of the most spectacular invertebrate species in Palestine is the tadpole shrimp (*Lepidurus apus*) that is commonly found in rainwater pools in places like Salfit, and upon which depends the survival of the endangered toad *Pelobates syriacus*.

There are over 150 species of land snails known in historic Palestine, ranging from a species that is the size of your hand (the invasive and introduced Giant African Land Snail) to microscopic ones of 1 to 2 mm in length. Some of us remember our mothers harvesting wild land snails (called Levantine's Snail) after the first rains in the hills and serving them as a delicacy. There are also many species of freshwater snails and even more marine snails.

Some invertebrates are associated with human disease. Parasitic flat and

Argiope lobata is a non-poisonous spider, common in Palestine. Females lay eggs in a sac and watch over it. Eggs hatch in the sac and remain there over winter to emerge in spring. Feeding on insects, spiders are among nature's pest-control agents.

A camel spider, also known as a wind scorpion, sun spider, or solifuge.

round worms may infect our digestive system, while ticks, mites, mosquitos, sandflies, house flies, cockroaches, and fleas are mainly a nuisance, to various degrees, even though some of these may transmit certain microbial or viral diseases. Generally, these parasites are becoming rare in modern households that are kept clean, with closed doors, and window screens. It is also common sense to remove old tires and eliminate from our surroundings other places where small amounts of water can be found, as these are favorite places for mosquitoes to breed.

But there are also hundreds of species of insects that are beneficial to humans. They range from ladybugs that eat aphids to the dragonflies that control insects of the wetland areas. Some invertebrates produce chemicals that are used in drug treatments for diseases that range from cancers to allergies, and research into the possible medical benefits of such substances is ongoing. Earthworms digest organic waste, and we can use their "products" as organic fertilizer and compost. Most people also do not know that without insects such as bees that pollinate our trees, we would not have many of the fruits and vegetables on which we depend in our diet. Bees, of course, are also kept for their honey, which is possibly the healthiest food per gram on earth. Domestic bees belong to a group of communal/social insects that include wild bees, wasps, and ants. There are lessons to be learned from watching these insects work together in cohesive, organized societies! Furthermore, all species of invertebrates are part of the earth's ecosystem, each with a role to play. Disturbing any part of this web of life can damage other parts, with consequences that may not readily be seen or predicted. Most of the songbirds of Palestine, for example, depend on insects, and the use of insecticide has depleted our bird fauna.

The rich biodiversity of invertebrates in Palestine is related to diverse habitats and climates that stretch from arid and semi-arid regions in the south to very humid areas in the north, and from the heights of Mount Hermon/Jabal Al-Sheikh to the lowest point on earth at the Dead Sea. As ecotourism begins to grow in our homeland, more and more people are learning to enjoy nature with all its animals and plants. Invertebrates are fascinating, whether they are the beautiful butterflies or the ubiquitous fly. These small creatures that share our world are just as much part of the landscape as birds and mammals (including humans). Together we must protect this rich natural heritage just as we cherish and protect the rich cultural heritage of our beloved Palestine.

Vanessa cardui, also known as the painted lady, is common in Palestine. It is known as a long-distance migrant species that spends summers in northern Africa and the Middle East, and breeds during winter in Europe, moving as far north as Britain.

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