

## Fauna regarded as pests in the Maltese Islands (2)

### The Flies

*By Arnold Sciberras*

It is a fact that the most hated of all insects are the cockroaches. Second runner-ups are the flies. The true flies are insects, scientifically known as Diptera which means two winged species. In reality they have also two pairs of wings like most other orders of insects but the second pair called halteres are small knobbed structures modified from the hind wings. They are flapped rapidly and function as accelerometers to help the insect maintain stability in flight. The presence of a single pair of wings distinguishes true flies from other insects with the common name ending as "flies". On unfrequent occasions some species of flies became wingless.

This large group consists of around 120,000 species worldwide but it is believed that more of the same amount are still not described, It is one of the major insect orders both in terms of ecological and human (medical and economic) importance. While the majority known are beneficial and of great importance to their local ecosystems only a dozen or so species are associated with human habitations while about a handful species are well known as pests. It is yet unknown how many species exist in the Maltese islands as new species are found frequently but a very rough estimate from local literature indicates that till 1995 over 218 species from 19 families were already known locally. Others have been recorded since. With these endemic species are included such as The Schembri's Spider fly (*Ogcodes schembrii*) Dubbiena tal-Brimb ta`Schembri.

Flies are well adapted for aerial movement, and typically have short and streamlined bodies. They have a mobile head with eyes, and, in most cases, have large compound eyes on the sides of the head, with five small ocelli on the top. The antennae take a variety of forms, but are often short, to reduce drag while flying. Flies consume only liquid food, and their mouthparts and digestive tract show various modifications for this diet. The majority of species spit out saliva on solid foods to predigest it, and then suck it back in. They also regurgitate partly digested matter and pass it again to the abdomen. The most apparently primitive flies have piercing blade-like mandibles and fleshy palps, but these have become adapted into numerous different forms in different groups. These include both the fine stiletto-like sucking mouthparts of mosquitoes, and the fleshy proboscis of houseflies. The gut typically includes large diverticulae (outpouching of a hollow or a fluid filled structure) allowing the insect to store small quantities of liquid after a meal.

When flies mate, the male initially flies on top of the female, facing in the same direction, but then turns round to face in the opposite direction. In some species, this forces the male to lie on its back in order for its genitalia to remain engaged with those of the female, but in most cases, the torsion of the male genitals allows the male to mate while remaining upright. This leads to flies having more reproduction abilities than most insects and at a much quicker rate. This is why

the flies come in great populations due to their ability to mate effectively and in a short period of time during the mating season.

The female lays her eggs as close to the food source as possible and development is generally rapid, allowing the larva to consume as much food as possible in a short period of time before transforming into the adult. In extreme cases, the eggs hatch immediately after being laid, while a few flies are ovoviviparous, (bear live young) with the larva hatching inside the mother

Aside from their bad reputation, there are practical roles that flies can play (e.g., flies are reared in large numbers in Japan to serve as pollinators of sunflowers in greenhouses), especially the maggots (young) of various species. Some types of maggots found on corpses have been found to be of great use to forensic scientists; specifically Forensic Entomology. By their stage of development, these maggots (and other insects) can be used to give an indication of the time elapsed since death, as well as the place the organism died. The lack of maggot presence is also telling in an investigation. Maggot species can be identified using their DNA. The size of the house fly maggot is 10–20 mm. At the height of the summer season, a generation of flies (egg to adult) may be produced in 12–14 days. Some other families of Insecta, feed on maggots. Thus, the lack of maggots would increase the estimated time of death. Other types of maggots are bred commercially, as a popular bait in angling, and a food for carnivorous pets such as reptiles or birds. Maggots have been used in medicine to clean out necrotic wounds and in food production, particularly of cheeses designed to rot as part of their 'aging' process.

On the other hand the House, Blue, Green and Flesh flies can be very loyal to our establishments and these are the ones that should be treated as pests. As a world wide perspective Diptera, in particular the mosquitoes (Culicidae), are of great importance as disease transmitters, acting as vectors for malaria, dengue, West Nile virus, yellow fever, encephalitis and other infectious diseases.



The Common housefly( *Musca domestica*),Dubbiena tad-Djar is the most common of all domestic flies, accounting for about 90% of all flies in human habitations, and indeed one of the

most widely distributed insects. The adults are 8–12 mm long. Their thorax (second part of the insect's body) is gray, with four longitudinal dark lines on the back. The underside of their abdomen is yellow or whitish in color, and their whole body is covered with hair-like projections. The females are slightly larger than the males, and have a much larger space between their red compound eyes. The mass of pupae can range from about 8 to 20 mg under different conditions. Each female fly can lay approximately 500 eggs in several batches of about 75 to 150. The eggs are white and are about 1.2 mm in length. Within a day, larvae (maggots) hatch from the eggs; they live and feed in (usually dead and decaying) organic material, such as garbage etc. They are pale-whitish, 3–9 mm long, thinner at the mouth end, and have no legs. They live at least one week. Later, the maggots crawl to a dry cool place and transform into pupae, colored reddish or brown and about 8 mm long. The adult flies then emerge from the pupae. The adults live from two weeks to a month in the wild. After having emerged from the pupae, the flies cease to grow; small flies are not young flies, but are indeed the result of getting insufficient food during the larval stage.



Some 36 hours after having emerged from the pupa, the female is receptive for mating. The male mounts her from behind to inject sperm. Copulation takes between a few seconds to a couple of minutes. Normally the female mates only once, storing the sperm to use it repeatedly for laying several sets of eggs. Males are territorial: they will defend a certain territory against other males and will attempt to mount any females that enter that territory.

The Blue Bottle fly (*Calliphora vomitoria*) Zarzura is a very common fly found in most areas of the world. It is 10-14 mm long, slightly larger than a housefly. The head and thorax are dull gray and the abdomen is bright metallic blue with black markings. Its body and legs are covered with black bristle-like hair. The eyes are red and the wings are clear. The legs and antennae are black and pink. The chest is bright purple and has spikes to protect themselves against other flies. A female blue bottle fly lays her eggs where she feeds, usually in decaying meat, garbage, or faeces. Pale whitish larvae, commonly called maggots, soon hatch from the eggs and immediately begin feeding on the decomposing matter where they were hatched. After a few days of feeding, they are fully grown. At that time they will crawl away to a dry place where they can burrow into soil or similar matter to pupate into tough brown cocoons. After two or three weeks, the adults emerge to mate, beginning the cycle again. During cold weather, pupae

and adults can hibernate until warmer temperatures revive them. They are also pollinators of some flowers with a strong odor such as The Fringed Rue (*Ruta chalepensis*) Fejgel.

The Green Bottle fly (*Lucilia sericata*). Dehbija tal-Hmieg. The maggots of this fly are known to preferentially consume dead tissue while leaving live tissue intact, and so have been sold for use in maggot therapy, primarily during the years before the widespread use of antibiotics and medicines and in modern times due to a resurgence of medical literature documenting their effectiveness. These flies are known to lay eggs in cadaver tissue in the wild within hours after death. The developmental stage of their larvae in the cadaver can be used to accurately predict the time death occurred. They are also generally found on faeces and also wild flowers. When specimens become old its green metallic color may change to red.

Another common house hold pest is The Fertoni flesh fly (*Sarcophaga fertoni*) Dubbiena Tal – Laham. as the common name implies this species breeds in carrion but also in dung or decaying material, in some cases also lay their eggs in the open wounds of mammals. These larvae, commonly known as maggots, live for about 5-10 days, before descending into the soil and maturing into adulthood. At that stage, they live for 5-7 days.

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