Flies - Diptera

of Belair National Park and surrounds

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The word Diptera comes from the Ancient Greek and literally means 'two wings'. It is this that distinguishes flies from most other insects which have four wings. In flies, the second pair of wings has evolved into a pair of club-like 'halteres' which serve as flight stabilisers. All flies have halteres. Many other insects are also given the common name 'fly' but it is the Diptera that are the true flies and have only one pair of wings.

Diptera are divided into two subgroups: the more primitive **Nematoceran Flies** and the more advanced **Brachyceran Flies**. The Nematocera have a longer body, longer legs, are more delicate and often have aquatic larvae. Their antennae can be quite elaborate. In this publication they include Mosquitoes, Midges, Gnats and Crane Flies. The Brachycera are more robust and are what we would ordinarily think of when we hear the word 'fly'. They have shorter antennae and their larvae are terrestrial. They include the remainder of the flies from March Flies onward..

As much as possible, I have organized this publication in the standard way, which is to follow this line of evolutionary development, from Mosquitoes through to Tachinid Flies.

The flies in Belair National Park are quite astonishing in variety and number, and yet I'm sure I've only just scratched the surface. Almost every week I find a 'new' fly I haven't seen before. I have photographed flies that are almost invisible to the naked eye, and seen others, like the Black-and-white Giant Fly, that take my breath away with their size.

On the one hand it surprises me that I am so passionate about insects and insect photography, but on the other, if I think back to my childhood, I kept Weevils as pets, and loved to wander my backyard with a Bug Catcher in hand. Perhaps life has a way of coming full circle.

I didn't start out taking photos of bugs though. Initially I took photos of fungi, kangaroos, flowers, trees, landscapes … But over time, as I looked at all these things, it became glaringly obvious that fundamental to our natural world, were BUGS. They were behind everything. Simply by doing what they do, they were keeping the whole ecosystem chugging along nicely, and yet most humans seemed oblivious to that fact. And not only that, we humans so often chose to malign bugs as undesirable or unpleasant, without ever looking closer or trying to understand them.

Bugs are truly amazing! Bugs fill every ecological niche … pollination, recycling, decomposition, symbiosis, predator, prey … it doesn't stop. When I walk around in the bush I see that every little bit is connected and vital to every other little bit. It takes my breath away and I walk around in awe.

I imagine this publication on Flies to be part of a larger publication on all the insects of Belair National Park. I hope it will open others' eyes to their beauty and their necessity. (And also the diversity of Belair NP!) Yes, flies can be annoying, but those annoying ones are only the tiniest minority … the rest are … well take a look! They're magnificent!

Acknowledgements

Thanks to **Tony Daley** of **www.tasmanianinsectfieldguide.com** for his passion for flies and his taxonomic expertise. Having someone to definitively identify the flies I found was invaluable and in many ways further stoked my passion for them (and for all insects).

Thanks to **Brett Smith** of Ellura Sanctuary, for his expertise and the extraordinary database he has put together of all critters great and small **www.ellura.info.** Additionally, his personal help and suggestions are always very much appreciated.

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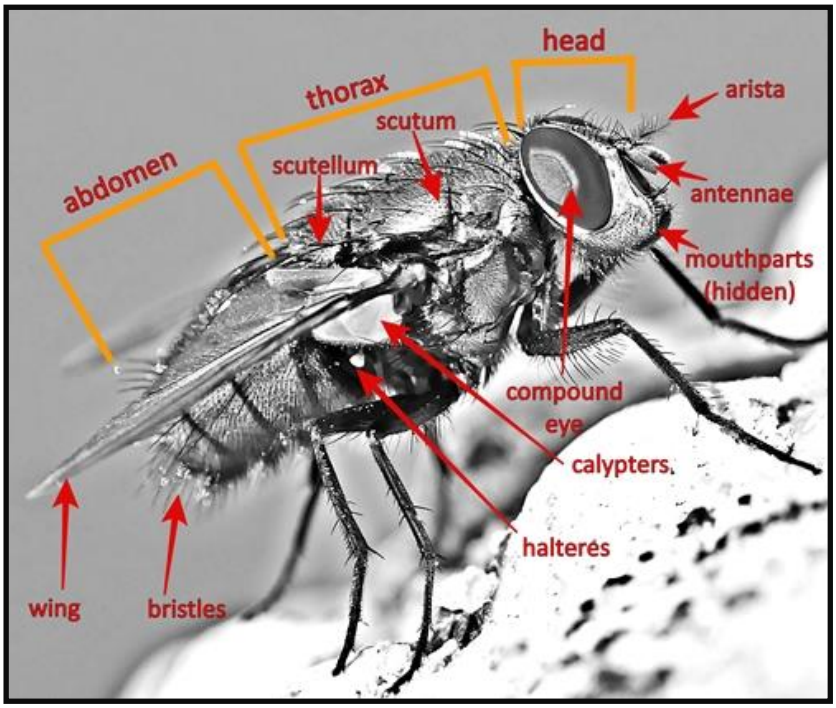
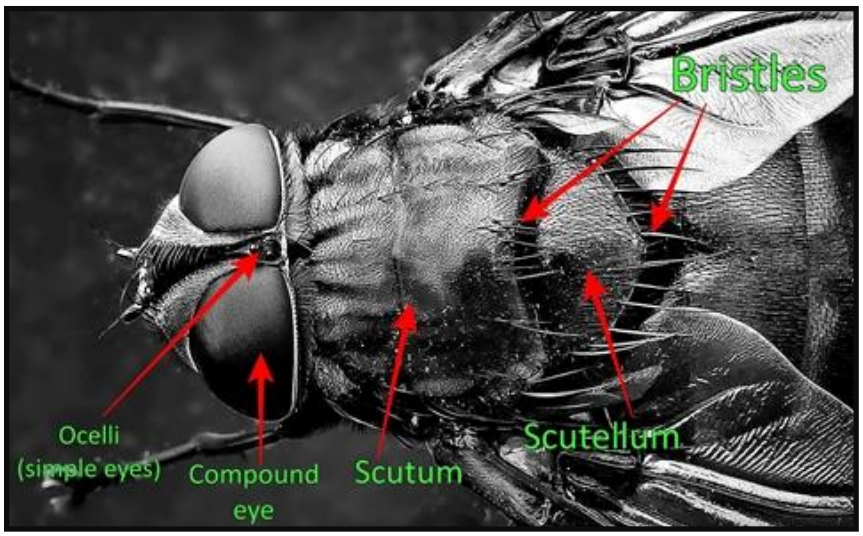
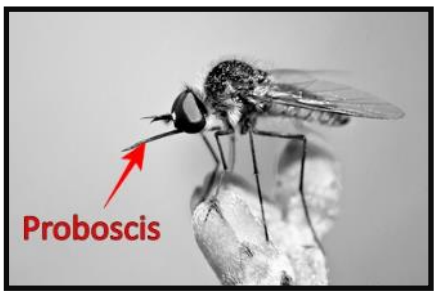
Front cover image: Eurygastropsis tasmaniae, a Tachinid (Bristle) Fly.

Anatomy







Life stages

Although none of these photos are from the same species, and there is immense variation in appearance between species, they still give a good idea of the life stages of flies.

Adult Flies mating.

Eggs (circled) laid on caterpillar.

Larvae feeding on fungi.

Pupae in remains of carcass.

Fly freshly emerged from its pupa. Wings have yet to develop.

Mosquitoes - Culicidae

The name **Culucidae** comes from the Latin 'culex' meaning 'midge' or 'gnat'. **Mosquitoes** are immediately recognisable by their small head and long needle-like proboscis through which they suck blood from their prey. Their proboscis also distinguishes them from the many other beautiful **Nematoceran Flies**. I have only photographed three Mosquito species. Undoubtedly there are many more!

Above: **Aedes nigrithorax** trying to bite me through my pants as I was sitting near water. Its substantial proboscis is trying to penetrate the fabric of my pants. It didn't succeed!

Above: **Southern House Mosquito Culex quinquefasciatus.** Note the sizable proboscis pointing forward.

Right: **Aedes notoscriptus** briefly stuck in a spider's web near Playford Lake. A rare sighting for Belair NP.

Phantom Midges - Chaoboridae

I came across the **Phantom Midges** by chance. I was walking around Playford Lake one day and saw lots of tiny bits of white 'fluff' in the air. Looking through a macro lens I saw they were tiny flies (1-2mm). **Phantom Midges** are an integral part of the food chain and ecosystem of lake/dam areas, providing food for dragonflies, spiders, fish etc. These are at the size limit of what I am able to photograph.

Comparison

Two species from one genus, **Chaoborus**.
Above: **Chaoborus ornatipennis**. Below: **Chaoborus vagus**.

Of note are the very plumose antennae of **Chaoborus sp.**

Gall and Forest Midges - Cecidomyiidae

The name **Cecidomyiidae** comes from the Greek words 'kekidomia' meaning 'gall' and 'myia' meaning 'fly'. These small flies are known for their ability to induce galls which serve as habitats for their larvae. It is rare to see the actual Midges, only the galls they produce.



Left : **Olearia Gall Midge, Trigonomyia ananas** is quite common in Belair NP on **Olearia ramulosa**. Note spherical shape and radiating 'leaves'. Also note larva forming inside a gall that was cut open.

Above: **Cecidomyiidae Midge**. Male. Unknown species. Note beaded antennae. Very small 2mm.

Left : **Dasineura glomerata** seen occasionally on **Acacia pycnantha**.

Left : **Asphondylia dodonaeae** seen fairly often on **Dodonaea viscosa.**

Non-biting Midges - Chironomidae

Chironomidae are often mistaken for Mosquitoes but it is immediately apparent that they have no biting proboscis. I have found **Chironomidae** everywhere, in the park and in the general area. They are very small and an essential part of the food chain and eco-system.



Above: Green female without plumose antennae. Below: Male **Chironomidae** with plumose antennae. Below right: **Chironomidae** mating on my car. Right: **Chironomidae** on **Pterostylis nana** orchid, perhaps as pollinator. Above middle: A myriad of **Chironomidae** caught in the viscosity of an **Elegant Blue Webcap, Cortinarius rotundisporus.**


Moth Flies and Sand Flies - Psychodidae

The name **Psychodidae** comes from Greek words 'psyche' meaning 'soul' and 'odous' meaning 'tooth'. Likely this refers to the supposed psychological effects that the bites of some **Sand Flies** can have. (**Sand Flies** are not seen in the area covered in this publication). **Moth Flies**, however, do not bite. The wings are covered with dense hairs, hence their common name which likens them to a Moth.

Bathroom Moth Fly, Clogmia albipunctata. A very common fly introduced to Australia. Identified by the black dots on the wings and the white spots along the edges. Frequently seen near drains and wet areas. Despite being thought of as a 'pest' they pose no ill effect on humans and are actually very valuable in numerous processes.

Pericoma illustrata. Beautifully patterned and with some iridescence. Interestingly the covering of dense water-repellant hairs on the wings make **Moth Flies** impervious to liquids, including drowning, toxins such as bleach and also boiling water.

Psychoda sigma. This species is notable for the whitish hairs and the grey zig-zag pattern on the wings. I saw many of these on an old decomposing Kangaroo carcass.

Lovebugs - Bibionidae

The name **Bibionidae** come from the Greek word 'bibion' which means 'small fly' or 'gnat'.

Left and right: **Bibio imitator**. These flies are given the common name of **Lovebugs** because they're so often found mating, particularly in large swarms. They are however not a bug but a **Nematoceran Fly**. They are also called **Compost Flies** because they're found near garden compost bins. They are completely harmless. These photos were taken near Railway Dam.

Right: **Dilophus sp**. female seen on my car in Belair NP. She found it difficult to fly off, perhaps because she was full of eggs.

Dark-winged Fungus Gnats - Sciaridae

The name **Sciaridae** comes from the Greek word 'skiaros', meaning 'shady' or 'dark', which refers to the habitat where these tiny flies are found. They are essential to the winter food chain and I see them everywhere. There are many many species.

Right: mating on fungi, right, presumably to then lay eggs in it.

Predatory Fungus Gnats - Keroplatidae

The name **Keroplatidae** comes from the Greek 'keras' meaning 'horn' and 'platid' meaning 'broad' or 'flat'. I haven't been able to find out what this actually refers to.

Left: A very distinctive species, **Macrocera mastersi**. Seen on the wall of my house.

Wood Gnats - Anisopodidae

The name **Anisopodidae** comes from the Greek 'anisos' meaning 'unequal' and 'podos' meaning foot. This likely refers to the uneven length of the legs as can be seen in the first photo on the left.

All photos are of **Sylvicola dubius.** The fly on the left was seen on my screen door. The two photos on the right were of a deceased fly. Note the tiny hairs on the wing (right).

Crane Flies - Tipuloidea (superfamily)

The name **Tipuloidea** comes from the Latin 'tipula' which means 'water spider' or 'water fly'. This is no doubt because they are associated with moist environments and bodies of water. **Crane Flies** may be mistaken for **Mosquitoes** but they are larger in size, have longer legs, a longer abdomen and have no piercing proboscis.

Above: **Discobola australis** Note translucent patterns on the wings, very long thin legs, and short clear halteres.

Above: **Helius sp.** Many of these seen on a cool, dark, shaded rock wall.

Below: A wonderful sighting! **Leolimnophila pantherina**. The first sighting for South Australia. Also the most westerly sighting for Australia. Note the spotted wings and long halteres.

Right: **Short-palped Crane Fly, Symplecta pilipes** on reeds. A commonly seen Crane Fly.

The beautiful **Orange-striped Crane Fly, Gynoplistia bella,** momentarily holding onto a reed near Playford Lake. Note the exquisite antennae.

Long-palped Crane Fly, Leptotarsus humilis, with close-up view of mouth parts and thorax.

March or Horse Flies - Tabanidae

Tabanidae are the first of the **Brachyceran Flies** in this publication. Their shape is quite different to the **Nematoceran Flies** that precede it. **March Flies** are generally known as a nuisance fly because they can inflict a painful bite on animals and humans. It is only the females that bite, as the blood provides the protein they need to produce eggs.
The name **Tabanidae** comes from the Latin 'tabanus' which referred to a type of Horse Fly.

The large **Flower-feeding March Fly, Scaptia auriflua** is one of my favourite insects in the park. Unlike other **March Flies** it does not bite and feeds solely on nectar. Its colouring and bright green eyes are very striking and beautiful. They seem to be quite solitary. Above: This fly landed briefly on a twig beside me as I was walking and I took a quick photo. Below: Feeding on **Leptospermum**.

Above: I have only photographed the large biting **Tabanidae** when they have landed on my car in the park. At other times I have simply been avoiding their bite! I have not been able to identify any of these **Tabanidae** to species or even genus.

Snipe Flies - Rhagionidae

Rhagionidae or **Snipe Flies** are a small family of flies related to the **March Flies** (see previous page). Their common name comes from the fact that their prominent proboscis can look like the beak of a snipe (bird). **Snipe Flies** are medium sized, with slender bodies and stilt-like legs. They have piercing mouthparts and feed on blood and are predatory on other insects.

Photos right, below and below right: **Atherimorpha sp.** is a **Snipe Fly** I see fairly frequently. Leaving its back legs dangling in mid-air over the edge of a leaf or flower is characteristic of this species! Apparently this can sometimes be to its detriment … exposing it to the risk of being nabbed by a spider lurking underneath!

Left: An unidentified **Snipe Fly** seen on the path in front of me.

Nose Flies - Rhiniidae

The name **Rhiniidae** comes from the Greek 'rhinos' meaning 'nose or 'snout'. This refers to their characteristic elongated proboscis. I have only see one species of **Nose Fly**.

Left and below: **Stomorhina subapicalis**. I regularly see this fly in summer but find it very difficult to photograph. The photos on the left were taken on a rare occasion that one sat still long enough to photograph from different angles.

Below: I generally see this species flying en masse. They make a very distinctive buzzing sound. They hover for prolonged periods, and then move very abruptly away. Also below, seen briefly on **Bursaria spinosa**.

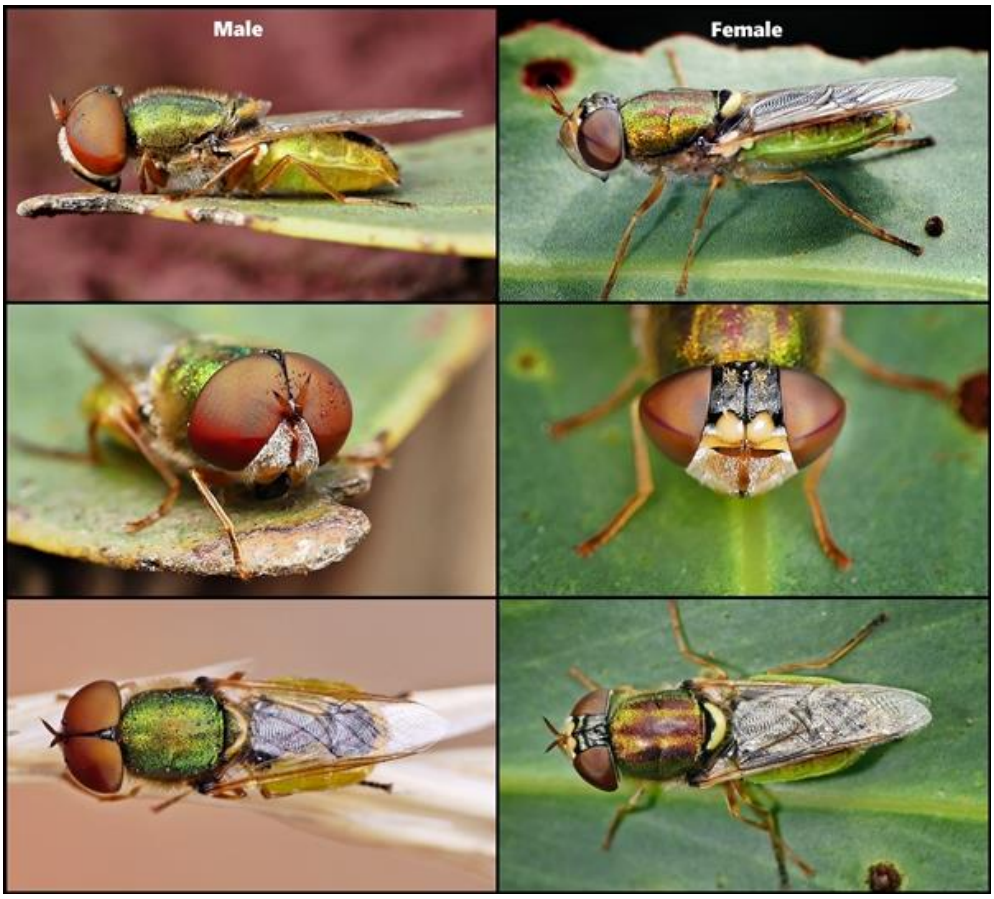
Interesting Info - The Eyes of Flies

Left is a collage of some amazing fly eyes that I've had the privilege of photographing! These lines and colours are a classic adaption in insects with good vision, allowing them to detect a much wider range of colour than with just standard photo-receptors.

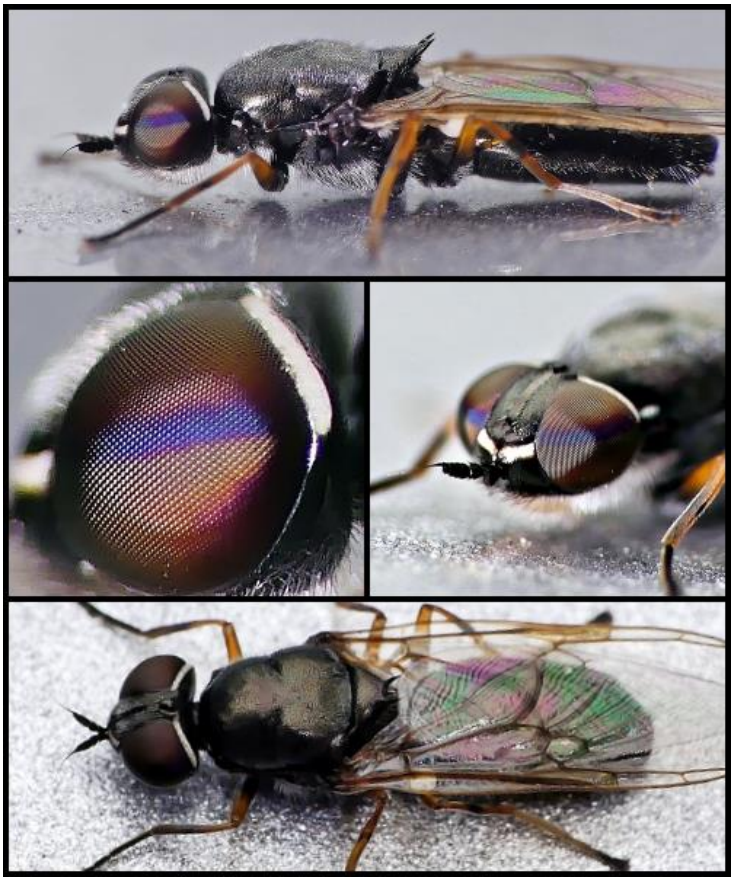
1. Soldier Fly, Octarthria sp.
2. Nose Fly, Stomorhina subapicalis
3. Stiletto Fly, Agaphophytus queenslandi
4. Soldier Fly, Acanthasargus stricta
5. Native Drone Fly, Eristalinus punctulatus
6. Soldier Fly, Odontomyia decipiens (female)
7. Stiletto Fly, Agaphophytus queenslandi
8. Flower-feeding March Fly, Scaptia auriflua
9. Soldier Fly, Octarthria sp.

Soldier Flies - Stratiomyidae

Soldier flies have a distinctive flattened body and large and often multi-coloured eyes. In my experience they can be quite placid.



Right: A collage comparison of the male and female **Green Soldier Fly, Odontomyia decipiens.** I've only seen these sporadically in Belair NP. Of particular note is the spacing of the eyes. The male has eyes touching and the female has eyes separated. Additionally the eyes are a very different shape and the female has a purple streak in the eyes. Perhaps this is an adaption for finding a male or for mating, but this is only conjecture. Also the colours on the scutum and scutellum between male and female are quite markedly different. A beautiful fly.



Below: Distinctive **Soldier Fly** larvae feeding on the fungus **Common Grey Disco, Mollisia cinerea**.

Left: Different views of **Acanthasargus stricta** seen on my car in Belair NP. On first sight an unremarkable fly, but on closer inspection very beautiful. Note the coloured stripe in the eye. See observation of **Octarthria sp**. on adjacent page for discussion.

Above and below:
Soldier Fly in **subfamily Antissinae**. Many times it is impossible to narrow organisms down to species.

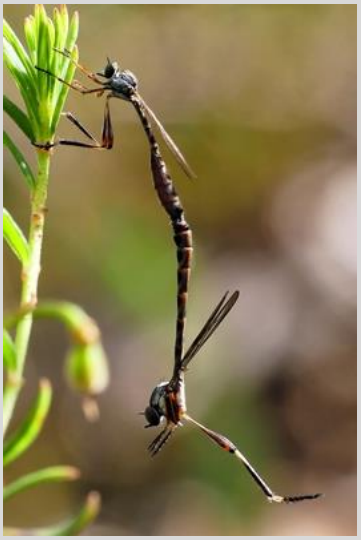
I have found **Chiromyza sp. Soldier Flies** very plentiful everywhere in the area, particularly during April and May. They are quite unspectacular and easy to dismiss, but are undoubtedly an important part of the food chain and ecosystem. Above is a male. Below is a female laying eggs in a grass head.

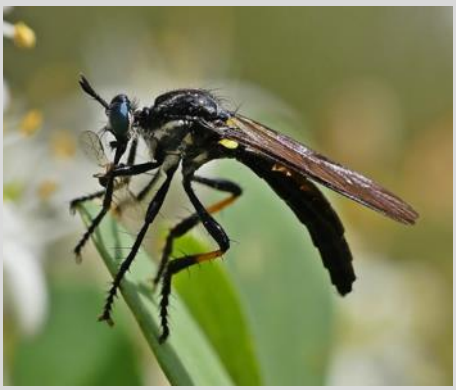
A small **Octarthria sp. Solider Fly** with stunning coloured bands in its eyes. These lines are a classic adaption in insects with good vision, allowing them to detect a much wider range of colour than with just standard photo-receptors.

Robber Flies - Asilidae

Robber Flies are very common throughout the park. They are impressive hunters. A number of times I have seen them catching prey on the wing right in front of me, impaling it with their beak-like mouthparts.
Right is a close-up photo of a **Herculean Robber Fly, Neoaratus hercules** that landed on my car right next to me when I was parked in Belair NP. It was a perfect opportunity to photograph this powerful animal and its majestic bearded head. It was perhaps 45mm long. Bottom right on this page is the whole fly.

Smaller Robber Flies





Not all Robber Flies are large. Here are two very small and delicate flies, not immediately recognisable as Robber Flies. Above: **Austrosaropogon sp.** with tiny winged prey. Left: **Slender Robberflies, Leptogaster sp.** mating. They are most vulnerable to predation when mating.

Above: **Cerdistus rusticanoides**. Below left: **Colepia rufiventris** caught this Dragonfly in mid-air right in front of me. Below: The very impressive **Herculean Robber Fly, Neoaratus Hercules** (also above).

Stiletto Flies - Therevidae

The name **Therevidae** comes from the Green word 'thereus' meaning 'hunter'. This reflects their predatory nature, as they hunt other insects for food. The common name of **Stiletto Fly** likens them to a stiletto knife ie. they have long and thin bodies and piercing mouthparts. Many **Stiletto Flies** are often wasp mimics, in the hope that they will look more ferocious than they actually are.

Taenogerella elizabethae. An elegant and distinctive Stiletto Fly seen both on my car and on an Acacia bush (right).

Above left and right: **Anabarhynchus** species. Quite a common sighting. ID only to species possible.

Right collaged photos: **Anabarhynchus plumbeoides**. A rare sighting.

Ectinorhynchus sp., Stiletto Fly. I saw this fly briefly and even debated whether to take a photo or not. In the end I was pleased I did. It is an undescribed species within this genus and the sighting was of particular interest to researchers and taxonomists at the Queensland Museum. The photo will be included in research papers.

Agapophytus queenslandi, seen on my car in Belair NP, has a much wider distribution in Australia than its name would suggest!

Bee Flies - Bombyliidae

I love the Bee Flies!

Bombyliidae is a large family. The name **Bombyliidae** comes from the Greek 'bombyle' which means 'buzzing' or 'bumble bee'. They are often quite fluffy and may be indeed be mistaken for a wasp or a bee. They can hover motionlessly, but also move very abruptly. At times it can be frustrating to get good photos of them! Many **Bee Flies** such as **Staurostichus sp. (**right) have a very large pointed proboscis for probing deep down into flowers. **Banded Bee Flies** (bottom right) do not have this long thin proboscis.

Genus Geron, Subgenus Plichtamyia. I had been aware of these tiny flies for a few seasons before realising that they were in fact **Bee Flies**!

As with many small flies, it is easy to disregard them as inconsequential, when they are actually vital within the ecosystem, both as pollinators and prey. I have watched as these were actively stalked by an **Australian Green Mantis**! Of note is their very sharp and long proboscis for stabbing deep into flowers, such as **Ixodia achillaeoides** (left).

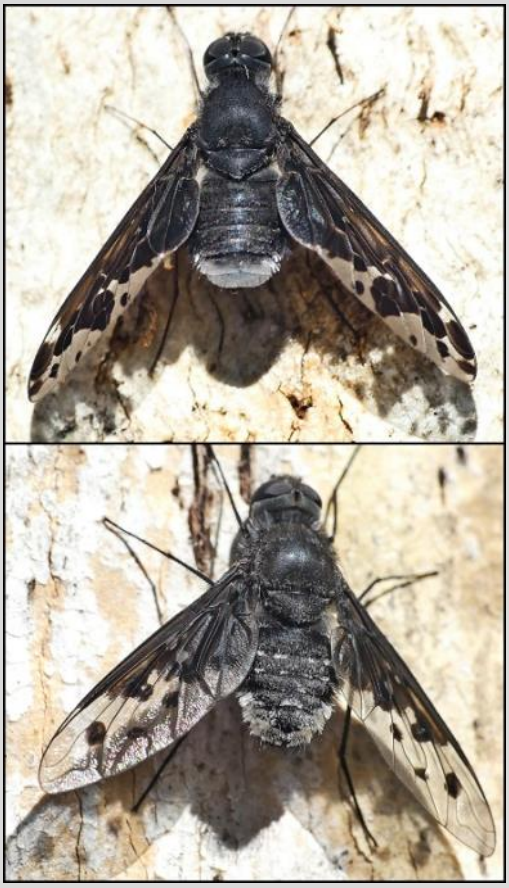
Left: Two photos of a **Black and Grey Striped Bee Fly, Meomyia sericans**. Its movements are so quick that it is very difficult to get a good photo. Note the distinctive black and grey colouring and its long thin proboscis.

Petite Bee Fly, Zaclava sp. An undescribed species. I knew this was something different when I saw its behaviour but in no way did I think it would be a Bee Fly! Very quick and very small. Note the halteres and bulbous legs. On **Ixodia achillaeoides.**

Banded Bee Fly, Tribe Villini. Note the distinctive banded abdomen and the lack of a long thin proboscis.

Comparison

Charcoal Bee Flies, Anthrax sp.
Top is **Anthrax maculatus**.
Bottom is **Anthrax comptus**.
Note different wing patterns.



Above: A **Micro Bee Fly** from the subfamily **Phthiriinae.** Very small at 3mm. Seen briefly on my car.

Below: **Comptosia sp**. A sizable long-winged Bee Fly seen often in one area in Belair NP. Always low to the ground. Note the exquisite long wings.

Comparison

Left: A **Long-winged Bee Fly, Aleucosia sp**. Below: **Aleucoia danielsorum**. Note the difference in the wing patterning and also in their body shape when compared with Anthrax sp. (above left).

Tangleveined Flies - Nemestrinidae

I have been unable to find the etymology of the name **Nemestrinidae**. The common name **Tangleveined Flies** refers to the veins of their wings, which may appear tangled or patterned like a maze.

Cyclopsidea sp.
A rare sighting of this species in Australia and this is the only Tangleveined Fly I have seen in Belair NP and surrounds. Refer here to discussion about this fly https://www.inaturalist.org/observations/191723490

I believe other species are more common, usually seen resting on vegetation as this one is. They are effective pollinators.

Signal Flies - Platystomatidae

The name **Platystomatidae** comes from the Greek words 'platys' meaning 'flat' or 'broad', and 'stoma' meaning 'mouth'. This refers to the wide or broad mouthparts characteristic of many species in this family. The common name **Signal Flies** comes from the distinctive visual signals these flies use for communication. These signals are used to carry out elaborate courtship dances, establish territory and attract a mate. Many times I have seen them 'signaling' with their wings and moving around in elaborate mating rituals.

Left and above: **Euprosopia sp.** I have seen these beautifully patterned flies in great numbers walking around and posturing on the trunks of Eucalypt trees.

Left and right: **Lenophila achilles** has a very striking yellow 'nose' and distinctive patterning on its wings. Seen here on **Xanthorrhoea semiplana.**

Rivellia sp. are by far the most common **Signal Fly** I come across.
Below: Sequence shows the characteristic wing movements of just one fly. This one was on the trunk of a Eucalypt tree.
Right: An interesting mating ritual which took place over time. The mating pair moved continually, always accompanied by the third onlooker in close proximity.
Right below: Fly showing beautiful abdominal markings. It is impossible to ID any of these to specific species.

Left and right: **Duomyia sp.** a very placid fly that walked onto my finger as I was photographing it.

Fruit Flies - Tephritidae

The name **Tephritidae** comes from the Greek word 'tephros' meaning 'ashen' or 'gray' and likely refers to the colour of their body. They do however have very distinctive markings on their wings.

Unfortunately **Fruit Flies** have a bad name, but as is so often the case, it is only a tiny handful of this family that pose problems as pest species. The vast majority are exquisite little flies with beautifully patterned wings and a vital place within the ecosystem. The first time I spotted a tiny fly with what appeared to be black suns on its wings I was smitten. I went in search of more and have so far seen seven species, always on flowers. Undoubtedly there are more and I will continue looking for them. Names of the flies are included on the collage.

Shore Flies - Ephydridae

The name **Ephydridae** comes from the Greek word 'ephys' meaning 'midge' or 'gnat'.

Left: **Water Floating Fly, Brachydeutera sydneyensis**. Right: **Hydrellia sp**. on **Acacia pycnantha**.

I saw many of these tiny flies (left) in seasonal wet sludge by the side of the road. Specialised hairs on their feet allow them to 'walk' on water. Although they are called **Shore Flies** they are not necessarily restricted to coastlines. I've also seen them on flowers (right).

Long-legged Flies - Dolichopodidae

The name **Dolichopodidae** comes from the Greek word 'dolichos' meaning 'long' or 'extended', and 'pous' meaning 'foot'. **Dolichopodidae** are small (under 10mm) and often very shiny and metallic. Most have slender bodies and a distinctively elevated stance when at rest. They are very common in Belair NP and surrounds, often seen sitting on leaves and other foliage, before taking quickly to flight.

Above: A selection of flies from **Heteropsilopus sp** which is commonly seen everywhere.

Above: A selection of flies from **Parentia dispar** which is also a commonly-seen species.

Hydrophorinae, are a sub-family in **Dolichopodidae**. They are found in or near fresh water. I found these small flies in puddles on Lodge Track after a period of prolonged rain. In the mating photo on the left, the female is eating something. I wondered whether the male had brought a 'gift' prior to mating as can be the case with some fly species (see **Dance Flies**). Of note is their use of the surface tension of the water.

Left: Diaphorus sp. with distinctive striped abdomen.

Hover Flies - Syrphidae

The name **Syrphidae** comes from the Greek word 'syrphos' meaning 'gnat' or 'mosquito'. **Syrphidae** are important pollinators and are very active around all flowers in the park. I find them delightful to watch.

Comparison

Above: **Yellow-shouldered Stout Hoverfly, Simosyrphus grandicornis** clearly showing the distinctive yellow 'shoulders' on the thorax. On **Thysanotus patersonii.**

Above: **Common Halfband, Melangyna viridiceps**, can initially look similar to the Yellow-shouldered Stout Hoverfly, but has a wholly black thorax. On **Xanthorrhoea semiplana.**

Left: A small dark Hoverfly, **Psilota sp.**

Right: Almost translucent tiny Syrphidae larva with twin tubular structures on its rear end. Seen on **Acacia pycnantha** and approx. 7mm.

Comparison

Left and above: **Native Drone Fly, Eristalinus punctulatus**, with its striking spotted eyes.

★ Above: **Common Drone Fly, Eristalis tenax,** is an introduced species seen here in the Old Government House gardens.

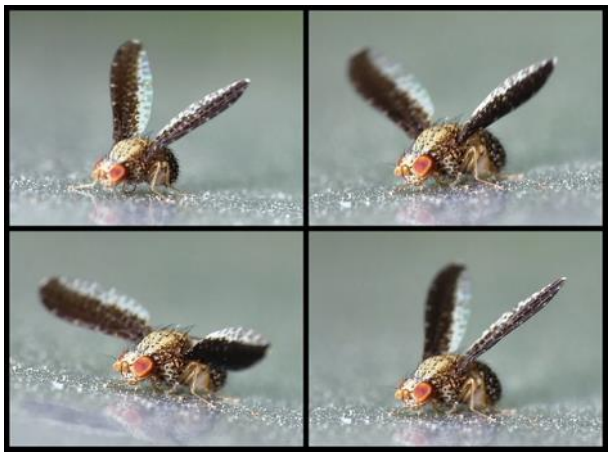
Above: A **Yellow-shouldered Stout Hoverfly, Simosyrphus grandicornis** showing its characteristic 'hovering' behaviour as it approaches a **Brunonia australis** flower.

Above: An **Inflated Hoverfly, Cyphipelta rufocyanea** on Leptospermum sp. The reason for the distinctive 'inflated' bits is unknown. A rare sighting.

Lauxaniid Flies - Lauxaniidae

The name **Lauxaniidae** originates from the Greek 'lauxanios' meaning 'luscious' or 'delightful'. **Lauxaniidae** are difficult to describe, except for the fact that they are small (2 - 7mm) and sometimes orange-ish. Many are quite beautiful when seen close-up. Some of my sightings in Belair NP have been on my car, simply because they are easy to see on a blank background.

Left and right: **Trypetisoma digitatum**. A wonderful little fly with intricate markings and spotty wings. 4mm. Note the collage of wing movements (right) which are reminiscent of **Signal Flies**. A firm favourite!



Left: **Ceratolauxania sp**. Two different species. Note black colourings.

Right: **Minettia sp.** is frequently seen.

Sapromyza brunneovittata, male and female.

Homoneura binotata

Meiosimyza sp.

Meiosimyza appula

Flat-footed Flies - Platypezidae

Lindneromyia sp. A very small fly that moves in rapid angles over a surface. Left is the lighter-coloured female with separated eyes. Right is the darker male with eyes touching. This difference in the eyes between male and female occurs in many species of fly, but not all. (See also my photos of Odontomyia decipiens under Soldier Flies).

Cheese Skipper Flies - Piophilidae

Piophilosoma antipodum. I found a myriad of these small flies on a kangaroo carcass. The **Piophilidae** family as a whole are scavengers of animal waste, carrion and fungi. Interestingly these are the flies used in forensic entymology and medicocriminal investigations, often suggesting the time of death. Additionally, their ecological value in decomposition cannot be underestimated, as it underlies much of the web of life. Without them we would be waist-high in dead things.

Humpbacked Flies - Phoridae

The aptly-named **Humpbacked Fly, Family Phoridae**, on my car in Belair NP (right). It's fascinating to come back to my car after a walk and see what's on it. On bark, trees, or the ground these tiny flies would be invisible. There were quite a number of these flies, perhaps 2mm in length and they seemed to prefer running along rather than taking flight.

Frit or Grass Flies - Chloropidae

The name **Chloropidae** comes from the Greek 'chloros' which means 'green'. Presumably because these flies are often a green colour and associated with green habitats such as grass.

Chloromerus sp. (left) is probably the smallest fly I have seen. I only saw it because it was stuck in the stickiness of a Drosera.

Dance Flies - Empididae

My first encounters with **Dance Flies** were quite fleeting, simply because they are so very small and quick.

I saw the very small (2mm) **Dance Fly** (far left) on an **Acacia pycnantha** leaf one day while looking at **Psyllids**. I researched it a little, and read that these flies are mostly predatory with piercing mouthparts. Shortly after, I saw the tiny fly (near left) with an even tinier **Fungus Gnat** as prey and knew it must be a **Dance Fly**. Both are **Tribe Chelipodini.**

Waterbuzz Danceflies, Hilarempis sp.

I saw many of these small flies skimming rapidly over the surface of a winter creek. I was intrigued by their behaviour so sat on a log and watched them. I later did some research.

The males (left) have an enlarged basitarsi on their front legs which has silk producing glands. They use this silk to wrap 'nuptial' gifts (typically small prey, other objects or sometimes just silk) for a potential interested female (two females see right).

Below are males carrying their silk-wrapped gift and below right is a meeting between male and female at the water's edge, and the exchange of the gift. This happened very rapidly and with much commotion.

Hybotid Dance Flies - Hybotidae

The name **Hybotidae** comes from the Greek 'hybos' meaning 'hump' or 'lump' and refers to the hump-like appearance of these flies. Like the **Empididae** (below) they are known for their intricate courtship dances and predatory behaviour.

Right: **Hoplopeza pulcherrima.**

Heleomyzid Flies - Heleomyzidae

Fungus Fly, Tapeigaster cinctipes (three photos above and right)**.** This is one of my favourite interactions with a fly. I was actually trying to take a photo of the mushroom it was sitting on, but the little fly just wouldn't budge regardless of my activities. Flies are usually very flighty so I wondered why this one was not. When I got home I did some research. Apparently the male claims a mushroom as its territory and then sits and protects it. It waits for a female to mate with and the eggs are then laid in his mushroom on which the larvae then feed. He will stand up to any males (or photographers apparently) who wish to claim his mushroom. Beautiful markings.

Pentachaeta sp. I have found these tiny flies en masse on entrails and dung. Their larvae feed on animal waste, carrion and fungi..

Tapeigaster nigricornis is the most common Tapeigaster species I see. As with its family member showcased above it is associated with fungi and is approx. 6mm in body length.

Lesser Dung Flies - Sphaeroceridae

The name **Sphaeroceridae** comes from the Greek 'sphaira' meaning 'sphere' or 'ball' and 'keras' meaning 'horn'. This refers to the rounded antennae.

They are referred to as **Lesser Dung** or **Lesser Corpse Flies** because of their saprophagous habits and because unlike the larger 'corpse' flies, the **Calliphoridae** (following pages) they are Acalyptrate. They are a close relative of **Heleomyzidae** (previous page).

Rachispoda sp.
A chance sighting of a tiny fly on my car. Nothing special but a fly and a family of flies I had never heard of. Every investigation is interesting!

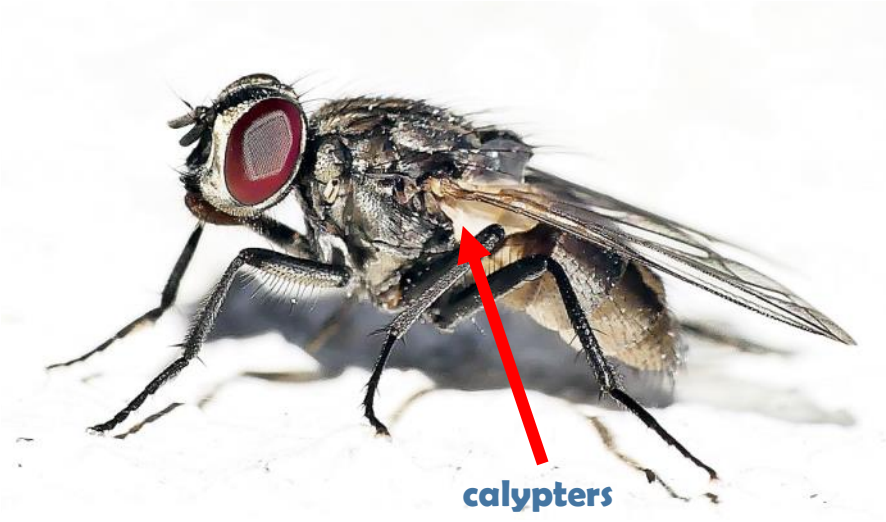
House Flies and Allies - Muscidae

Muscidae have the common name of **House Flies** because some are synanthropic - they live near humans and benefit from our changes to the environment. We tend to see them as pests because they live in such close proximity to us and feed on 'waste', even though this activity is vital to keeping ecosystems healthy. Although a minority can transmit bacteria and disease from rubbish and faeces, the majority of Muscidae go about their business far removed from our lives.

Muscidae, along with the families of flies that follow are all '**Calyptrate'** flies and are what most people think of when the word 'fly' is used . ('Musca' literally means 'fly' in Latin). All the previous families do not have calypters and are called **Acalyptrate Flies**. See photo below with red arrow pointing to the calypters, the two membranous lobes hidden below the wings. They are over the halteres (balancing organs) which are also at the base of the wings but shaped like small clubs. All flies have halteres.

★

Common House Fly, Musca domestica
Introduced.



Helina sp. is a very large genus of Muscid Fly, with around 40 Australian species. Photos show Muscids caught in Hound's Tongue (right) and also by a Long Green Crab spider (left below). Red arrow shows location of the **calypters.**

Helina colossi on a park sign. Note distinctive wing patterns.

Tribe Muscini.

Black Dump Fly, Hydrotaea sp.

Black Carrion Fly, Australophyra rostrata seen on a Kangaroo carcass.

Helinomydaea flavofusca.

Pygophora apicalis.

Blow Flies - Calliphoridae

Although the **Calliphoridae** are known for eating meat from carrion and open wounds, most are actually parasites of other invertabrates. Their common name comes from the fact that we talk of livestock or meat being 'fly-blown'. As with the **Piophilidae** they are used by forensic investigators to estimate a 'time of death'. Many are metallic green or blue in colour, hence the names **Greenbottle** or **Bluebottle.**

Bluebottle Fly, Genus Calliphora.

Greenbottle Fly, Genus Lucilia.

Right: **Calliphora dubia**. Not a great photo, but this is a fly I see reasonably often, but find difficult to photograph. Distinctive yellow, blue and white abdomen.

Left: **Genus Amenia**. Also not a great photo but I was so pleased to see this beautiful spotted fly. I only had a moment to take a photo before it flew off.

Flesh Flies - Sarcophagidae

Sarcophagidae have similar habits to **Calliphoridae,** and the name literally means 'flesh eaters'. **Flesh Flies** are generally grey, although can also be pale yellow. They have three distinctive stripes along their thorax.

Above: Two examples of **Common Flesh Flies, Genus Sarcophaga.**

Abvoe: Fly pupae in the stomach remains of a decomposed Kangaroo carcass. These are most probably from carrion flies (ie. Flesh or Blow Flies).

Bristle Flies - Tachinidae

The **Tachinidae** are a very large and commonly-seen group of Flies. They play an massive role in the environment as parasites of plant -eating insects. Eggs are laid mostly on caterpillars but also other bugs. Their larvae (maggots) bury themselves inside the host, eventually killing it. When ready to pupate it will move into the soil, although some will remain and pupate in the host. Most Tachinids have prominent bristles on their rear end, but also on their thorax.

Above: A nail-biting encounter! **Exoristinae sp.** actively stalking a **Painted Apple Moth** caterpillar to lay eggs/parasitise it. I came upon this fascinating interaction by the side of the path. Very slowly and methodically the fly tried to determine its best angle of attack through the caterpillar's spines/setae. The fly's abdomen then curved under and the ovipositor slowly and carefully moved forward to lay an egg. The fly was utterly intent on its task, seemingly ignoring my presence.

Below: **Rutilia sp.** A beautiful large fly seen on my car.

Above: **Amphibolia ignorata**. A large and beautiful fly, approx. 23mm in length. Seen on my garden shed.

Right: **Black and White Giant Fly, Formosia speciosa.** Such an exciting encounter with a large fly. It was freshly emerged from its puparium, which had most probably been in the ground. The wings are still undeveloped. In the third photo the remains of the ptilinum can be seen (circled) as it starts to collapse. This is a special structure used by Schizopheran Flies to escape the puparium. In the first photo (which was taken later) the ptilinum has disappeared. The fly itself was slowly making its way up the tree, eventually to disappear from sight. Another fly of the same species was continually flying around, well aware of this one's presence.

Above: **Eurygastropsis tasmaniae.** A distinctive and placid fly with a white bottom. Despite the species name, it is widespread on the mainland, though easily missed because it's not a fly that annoys us humans!

Above: **Senostoma sp.** Seen quite frequently in Belair NP mostly walking around on tree

Above: **Rutiliini** (tribe). A very large and colourful fly seen only briefly before it

Chlorotachina (genus)

Microrutilia (subgenus) on Bursaria spinosa. Proboscis visible.

Trigonospila sp. I've seen these fairly frequently in recent seasons.

Macrochloria sp. An interesting fly quite similar to both Eurygastropsis and also Calliphoridae. Confirmed by its wing venation to be a relatively rare Tachinid.

Golden Tachinid Fly, Microtropesa sinuata. A large fat Tachinid and a firm favourite of mine. Their buzz as they fly is quite audible and unique; I often hear them before I see them. It has large reddish eyes on a golden-coloured head and many bright white markings on its abdomen and thorax. A beautiful fly.