WINGS…

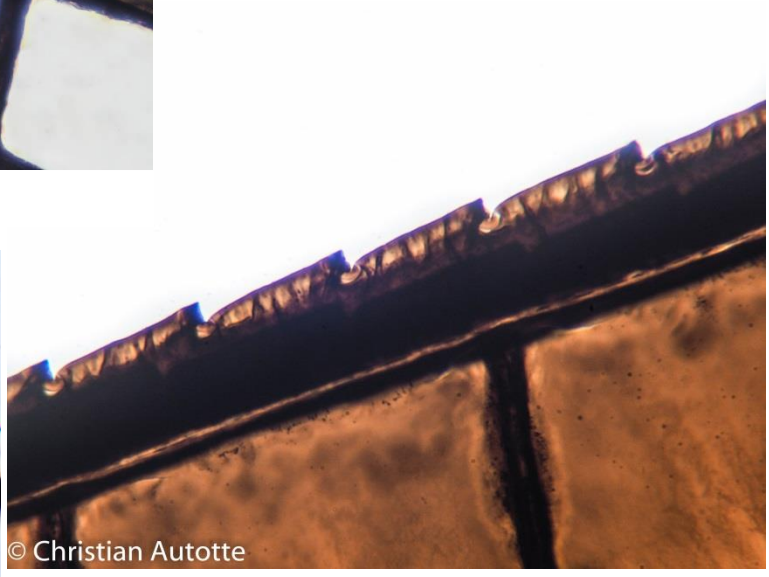
Insects' wings are fascinating. They were the first creatures to take to the air, and consequently they had a lot of time to evolve different apparatus to fly. Some wings are clear membranes, others are covered with scales. Most insects have developed four wings, but the more recent families have reduced their wing to a single pair. And some that may seem to have two wings really have four… Confused? I went back to my slide collection and took a look at insects' wings diversity.

Dragonflies were among the first insects to take to the air. For the microscopist, their wings are not the most interesting, being transparent and simply crisscrossed with simple veins. However, the front edge often looks like a saw blade bordered as it is with a series of sharp spines. That is something we will see in several insect families, which makes me think that it may have and aerodynamic advantage.

Dragonfly wing, 100x

While going over a dragonfly wing in search of interesting compositions, I came upon a surprising subject: a diatom stuck on the wing. Dragonflies live near water and I have often seen one dip in water, either to catch an insect near the surface or as a result of a false manoeuver. That may explain why a diatom ended up stuck on an insect that spends most of its time airborne.

Diatom on dragonfly wing, 100x



Darkwing Damselfly, 100x

Deer Fly wing, stack of 5 images, 200x

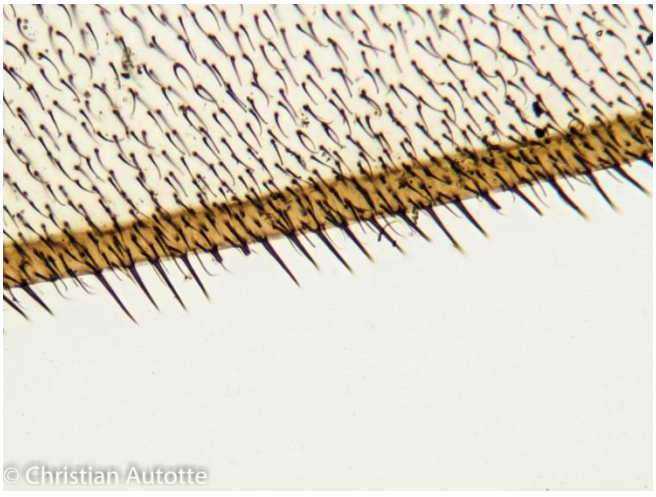
Instead of saw blades, some insects sport a row of sharp spines on the front edge of their wings. These may serve the same purpose, or they may be more complex mechanisms to monitor air speed and wing position while the insect is in flight. Deer Flies, Tipulid Flies, and many other species have similar rows of hairs on the front edge of their wings.

At the opposite end of the wing, we often find another row of long hairs; these are usually thinner and longer than the hairs of the front edge.

Tipulid wing, stack of 7 images, 100x

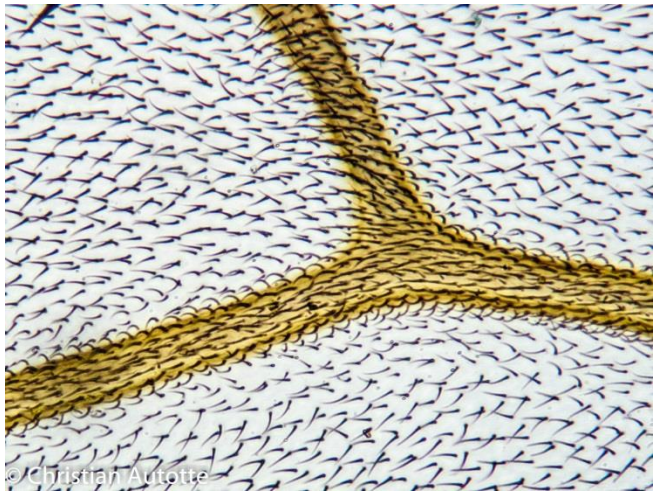
Deer Fly wing, 200x

Tipulid wing, 200x



Horse Fly wing, stack of 8 pictures, 200x

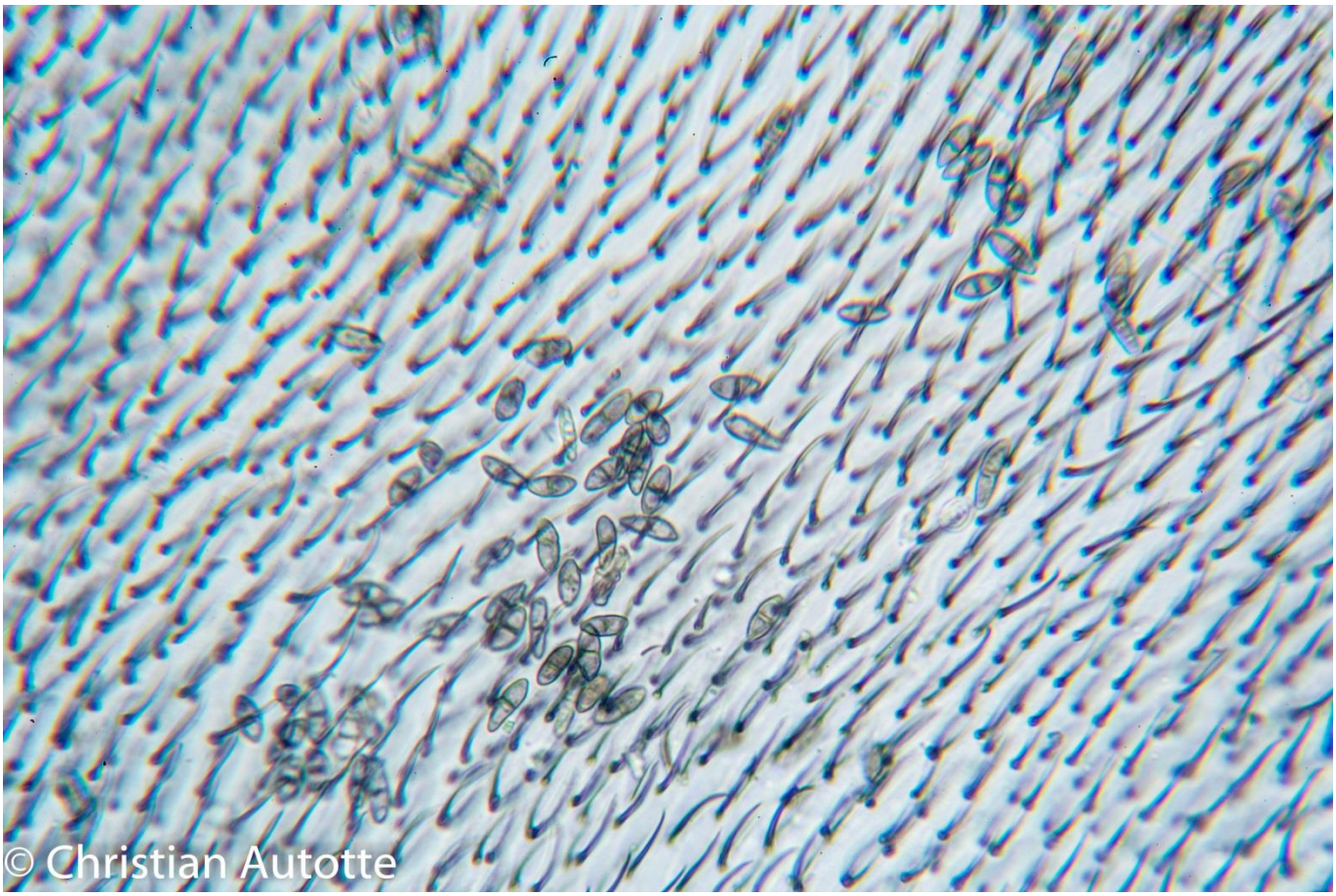
Deer Fly wing, 100x



Deer Fly wing, 200x

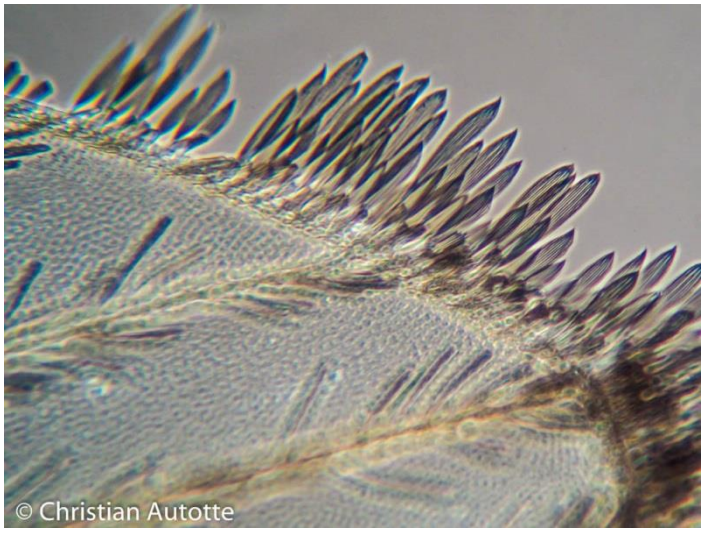
Hairs are not limited to the edge of the wings. In many species the wings are covered with hairs.

Once again, I was surprised to find some organism stuck on a fly's wing. This one was a Horse Fly wing, and there was a lot more than a single diatom. I have been unable to identify what these are, but there are a lot of them…



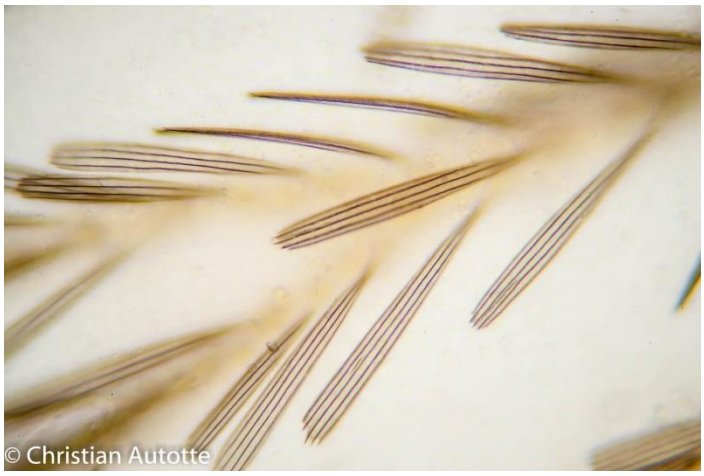
Organisms on a Horse Fly wing, 400x

Mosquitoes have a variation on the hairs: they sport both hairs and delicate scales all over their wings. Unless dislodged, the scales are on the edges and on the veins, while short hairs are in the space in between. The scales are very delicate and fragile with a few veins, the number of which varies with the species.

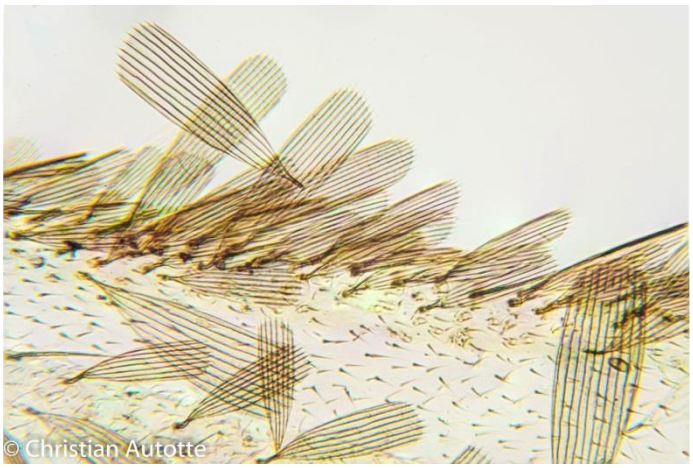


Mosquito wing, phase contrast, 200x

Mosquito wing, 40x

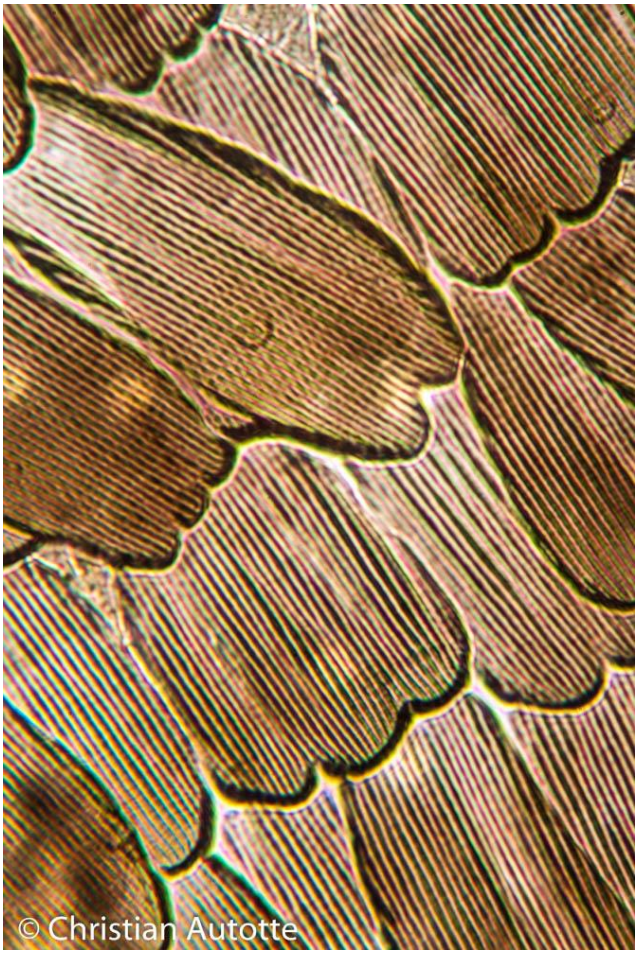


Mosquito wing, 400x

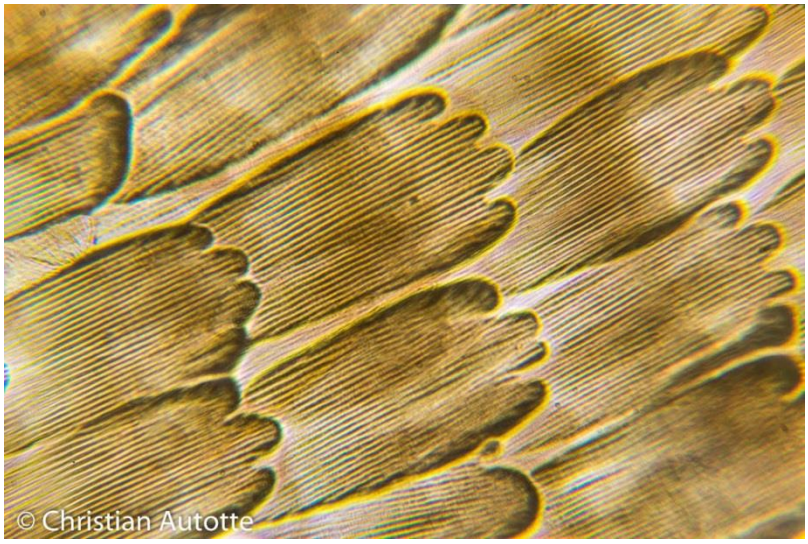


Mosquito wing, 400x

Mosquito wing, 40x



Pearly White, 100x



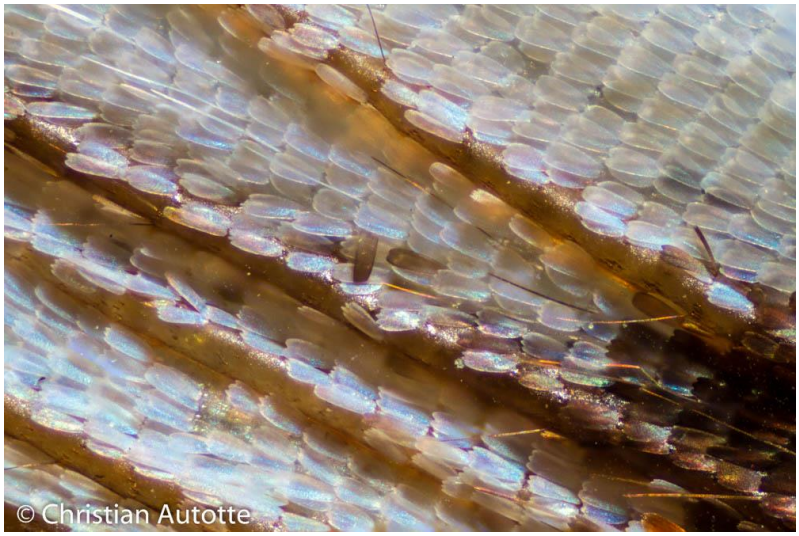
Pearly White butterfly, 100x

Some old slides in my collection have degraded somewhat over the years. Nevertheless, I can still get decent pictures with the proper control of my light. I could get rid of those old slides, but curiosity makes me keep them and go back for a new look every now and then…

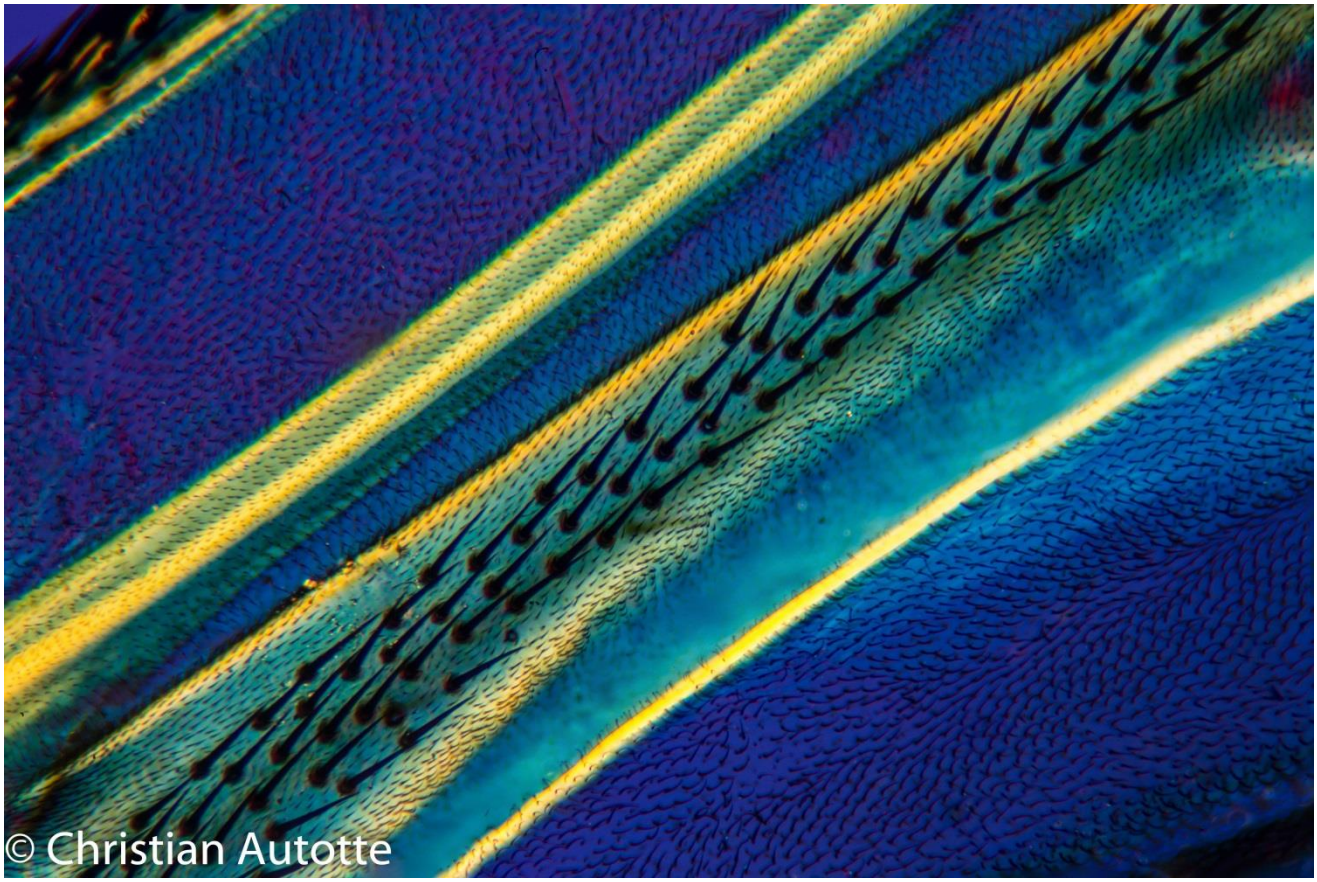
These scales from butterfly wings came from such slides. In some cases, a fair amount of post processing was needed to get a decent picture…

Cecropia Moth scale, 100x

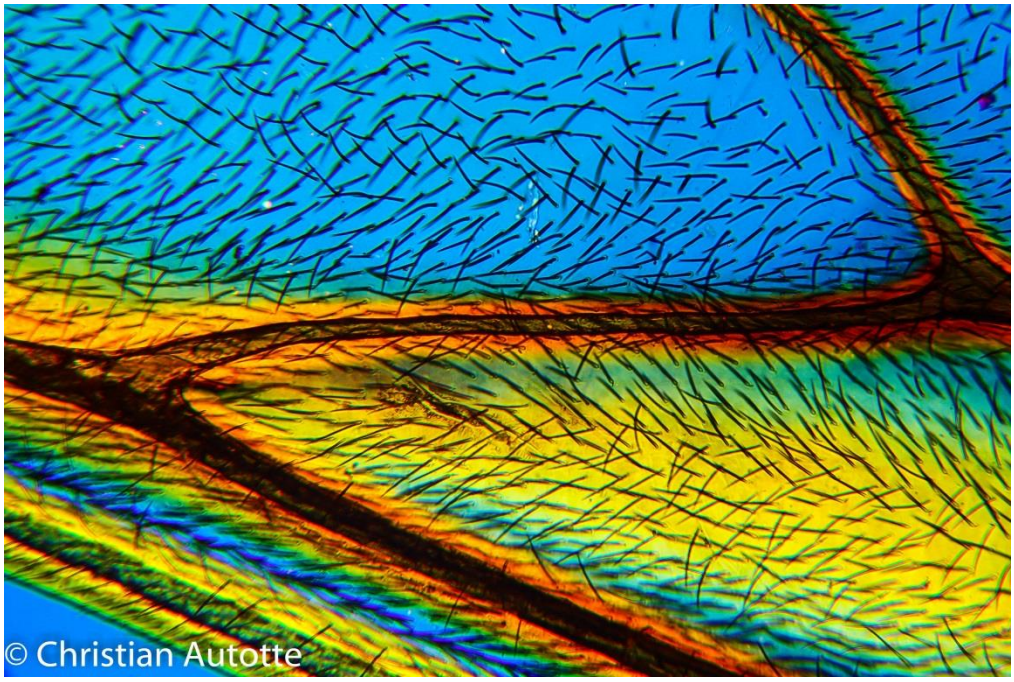
Luna Moth, 40x



These pictures were shot with a modified microscope equipped with a focus motorized stacking rail. I have several such butterfly wings, which are kept in airtight containers to keep them free of dust. The proper lighting is essential to get all the details in the scales.

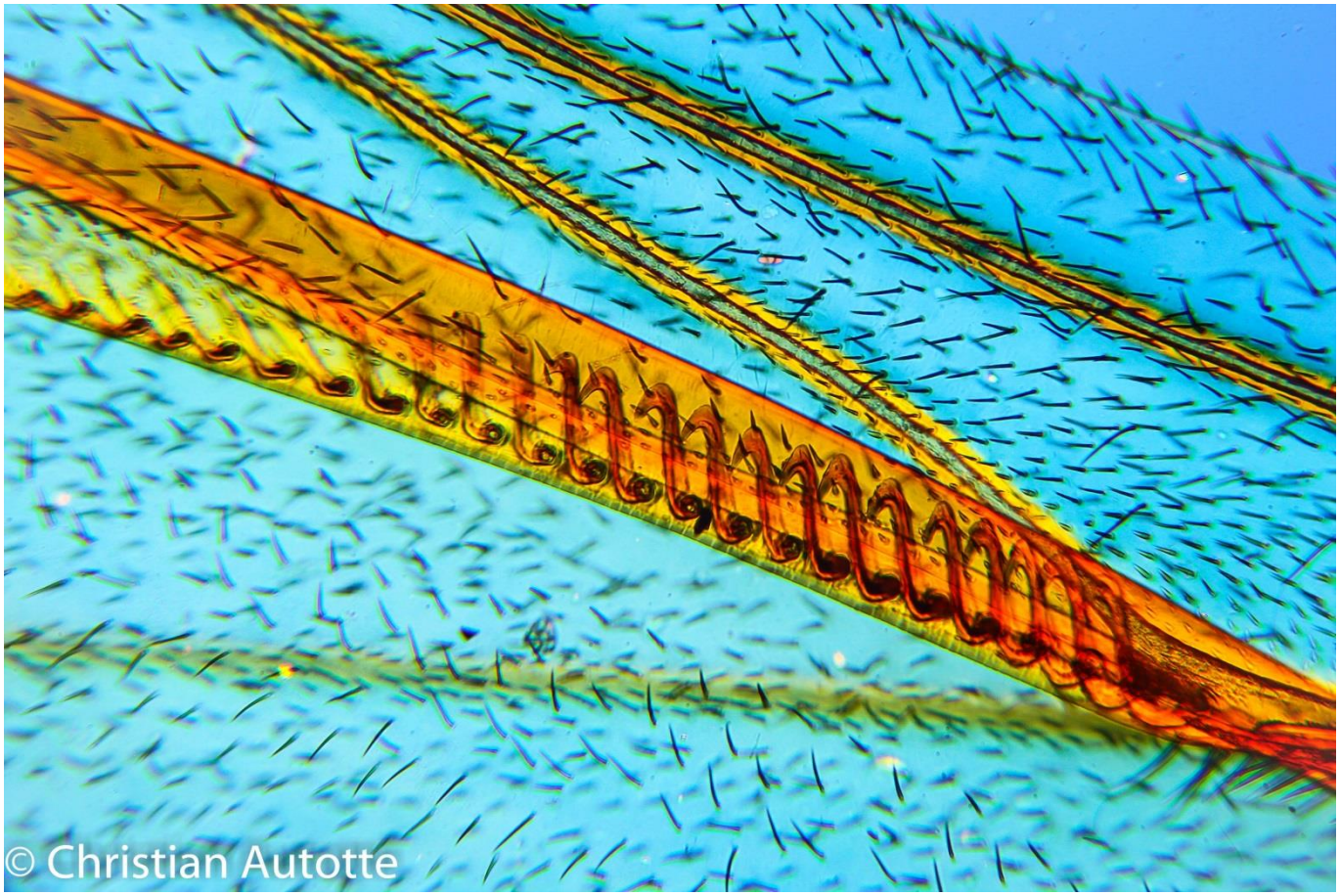


Horsefly Wing, 100x, polarized light



Yellow Wasp wing, 100x, polarized light

Polarization can add a lot of colors to many insect wings. It will work with the transparent wings, like those on flies or wasps.



Yellow Wasp wing, 100x, polarized light

Some wings are very unusual. To the casual observer, bees and wasps seem to have only two wings. But in reality, they have four; they are linked together at their edge by this strange organ, the hamuli, which is Greek for “tiny hooks”. Set at the edge of the hind wings, the hamuli attach to the forewings with a surprising amount of strength; the two pairs of wings can then act as a single pair, which is more efficient.

Katydids are known to be well camouflaged; their green forewings look like leaves, which make them difficult to find in their natural environment. This mimetism extends even to the microscopic level, as seen with the picture seen here.

Katydid forewing, 40x

Hovering Horsefly

Flies are the most advanced flying insects. One species of male Horseflies (Hybomitra hinei) is reputed to reach 145 kph! They are also able to hover on the same spot for several seconds when looking to mate with passing females.

During their evolution, they got rid of one pair of wings. Or did they?

Robber Fly haltere, 100x, polarized light

Actually, the hind pair was modified during the millions of years and became what is now known as the halteres. They vibrate along with the wings and act little gyroscopes. Sensors at the base of the halteres transfer informations to the insect, allowing it to know its exact position in the air.

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Fly haltere, 100x