

Dragonflies and Damselflies of Spencer's Pond, Langford

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The Biology of Dragonflies and Damselflies

Dragonflies and damselflies are ecologically important invertebrates and naturalists can help by studying them as indicators of ecosystem health. They are upper-level predators in aquatic and semi-aquatic habitats, often dominating the large invertebrates, especially in places where there are no fish. They usually inhabit the edges of water bodies, living as larvae in shallow water and as adults mostly in the rich zone between dry land and open water. Many species live only in particular habitats and their presence can be used to characterize healthy wetlands of all sorts. Also, unlike most invertebrates, adult dragonflies and damselflies are identifiable in the field, many even by beginners. Dragonflies and damselflies are well-suited for long-term monitoring programs. Finally, because these large, colourful, diurnal creatures have interesting behaviours and are easy to watch, and because the aquatic larvae can readily be kept in captivity for observation, they are excellent subjects for nature interpretation programs and public education about aquatic ecosystems in general.

The insect order Odonata (Greek for “toothed jaws”) contains both the groups of insects known in English as the dragonflies and damselflies. The term “odonates” is also sometimes used for the insects in this order. The Odonata is a small order of insects of about 5,500 named species and 33 families worldwide. It is predominantly tropical in distribution and is not as diverse at higher latitudes.

The Odonata and their ancestors are some of the most ancient of insects. They have many primitive features, but also possess many specializations that reflect their aerial and predatory lifestyle. In North America, the Odonata includes two suborders -- the Zygoptera (damselflies), the Anisoptera (true dragonflies). Damselflies are slimmer, often smaller, and usually fly more slowly than dragonflies. At rest their equal-sized wings are usually held together above the body (the spreadwings are an exception). Zygoptera means “joined wings”. Dragonflies are mostly robust and often fast-flying, with the hindwings broader than the forewings. Anisoptera means “unequal wings”. When perched they hold their wings out away from the body.

The aquatic larvae are predacious, eating small aquatic insects, crustaceans and even fish. Larvae can be placed in three categories according to their body structure and feeding behaviour. *Claspers* (damselflies and darners) are active, streamlined stalkers that grasp the stems and leaves of submerged vegetation, climbing among the plants in search of prey. *Sprawlers* (cruisers, emeralds and skimmers) lie in ambush on the bottom mud, debris and underwater plants. *Burrowers* (clubtails and spiketails) normally live in streams and cover themselves with sand and mud and await their prey. Larvae moult 10 to 15 times as they grow. When fully grown, the transformed adult, still inside the larval

skin, crawls out of the water up a plant stalk or some other support. The skin on its back splits open and the adult dragonfly squeezes out. The newly emerged dragonfly pumps blood into the wings, expanding them. Gradually the body hardens, and after an hour or so the dragonfly can fly. It leaves the empty larval skin (exuvia) clinging to the plant. Adult dragonflies take a week or two to mature. As young ones fly and hunt for food, their colours darken and intensify – yellows may turn to reds, pale greys to blues. Some adults develop a whitish bloom (called pruinescence) on their bodies as they mature.

Adults are aerial, visually oriented predators with large eyes, strong chewing mandibles and spiny legs. Their prey is mostly a wide range of flying insects, which are usually captured with the legs in flight.

Mature males patrol the breeding habitats, aggressively searching for mates, and may, like birds, defend a territory against other males of the species. When a male finds a mate, he grasps her by the front of the thorax (damselflies) or by the top of the head (dragonflies) with the appendages at the tip of the abdomen. The female loops the end of her abdomen up to the base of the male's abdomen where the sperm is stored and transferred. The Odonata are the only insects that mate in this "wheel position."

The female lays the eggs once they are fertilized. All damselflies and some dragonflies (mainly the darners) have a knifelike egg-laying structure called an ovipositor, at the tip of the abdomen. They lay their eggs in plant tissue of various sorts. Competition for mates is usually fierce, and male aggression can prevent females from laying their eggs. Females laying eggs alone are usually secretive. In many species, the male often retains his hold on the female while she lays her eggs, guarding her from other males who may attempt to mate with her. Species lacking ovipositors usually just dip the tip of the abdomen into the water and wash the eggs off, and the eggs sink to the bottom.

Damselflies and many true dragonflies, develop rapidly and, for many British Columbia species, the life cycle takes about a year. Spreadwings and some meadowhawk species that live in ponds that dry up in late summer, overwinter as eggs, hatch in the spring and emerge as adults in the summer. Most species overwinter as larvae and emerge the following spring or summer, although probably in some species under certain conditions, the larvae overwinter two years. However, in the larger dragonflies, such as the darners or emeralds, the short summers of high altitudes in the region often mean that four or five years are spent in the larval stage. Adult dragonflies in British Columbia live about one to two months.

Spencer's Pond is an excellent place to watch dragonflies. The warm water and rich aquatic vegetation attracts many species. Because the pond often dries up in summer, several species are adapted to temporary summer water. One of these, the Red-veined Meadowhawk, is a specialty of Spencer's Pond – it is more common here than in most other southern Vancouver island locations (see more information on it below). For identifying some of the dragonflies and damselflies that you see, try using my book *Introducing the Dragonflies of British Columbia and the Yukon* (Royal B.C. Museum, 2002) (damselflies are included) or the pictures on this or other websites (eg. The Royal

BC Museum's entomology site at
http://www.royalbcmuseum.bc.ca/Natural_History/Insects-and-Relatives.aspx).

Some Dragonfly and Damselfly species of Spencer's Pond

Damselflies (Suborder Zygoptera)

Spreadwings (Family Lestidae)

Spreadwings are large damselflies, brown, black, metallic-green or bronze above. When perching, they hold their wings out at an angle from the body. As they age, parts of the body, including the tip of the abdomen in males, often become white or grey. Females lay eggs in tandem with males, usually in plants above the surface of the water. Some species are adapted to temporary ponds where the larvae grow rapidly after the eggs overwinter. All BC species belong to the genus *Lestes*.

Common Spreadwing (*Lestes disjunctus*)

The mature male has blue stripes on top of its thorax, but the thorax turns grey with age; the mature male's eyes are dark above and pale blue below. The male's lower appendages are long and straight; on the inner edge of each upper appendage there is a long tooth at the base and another just past the midpoint. The end of the female's ovipositor does not reach the tip of the abdomen. In most places, Common Spreadwing adults emerge after the first Emerald Spreadwings but before most Spotted Spreadwings. Flies from mid June to mid October.

Emerald Spreadwing (*Lestes dryas*)

The top of the thorax is metallic green. The male's lower appendages are foot-shaped. The end of the female's ovipositor reaches the tip of the abdomen. Usually the first spreadwing to emerge in the year. Flies from late May to mid September.

Spotted Spreadwing (*Lestes congener*)

Prominent dark spots on the pale underside of the thorax, which contrasts with dark brown or black upper surface. The top of the thorax has narrow pale stripes. The male's lower appendages are at most half as long as the upper ones. It emerges later than other species of spreadwings and is the last damselfly seen in autumn. Flies from early June to early November (unusual before mid July).

Pond Damsels (Family Coenagrionidae)

Pond damsels are small damselflies that normally perch with wings closed above the abdomen. Most are blue marked with black, but the main colour may be green, yellow, orange, red or purple. There are often two female colour forms, one of which is similar to the male (usually blue). Females lay eggs in the tissues of water plants, sometimes completely submerging themselves for considerable periods while depositing eggs. The bluets (*Enallagma*) and forktails (*Ischnura*) are the most common groups.

Bluets (*Enallagma*)

These species are hard to distinguish without examining them closely. Females can be especially tricky: they are blue, green or brown; on most, the base of the abdominal segments is pale and the tips black; and all have a small spine in front of the ovipositor. Males are mostly sky blue with black stripes on the thorax and black rings around the abdominal segments; their appendages offer the best identification clues.

Boreal Bluet (*Enallagma boreale*)

The male's upper appendages are shorter than the lower ones and, when viewed from above, have a pale tubercle on the inner margin. The rear half of the female's segment 8 is black, and a pale area at the base is sometimes divided by a black line. Flies from late April to mid October.

Northern Bluet (*Enallagma annexum*)

The male's upper appendages are shorter than the lower ones and they bear pale tubercles at the tip, visible from above. The rear half of the female's segment 8 is usually black on top with the pointed end of this black band dividing a pale area at the base. The most common damselfly on southern Vancouver Island; adults usually emerge a week or two after those of its close relative, the Boreal Bluet. Flies from early May to late October. Formerly called *E. cyathigerum*.

Forktails (*Ischnura*)

Male forktails are mostly black, blue and green. The abdomen is black above and has a blue tip; the last segment bears a distinct forked projection on top, which gives the group its English name. Females may be the same colour as males or may have a tan, pink or orange thorax when immature; they may darken with extensive pruinescence as they age.

Pacific Forktail (*Ischnura cervula*)

The sides of the male's thorax are blue, changing to green below; the top is black, with two pairs of pale dots. The female's thorax is rarely coloured like the male's, but more often blue or tan to pink, and striped with black; the abdomen has a blue tip. Most females become dark with age. This is probably the most common damselfly around Victoria. It has one of the longest flight seasons of any dragonfly in BC, and is usually the first to appear in spring. Flies from early April to late October.

Western Forktail (*Ischnura perparva*)

Our smallest forktail; the male's thorax is green on the sides, and dark with green stripes on top. Immature female's thorax and base of abdomen are orange, usually black on top of the other segments. Mature female has the pale areas on her body darken to olive, and the top of the abdomen is all black; but eventually, the whole body becomes covered by grey-white pruinescence. Common, but usually less common than the Pacific Forktail. The stocky little females lay eggs alone, their grey bodies and green eyes making them easy to identify. Flies from early May to early October.

True Dragonflies (Suborder Anisoptera)

Darners (Family Aeshnidae)

Darners are large, swift-flying dragonflies usually marked with blue, green or yellow. Adults hunt tirelessly for insects over ponds, lakes and streams, and wander widely in search of prey. Most species rest in a vertical position on shrubs and trees. Females have a prominent ovipositor and lay eggs in water plants or floating wood above or below the water line.

Mosaic Darners (*Aeshna*)

Mosaic Darners are common dragonflies in the Victoria area. Generally, the large body is brown, and each side of the thorax has a pair of blue, green or yellow stripes – their shape is important in identification. The abdominal spots on males are usually blue, and on females green, yellow or blue.

Paddle-tailed Darner (*Aeshna palmata*)

This darner's face is greenish yellow with a black line; the rear of the head is black. The thorax stripes are almost straight. The abdomen has pale spots on top of segment 10, but none underneath on any segments. The male's stripes are yellow below and green to blue above, and its abdominal spots are blue. The female can be coloured like the male, but most have green-yellow thorax stripes and abdominal spots. Male appendages are flattened and paddle-like, with a tiny spine at the tip. One of the most frequently encountered and abundant dragonflies in the region; flies from mid May (usually late June) to early November.

Neotropical Darners (*Rhionaeschna*)

Similar to *Aeshna*, but recently separated as a distinct genus; both sexes have a tubercle on the underside of the first abdominal segment. Species of *Rhionaeschna* in BC have pale areas all blue in males and the lateral thoracic stripes are straight. Both species have southern and western affinities, unlike most of our darners, which are northern and transcontinental.

Blue-eyed Darner (*Rhionaeschna multicolor*)

This darner's thorax stripes are straight; its face line, if it has one, is thin and pale brown. The male's face and eyes are sky-blue; the thorax stripes and abdomen spots are blue; the upper appendages are forked strongly in side view. The female has either blue or yellow thorax stripes and abdomen spots. Common in midsummer; flies from mid May to mid October.

California Darner (*Rhionaeschna californica*)

The thorax stripes of this small darner are straight and bordered with black. The eyes are blue and the face is pale blue with a black line. The male's thorax stripes are pale blue; its upper appendages are simple. The female has pale blue or yellow thorax stripes and abdomen spots. For a darner, remarkable for its springtime flight season. It may appear in April, with the earliest dragonflies; by early August it is uncommon, just when many darners are reaching their peak abundance. Flies from mid April to mid August.

Emeralds (Family Corduliidae)

Emeralds are medium-sized dragonflies most often seen around lakes, boggy streams and peatlands in the mountains or in the north. The eyes, often brilliant green, meet broadly on top of the head. Adults seldom perch during feeding and males frequently hover when patrolling for mates; when resting, they hang vertically or obliquely from vegetation.

Mountain Emerald (*Somatochlora semicircularis*)

The sides of the Mountain Emerald's thorax are shiny metallic green with two oval yellow spots, the larger in front. The abdomen is slender and dark, but the sides sometimes have small, dull yellow spots on segments 5 to 8. Viewed from above, the upper appendages are strongly pincer-like; the shape of the appendages gives this species its scientific name, *semicircularis*. This is the most common *Somatochlora* in BC but it is rare at Spencer's Pond. Flies from late May to early October.

Skimmers (Family Libellulidae)

The skimmers come in many sizes and colours, many with bold wing markings or coloured veins. Their eyes meet broadly on top of the head. Most common around ponds, marshy lakeshores and sluggish streams, the adults dart about and most species spend a lot of time perched horizontally in the sun. Females lay eggs alone or in the company of guarding males. Most dip the tip of their abdomen into the water when releasing the eggs.

Blue Dasher (*Pachydiplax*)

Pachydiplax is a North American genus containing a single species.

Blue Dasher (*Pachydiplax longipennis*)

The Blue Dasher is a small to medium-sized skimmer. Its thorax is striped with yellow and brown, and the base of the hindwing has an orange patch with two dark-brown streaks. Females and young males have brown eyes and a dark brown abdomen with two interrupted yellow stripes on the top. Mature males have a white face and green eyes; the abdomen is thickly coated with pale blue pruinescence, but the thorax is usually just thinly pruinose. Males hover frequently and defend territories aggressively; both sexes defend feeding perches. They perch, with wings cocked downward, on stems and twigs from near the ground to high in trees. Flies from early June to mid September.

Whitefaces (*Leucorrhinia*)

Whitefaces are small, black dragonflies with white faces. The thorax and abdomen are usually marked in males with red, in females with yellow (or sometimes red). The hindwings have a distinctive small, triangular dark patch at the base and the legs are black. Most are most often found at higher elevations around Victoria, at marshy lakes in late spring and early summer. The Dot-tailed Whiteface is different, preferring cattail

marshes and ponds in the warm valley bottom. Whitefaces perch on the ground, logs, lily pads or low vegetation. Males usually hover nearby while females lay eggs. The species can be tricky to separate; look for the colour pattern on the abdomen.

Dot-tailed Whiteface (*Leucorrhinia intacta*)

This species features a distinctive yellow spot – actually, a pair of dots – on segment 7 of its abdomen. On mature males, this spot stands out against the dark body, as does the white face. Immature males, many mature females and very few mature males have yellow on other segments. Likes to sit on waterlily leaves; flies from early May to late August.

King Skimmers (*Libellula*)

Most King Skimmers have banded or spotted wings, and in some species, the males sport abdomens covered with white or bluish pruinescence. Showy and aggressive, king skimmers can be found perching, hovering and skimming over the waters of ponds, lakeshores and sluggish rivers. During egg laying, a female taps the water with the end of her abdomen; she flies alone or is guarded by her mate hovering nearby.

Eight-spotted Skimmer (*Libellula forensis*)

Each of this skimmer's four wings has two large dark patches; mature males and some females have white patches between the dark ones and near the wing tips, which are clear. Mature males have a thin coating of blue-grey pruinescence on the abdomen and front of the thorax. Flies from early May to late October.

Four-spotted Skimmer (*Libellula quadrimaculata*)

This skimmer is grey-brown to yellow-brown, except for the black end of the abdomen. Each wing bears a small dark spot at the midpoint of the front edge, and the hindwings have a dark triangular patch at the base. A golden stripe on the front edge of each wing can be prominent or vague. One of the earliest dragonflies in the spring; flies from late April to early October.

Meadowhawks (*Sympetrum*)

Meadowhawks are small to medium-sized dragonflies that are mostly yellow when young and mostly red when mature; one common species is black. Females are usually yellow or tan, but can be red like males. Usually, you can observe adults easily at close range, because most species are not powerful fliers and perch often. Many species often perch on the ground.

Red-veined Meadowhawk (*Sympetrum madidum*)

Immatures are grey-brown but males and some females become red, darkening to wine-red with age. The sides of the thorax bear a pair of white stripes that shrink to spots in mature males. The wing veins are yellow, turning red with age; old specimens have brown-tinted wing membranes. The legs are black. Females lay eggs in water or on the

beds of dry pools. Flies from late May to late September but most records are from early June to late August.

Spencer Pond has the distinction of being the place from which the larva of the Red-veined Meadowhawk was first described (Cannings 1980, 1981). It was first found there in 1979. That year, fully grown larvae were collected on 16 June and densities were estimated at 20 larvae per square metre. Adults were first seen emerging that year in small numbers from 18 to 21 June and a few adults about a week old were seen. A single exuvia found on 3 June indicates that emergence began in the first week of the month. The major emergence occurred on the morning of 23 June when about 10 larvae per square metre emerged on aquatic plants. A few mature mating adults were also seen that day. About half the population emerged that day and by 30 June all the population was adult.

Striped Meadowhawk (*Sympetrum pallipes*)

This meadowhawk has a yellow or yellow-white face and a pair of yellow-white stripes on the sides of the thorax and usually a smaller pair on top of the thorax. Young adults have a yellow to yellow-brown body that becomes red, especially on the abdomen, as males and some females mature. There are saw-toothed black stripes on the sides of the abdomen. Flies from early June to early November.

References

- Cannings, R.A. 1980. Ecological notes on *Sympetrum madidum* (Hagen) in British Columbia, Canada (Anisoptera: Libellulidae). *Notulae odonatologicae* 1(6): 97-99.
- Cannings, R.A. 1981. The larva of *Sympetrum madidum* (Hagen) (Odonata: Libellulidae). *Pan-Pacific Entomologist* 57(2): 341-346.
- Cannings, R.A. 2002. *Introducing the Dragonflies of British Columbia and the Yukon*. Royal British Columbia Museum, Victoria, B.C. 96 pp.

LIST OF THE DRAGONFLIES (ODONATA) OF SPENCER'S POND (2007)

Twenty-three species are recorded from Spencer's Pond and are represented as specimens in the Royal BC Museum collection. The additional ones highlighted in blue are expected breeding or visiting species. There may even be others!

SUBORDER ZYGOPTERA (DAMSELFLIES)

FAMILY LESTIDAE (SPREADWINGS)

Emerald Spreadwing (*Lestes dryas* Kirby)

Lyre-tipped Spreadwing (*Lestes unguiculatus* Hagen)

Northern Spreadwing (*Lestes disjunctus* Selys)

Spotted Spreadwing (*Lestes congener* Hagen)

FAMILY COENAGRIONIDAE (POND DAMSELS)

Western Red Damsel (*Amphiagrion abbreviatum* (Selys))

Boreal Bluet (*Enallagma boreale* Selys)

Northern Bluet (*Enallagma annexum* (Hagen))

Pacific Forktail (*Ischnura cervula* Selys)

Swift Forktail (*Ischnura erratica* Calvert)

Western Forktail (*Ischnura perparva* Selys)

SUBORDER ANISOPTERA (DRAGONFLIES)

FAMILY AESHNIDAE (DARNERS)

Lake Darner (*Aeshna eremita* Scudder)

Paddle-tailed Darner (*Aeshna palmata* Hagen)

Shadow Darner (*Aeshna umbrosa* Walker)

Variable Darner (*Aeshna interrupta* Walker)

Green Darner (*Anax junius* (Drury))

Blue-eyed Darner (*Rhionaeschna multicolor* (Hagen))

California Darner (*Rhionaeschna californica* (Calvert))

FAMILY CORDULIIDAE (EMERALDS)

American Emerald (*Cordulia shurtleffii* Scudder)

Spiny Baskettail (*Epiheca spinigera* (Selys))

Mountain Emerald (*Somatochlora semicircularis* (Selys))

FAMILY LIBELLULIDAE (SKIMMERS)

Western Pondhawk (*Erythemis collocata* (Hagen))

Crimson-ringed Whiteface (*Leucorrhinia glacialis* Hagen)

Hudsonian Whiteface (*Leucorrhinia hudsonica* (Selys))

Dot-tailed Whiteface (*Leucorrhinia intacta* (Hagen))

Belted Whiteface (*Leucorrhinia proxima* Calvert)

Eight-spotted Skimmer (*Libellula forensis* Hagen)

Four-spotted Skimmer (*Libellula quadrimaculata* Linnaeus)

Blue Dasher (*Pachydiplax longipennis* (Burmeister))

Common Whitetail (*Plathemis lydia* (Drury))

Variegated Meadowhawk (*Sympetrum corruptum* (Hagen))

Saffron-winged Meadowhawk (*Sympetrum costiferum* (Hagen))

Cardinal Meadowhawk (*Sympetrum illotum* (Hagen))

Red-veined Meadowhawk (*Sympetrum madidum* (Hagen))

White-faced Meadowhawk (*Sympetrum obtrusum* (Hagen))

Striped Meadowhawk (*Sympetrum pallipes* (Hagen))

Autumn Meadowhawk (*Sympetrum vicinum* (Hagen))

Black Saddlebags (*Tramea lacerata* Hagen)