



# RİCE

## A Natural History

Life Cycle: Odonata lay eggs, which hatch

to become nymphs. Most odonata live more than a year, and most of this time is spent as nymphs, underwater. To become adult dragonflies, nymphs grow wings and get rid of their gills. Adult odonata live during the summer, mainly in temperate climates

### Interaction with the

Environment: Odonata are usually

found near freshwater lakes, ponds, and sill water in streams. An ecosystem is usually in good condition if odanata are present, as pollution has a great effect on odonata.

## **Eating Habits:**

Odonata are carnivores, and eat ants, mayflies, caddisflies, gnats, mosquitos, tadpoles, butterflies, and many other insects.

## **Mating Habits:**

There is much competition between males in mating. Where the females lay their eggs depends much on the acidity of the water, as well as the abundance and kind of vegetation, temperature, and flow rate of the water.

#### **Predators:**

The main predators of odonata include frogs, birds, lizards, spiders, fish, water bugs, and even other odonata.

#### **Bodies:**

Odonata have large eyes, short antennae, six legs used for perching or catching food, long abdomens, and two pairs of wings. Odonata can fly up to 30 miles per hour and rely heavily on their sense of sight, hence the large eyes.

## **Ode to Odonata**

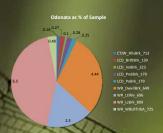
## An Examination of the Odonata Population in Vermont Streams

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Research on Adaptation to Climate Change (RACC) 2013-2014

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Stream Site	Percent of	
	Sample	
CTJW_HllsBrk_713	0.18	
CTJW_SBrnchWR_797	***	
LCC_MetRv_742		
LCD_BrtltBrk_139	0.27	
LCD_IndBrk_323	0.10	
LCD_PndBrk_179	0.28	
LCD_PoBrk_179	0.25	
WR_DwvllBrk_649	4.44	
WR_GoldBrk_952		
WR_LtlRiv_696	2.5	
WR_LzBrk_809	0.48	
WR_WBLRTribA_725	0.15	



Odonata Population in

1	39.4	■ Zygoptera Coenagrionidae			, e
border	Family	Common Name	% in Streams Database		F
soptera	Cordulegastridae	Spiketails	18.2		
	Aeshnidae	Darners	39.4		
		Skimmere/		Name and Address of	

## Vermont Streams Question:

What is the distribution and diversity of Orde Odonata in Vermont Streams?

## Methods:

- Identify which streams were being investigated by the 2013 – 2014 RACC High School Teams
- Download all current and historic data for those streams
- Analyze data for members of Odonata

## **Analysis:**

Of 21 streams that were investigated in the past year, 12 were found to have macroinvertebrate data at the time the data analysis took place. Of these, 9 reported having some members of Odonata.

Odonata ranged from 0.10 – 6.50 % of the collective samples. While Odonata comprised a small sample of the reported population, Dragonflies and Damselflies are commonly seen hunting along the streams during the summer sampling season.

Four families of Dragonflies (Suborder Zygoptera) and one family of Damselfly (Suborder Anisoptera) were represented in the RACC database. Four streams had only one family, and 4 streams had 2 families. Only one stream had all four families (Potash Brook).

### Conclusion:

Since Odonata are seen commonly on streams in the summer in Vermont, it was expected that there would be larger percentages in the database. However, since the members tend to lay their eggs in shallow water on the margins of streams, it makes sense that the kick samples, primarily collected in riffles, would have fewer Odonata larvae.

# Difference between Dragonflies and Damselflies

- Tolerance: Dragonflies are more sensitive to pollution and cold weather than damselflies are.
- Mating: Damselflies mate while perched, while dragonflies mate while flying.
- Morphological: Dragonflies have larger abdomen, and their back wings are slightly larger than the front pair. Their wings are also larger over all which enables them to fly faster.
   Damselflies tend to be more slender, and have smaller wings, with both pairs the same size and shape.
- Perching: Damselflies fold their wings when they perch, while Dragonflies leave their wings unfolded.

#### References

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## **Evolutionary History**

The oldest recognizable Odonata fossils are from the group Protodonata, and are approximately 325 million years old. The fossils, found in Upper Carboniferous sediments in Europe, show insects that were built for speed, had spiny legs for capturing prey, and had wingspans of up 75 centimeters. This group went extinct in the Triassic period, which happens to be when dinosaurs started appearing. Other fossilized ancestors of Odonata include Protoanisoptera, which were also found in Carboniferous layers. They also had huge wingspans compared to today's insects--fifty to seventy centimeters--and they did not have the wing notches and other wing features that modern Odonata have.

Since about 250 million years ago, Odonata have not changed much in structure and shape, but one significant development has been aquatic larvae. Many researchers believe that Protodonata and other ancestors of modern Odonata did not have aquatic larvae, because no fossils of such larvae appear before the Mesozoic era. Therefore, it is believed that Odonata evolved to have an

Therefore, it is believed that Odonata evolved to have ar aquatic larval stage because much of their prey lived in aquatic habitats.

Whatever the specifics of the evolution of Odonata, only three members of this ancient group still exist today: Anisoptera (Dragonflies), Zygoptera (Damselflies), and Anisozygoptera.

