Resources for the study of the Odonata in Canada

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Introduction

When I began studying the Odonata in the early 1970s, only six or seven people across Canada shared my interest. Since then, and especially during the last decade, dozens and dozens of enthusiasts have taken up the challenge of studying and watching dragonflies. Biologists research the ecology, behaviour, biogeography and phylogeny of these endlessly fascinating insects; conservationists study the status and abundance of populations; naturalists watch and record the comings and goings of adults and larvae. The popularity of dragonfly study is on the rise. New and useful books and internet sites have multiplied. This brief report lists only the most important of these resources for the study of the Odonata in Canada.

The English term “dragonflies” here refers to the whole order Odonata, which, in Canada, includes the suborders Zygoptera (damsel-flies) and Anisoptera (dragonflies proper).

There are two international odonatological societies that publish journals and newsletters; belonging to one or both of these organizations brings the student into contact with the international odonatological community and the benefits that this conveys:


Perhaps even more useful is membership in the Dragonfly Society of the Americas, with its Bulletin of American Odonatology and newsletter, Argia, where all sorts of information on Odonata, publications and regional field meetings is published. See http://www.afn.org/~iori/dsaintro.html. Also invaluable is a connection to the international Odonata list-serve where e-mail discussions on innumerable dragonfly topics occur. Information on joining this discussion group can be found at http://orion.ups.edu/mailman/listinfo/odonata-1.

Basic Literature


(A superb and comprehensive treatment of the biology of Odonata worldwide by the dean of odonatologists.)

Amphiagrion abbreviatum female. The genus Amphiagrion contains two recognized species, one eastern, one western. A. abbreviatum is the western species. There is some uncertainty over species limits in the genus; taxonomic studies are still needed to solve many questions in the Odonata.

Photo: Rob Cannings, Royal BC Museum
(Colour photos and descriptions of many Canadian species; good general treatment of Odonata biology and study.)

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(Useful field guide to all North American Anisoptera; diagnostic field information, photos and distribution maps; useful for putting Canadian species in the continental context.)

(A small British book with an excellent summary of the biology of Odonata.)

(The most up-to-date treatment for the identification of all Nearctic Anisoptera; heavy on description, light on distribution, biology and ecology.)

(An excellent treatment of the subject for the beginner.)

(A colourful and wide-ranging overview of the biology and systematics of the world’s Odonata.)

(Out of date but a classic treatment of a large and important Canadian genus.)

(Out of date but a classic treatment of a large and important Canadian genus.)

(Contains introduction and Zygoptera. This and the following two volumes comprise the classic treatment of Canadian species – identification, description, distribution and biology. Although out of date, they are still indispensable for Canadian work.)

(Contains the non-libelluloid Anisoptera.)

(Contains the libelluloid Anisoptera.)

(Companion to Needham et al. above; the most up-to-date treatment for the identification of all Nearctic Zygoptera; heavy on description, light on distribution, biology and ecology.)

Argia vivida male. An uncommon damselfly of the western mountains, this species inhabits the pools and streams associated with springs, especially warm ones. Hot springs are frequently developed for bathing, and Argia vivida habitat is threatened in several localities. Dragonflies are the subject of many species at risk studies. Photo: George Doerksen, Royal BC Museum.
Basic Regional Literature

Yukon:


(Field guide with colour photos; general distribution of Yukon species put in context of the Cordillera as a whole.)


(Yukon fauna in a biogeographical light.)


(Detailed distribution, including maps for each species.)

British Columbia:


(Field guide with colour photos; general distribution of BC species put in context of Cordillera as a whole.)


(Somewhat out of date with respect to distribution and status, but useful still; detailed descriptions and identification keys to adults and larvae.)


(Early treatment of western odonatology by the master.)


(Classic biological writing of strong historical interest.)

Alberta:

John Acorn has a manuscript on the damselflies of Alberta that is awaiting publication. Look for it before long, we hope!


Manitoba:


Ontario:


(Effective little guide to the Odonata of the richly diverse southwestern corner of Ontario.)

(Distributional maps of E.M. Walker’s extensive damselfly records)


(Extremely useful compendium of information on Ontario Odonata and its study, including distribution maps, habitat preferences and status of the 168 species recorded to 1999.)


(Ontario Odonata publishes observations and the results of dragonfly projects throughout the province. The three issues noted here, along with future ones, are invaluable aids to the study of dragonflies in Ontario).


(A fine booklet on some of the odonate fauna of this famous northern park).

(Quebec:


Two journals provide much information on Quebec odonatology:


Atlantic Provinces:


Nearby United States:

Carpenter, V. 1991. Dragonflies and damselflies of Cape Cod. Cape Cod Museum of Natural History, Natural History Series No. 4. 79 pp.


(Guide to the adult Anisoptera of Indiana, with colour photographs and distribution maps.)
Larva of *Aeshna interrupta*. Studies on the detailed habitat requirements of larvae are high on the list of the most needed odonatological research.

Photo: Rob Cannings, Royal BC Museum


Literature relating to faunas of particular habitats


Some Catalogues and Lists


Internet

**General Internet Sites**

There is a huge amount of information available on the Internet. The best site to locate most of this is: Oregon Dragonfly and Damselfly Survey


(The site is invaluable — it gives links to more odonatological sites than any other single web page. Use this site to search for any topic. A few other useful sites are listed below in various categories. Note this is only a small selection.)

International Odonata Research Institute.

http://www.afn.org/~iori/

(The site of the International Odonata Research Institute, Gainesville, FL. A comprehensive compendium of news, events, information requests, e-mail directories, books, odonatological supplies and links to many other sites.)
Tillyard, R.J. 1917. The biology of dragonflies. 

*This Cambridge University Press classic is still essential reading for serious students. A preliminary web version is at http://www.jcu.edu.au/school/tbiol/zooology/auxillry/odonata/tillyar1.htm*

Regional Sites

British Columbia:


Cannings, Robert A. The Blue Darners: dragonflies of the genus Aeshna in British Columbia.

http://www.royalbcmuseum.bc.ca/nh_papers/aeshna.html

Ontario:


http://www.wincom.net/~prairie/odonata.html

Ojibway Nature Centre, Windsor. Damselflies and dragonflies of the Ojibway Prairie complex.

http://www.ojibway.ca/odonata.htm

(Paul Pratt's fine outline of the Odonata of this rich site in SW Ontario.)


On the Internet at http://www.ncf.carleton.ca/~bf250/odonata.html

Atlantic Provinces:

Nova Scotia

Dragonflies of Nova Scotia, by Paul-Michael Brunelle


http://lakes.chebucto.org/ZOOBENTH/BENTHOS/iv.html

EMAN Ecozones


On Internet at http://www.naturewatch.ca/Mixedwood/odonata/intro.html
Nearby United States

Alaska
http://www.ups.edu/biology/museum/AlaskaOD.html (species list)

http://www.ups.edu/biology/museum/AKdragonkey.html (field key)

California
http://www.sonic.net/dragonfly/

Idaho
http://imnh.isu.edu/digitalatlas/bio/insects/insefr.htm

Illinois
http://www.museum.state.il.us/research/entomology/od_db.html

http://www.museum.state.il.us/research/entomology/od_outofstate.html

Maine
http://MDDS.umf.maine.edu/~odonata/index.html

Massachusetts
http://www.odenews.net

(Odenews is an excellent newsletter (also available in paper) about Odonata in southern New England. The site also has links to other important material.)

Michigan
http://groups.yahoo.com/group/gl_odonata

(Sharing information on the Odonata of the Great Lakes region; sponsored by the Michigan Odonata Survey.)


http://insects.ummz.lsa.umich.edu/fauna/MIODONAT.HTML (A Checklist of Odonata found in Michigan.)

Minnesota
http://www.chaparraltree.com/mn/dragonflies.shtml

Ohio
http://www.ohiododonata.com/

http://mcnet.marietta.edu/~odonata/ (The Ohio Odonata Society)

Oregon
http://www.ent.orst.edu/ore_dfly/

Washington
http://www.ups.edu/biology/museum/WashOD.html

Bibliography
http://www.windsofkansas.com/odbib.html

Conservation
Check the web sites of the various provincial Conservation Data Centres or Natural Heritage Information Centres. Go to these via the home page at http://www.natureserve.org/visitLocal/index.jsp. Provinces post conservation ranking lists. Some Centres, such as Alberta, Manitoba, Ontario and the Atlantic Provinces, have databases for Odonata records (see Collections and Databases below).

Ideas on how to build and maintain dragonfly ponds and other habitats are found at

http://www.dragonflysoc.org.uk/mhd4.htm

and

http://www.dragonflysoc.org.uk/dap3.htm

Collecting and preserving
Equipment and supplies

http://insects.ummz.lsa.umich.edu/entostuff.html
Collecting and preservation techniques
http://www.afn.org/~iori/morse2.html
http://www.ups.edu/biology/museum/ODcollecting.html

Collecting policy
http://www.afn.org/~iori/oincolgl.html

Distribution
There are many sources of distributional information. Check with provincial Natural Heritage Information Centres (Conservation Data Centres) and museums.

http://www.ups.edu/biology/museum/westernOD.html

Distribution of North American Zygoptera by state and province.
http://www.afn.org/~iori/zyglist.html
(Based on Westfall and May (1996) with additions linked to sources.)

Distribution of North American Anisoptera by state and province.
http://www.afn.org/~iori/nalist.html
(Based on Needham, Westfall and May (2000) with additions linked to sources.)

Dragonflies and damselflies (Odonata) of the United States. United States Geological Survey, Northern Prairie Wildlife Research Center.
(US distribution maps, but not complete or current.)

Glossary
http://www.ups.edu/biology/museum/ODglossary.html

Images
Photographs and scanned images are everywhere on the Internet; here are a few:
http://www.ups.edu/biology/museum/WAODDphotos.html
(Live scans of western North American species.)
http://www.ups.edu/biology/museum/ODphotos.html

http://www.sonic.net/dragonfly/
http://www.odenews.net/images.htm

List-serves and discussion groups
http://www.afn.org/~iori/oinforum.html

Phylogeny
http://www.bechly.de/phylosys.htm

Societies and People
http://www.afn.org/~iori/oinemail.html
(Email addresses of odonatologists by country.)

Species Lists
http://www.ups.edu/biology/museum/NAdragons.html
(North American list with common names sponsored by Dragonfly Society of the Americas.)
(R. Garrison. New World list.)
http://www.ups.edu/biology/museum/worldodonates.html
(Schorr, M., M. Lindeboom and D.R. Paulson. List of Odonata of the world.)
http://www.afn.org/~iori/oinlist.html
(Links to many lists – world species, continents, regional.)

Collections and Databases
Specimen collections are valuable for confirming identifications and occurrence data and for supplying material for systematic studies. Some collections have their material databased. The main Canadian collections containing Odonata are listed below. Private collections are not included. The main databases residing outside collections are also included.

British Columbia:
Royal British Columbia Museum, 675 Belleville Street, Victoria, BC V8W 9W2.
Spencer Entomological Museum, Department of Zoology, University of BC, Vancouver, BC V6T 1Z4.

**Alberta:**
Strickland Entomological Museum, Department of Biological Sciences, University of Alberta, Edmonton, AB T6G 2E3.

Alberta Natural History Information Centre, 2nd Floor, Oxbridge Place, 9820-106 Street, Edmonton, Alberta T5K 2J6 (database of species considered to be of conservation concern).

**Saskatchewan:**
Royal Saskatchewan Museum, Wascana Park, Regina, SK S4P 3A2

**Manitoba:**
Entomology Department, University of Manitoba, Winnipeg, MB R3T 2N2.

Manitoba Conservation Data Centre, Box 24, 200 Saulteaux Crescent, Winnipeg, MB R3J 3W3 (database)

**Ontario:**
Canadian National Collection of Insects, Agriculture and Agri-food Canada, Ottawa, ON K1A 0C6

Department of Entomology, Royal Ontario Museum, 100 Queen’s Park, Toronto, ON M5S 2C6.

Department of Environmental Biology, University of Guelph, Guelph, ON N1G 2W1.

Natural Heritage Information Centre, Ontario Ministry of Natural Resources, Box 7000, 300 Water St., Peterborough, ON K9J 8M5.

Department of Zoology Collection, University of Western Ontario, London, ON N6A 5B7

Algonquin Provincial Park Visitor Centre, Ontario Ministry of Natural Resources, Box 219, Whitney, ON K0J 2M0

The Ontario Odonata database is housed and maintained at the Natural Heritage Information Centre (Ontario Ministry of Natural Resources, Box 7000, 300 Water St., Peterborough, ON K9J 8M5). It currently contains over 35,000 georeferenced records. It is not a fully public database. Access is currently limited to major contributors and partners, as well as on a project-to-project, need-to-know basis for conservation related work.

**Quebec:**
Département des sciences biologiques, Université de Montréal, CP 6128, Succ. A, Montréal, QC H3C 3J7.

Natural History Museum, Bishop’s University, Lennoxville, QC J1M 1Z7.

**Prince Edward Island:**
The largest PEI collection is in the New Brunswick Museum (see below).

**New Brunswick:**
New Brunswick Museum, 277 Douglas Ave, St. John, NB E2K 2E5.

**Nova Scotia:**
Nova Scotia Museum, 1747 Summer St., Halifax, NS B3H 3J5.

**Newfoundland and Labrador:**
Biology Department, Memorial University of Newfoundland, St. John’s NF A1C 5S7.

**Atlantic Provinces Database:**
The Atlantic Dragonfly Inventory Program (ADIP) database currently holds more than 16,000 records from the Atlantic Provinces and an additional 25,000 records from northern New England (principally Maine). Contact Paul-Michael Brunelle, 6044-1 Compton Ave., Halifax NS B3K 1E7.

The Atlantic Canada Conservation Data Centre (17 Waterfowl Lane, PO Box 6227 Sackville, NB, E4L 1G6) holds all data from the Atlantic Provinces as of 2001.

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**Sympetrum pallipes**, mating pair. Behavioural research on the Odonata is popular. Photo: George Doerksen, Royal BC Museum