

THE  
BRODIE  
CLUB



ROYAL ONTARIO  
MUSEUM OF ZOOLOGY

### THE 1,056th MEETING OF THE BRODIE CLUB

The 1,056th meeting of the Brodie Club was held at 7:30 pm on Tuesday, April 17, 2012 in Room 432 of the Ramsay Wright Zoological Laboratories of the University of Toronto.

Chair: George Bryant  
Secretary: Kevin Seymour

The meeting was attended by 33; 29 members and 4 guests.

#### **Roll Call:**

**Present:** E. Addison, R. Addison, Beadle, J. Bendell, Y. Bendell, Bertin, Bodsworth, Boswell, Bousfield, Bryant, Coady, Currie, Eadie, A. Falls, B. Falls, J. Hussell, Iron, Larsen, Lumsden, Machin, McAndrews, Pittaway, Reading, J. Rising, T. Rising, Seymour, Speakman, Tasker, Tomlinson.

**Regrets:** Abraham, Crins, Curry, Dunn, Gray, D. Hussell, Norm Martin, Norma Martin, Slessor, Strickland, Sutherland.

**Guests:** Sid Daniels, guest of G. Bryant; David Dunham, guest of T. Rising; Sharon Hick, guest of J. McAndrews; and Brian Shuter, guest of R. Addison

**Minutes:** The following correction for the minutes of meeting 1055 was received:

The spelling of Hugh Currie's guest should read Jenn, rather than Jen Sinasac.

With this correction, the minutes of the March meeting were accepted.

#### **Announcements and New Business:**

- Program Committee  
B. Falls reported that the May meeting will be held on Tuesday May 1; **two weeks** before the usual "third Tuesday of the month". The speaker will be club member Erica (Ricky) Dunn. Ricky's presentation is titled "Citizen Science and the Study of Natural History".
- Membership Committee  
Ann Falls reported that Norma and Norm Martin are transferring to Corresponding Membership. The Martins enjoy keeping in touch with the Brodie Club.

- Rose Addison informed members that the Toronto Zoo would be extending an invitation to Brodie Club members to the opening of the white tiger exhibit at the Zoo. The date for the event is Thursday, May 10.
- Claire Muller would like to suggest the Kingston area for a future field trip. This lead to a motion by B. Falls that a standing committee be formed for the organization of field trips. Motion seconded by Lumsden. Motion carried. No one volunteered however. **If you are interested, please let Rose know!**

### **SPEAKER:**



The speaker for the evening was **Erling Holm**, Assistant Curator in Ichthyology at the Royal Ontario Museum, with the topic of “Fishes of Toronto”. He was introduced by B. Falls. Here is some of the text of Bruce’s introduction. You will note names of several former Brodie Club members mentioned.

“As a teenager I went to the ROM to visit **Jim Baillie**. One day I met **Professor Dymond** who asked me to help him catch fish on a trip he was leading for the Toronto Field Naturalists. I was hooked. As a University student I worked on stream surveys where **Fred Ide** taught me to identify fish using a key. It is always exciting to learn a new group of organisms and the little minnows were like warblers to me.

Later, when I was teaching ecology at U of T I wanted my students to appreciate different communities in different habitats. What better example than the fishes in the pools and rapids of Duffins Creek. For years **Murray Speirs** and I took bus loads of students there. If I found a fish I couldn’t identify I took it to the expert at the ROM, **Bev Scott**. All my fish mentors were members of the Brodie Club.

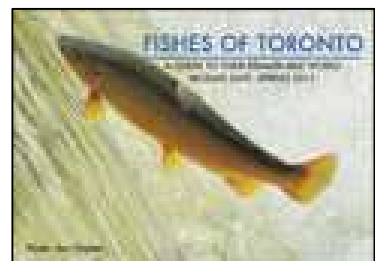
One year we had a bright student with a Danish accent – Erling Holm. I don’t know if our trips to Duffins Creek influenced him but he spent his summers on stream surveys for MNR. This led to him joining the ichthyology and Herpetology staff.

Erling now is assistant curator and collections manager, a very responsible position. Among his duties he has conducted collecting trips to South America. He is now the authority on the identification of Ontario fishes. He conducts fish identification workshops, produced a variety of guides and is senior author of the excellent and attractive ROM Field Guide to the Freshwater Fishes of Ontario. He is also involved in conservation with COSEWIC, writing many status reports and serving on recovery teams.....”

### **Fishes of Toronto**

Erling began by referring to the City of Toronto Biodiversity Series of booklets. Birds of Toronto was published in 2010 and Butterflies of Toronto in September, 2011. The third in the series is the recently published Fishes of Toronto and Erling made copies available to all in attendance.

In the booklet, all Toronto fish species have at least two lines of text and a photo, whereas selected species have larger accounts due to their importance or interest. The publication also includes an extended discussion on habitat restoration in the Toronto area.



In 1615 Étienne Brûlé became the first white man to arrive in the Toronto area. By 1793, the era of settlement had started. By 1800, there was still little development, the creeks were clear, and one could see 18 feet down in Lake Ontario due to the clear water. Atlantic Salmon, Lake Sturgeon and Whitefish were common. In the waters of the bay between the

islands and the shoreline, pike, muskellunge, perch, basses, sunfish and walleye were present. Offshore in rocky areas, lake trout and whitefish spawned.

Between 1850 and 1910 there were many changes to fish habitat. The rocky spawning areas were destroyed by ‘stonehooking’ (removal of rocks for use elsewhere), weeds were removed, Ashbridge’s Bay was filled in, much of the shoreline was paved or stabilized with concrete, and water courses were channelized. By 1860, 90 mills and their associated dams had been built on the Humber River, and by 1864 there were 50 mills on the Don. The water in the dammed areas became warmer, and discharges from mills polluted the rivers.

Urbanization has caused the biggest changes to the water courses in the city, with many of these watercourses being buried, or made into concrete channels. Riparian vegetation at their edges has often been removed, causing increased siltation and turbidity, as well as flash floods, which in turn widen some areas while filling in others. However, there are still some good fish habitats remaining: ponds (e.g. High Park), creeks (e.g. Highland Creek), wetlands (e.g. Rouge River marsh) and open Lake Ontario.

Habitat restoration is having an effect. Pike, bass and walleye are starting to return in numbers. A number of dams have been removed or notched to allow for fish migration up streams.

Today, 67 native fish species remain in the Toronto area, and together with another 15 or so introduced or recently invaded species, 82 different fish species can be found. As far as we know, only ten species have been extirpated.

Erling showed underwater photos and discussed some of the fish species living in Toronto streams and creeks. Because of a technical glitch we were unable to view several videos Erling had made of nest building, parallel swimming, and spawning behaviour.

### Fishes of Streams and Creeks

**Longnose Dace** is persistent, living in riffles. It has a high tolerance for increased temperatures and the lowering of oxygen levels.

**White Sucker** start out in streams and later in life move to the open lake. They can be seen in Sheridan Creek in Mississauga.

**Rainbow Darter** lives on the bottom. The male is probably Toronto’s most colourful fish.

**Creek Chub** male has nuptial tubercles on its head during the breeding season. It butts heads with other males in combat.

**Common Shiner** engages in parallel swimming during the breeding season and squeezes the eggs out of the females, who are relatively smaller.

The **Redside Dace** was formerly widespread but is now endangered. In the Toronto area it occurs only in Morningside Creek (it is found in some streams north of the city). Relative to its size, the Redside Dace has the largest mouth of any Canadian minnow. It prefers pools, where its diet is restricted to aerial insects, which it often catches by “leaping” out of the water. It often uses nests made by the ‘workhorse’ creek chub.



### Fishes of Lake Ontario

The fishes living in the lake have suffered overfishing, nearby urbanization and the introduction of invasive species.

The *Atlantic Salmon* is the (un)official fish of Toronto. This species lays its eggs upstream in creeks in the fall, and the eggs overwinter. After hatching in the spring, the young develop through successive growth stages: first alevin, then fry, parr, and smolt. The silvery smolts migrate to the open lake where they grow to maturity. They complete the cycle by returning to the upstream areas to spawn.

The stocks of Atlantic Salmon were declining by 1840. Samuel Wilmot started the first hatchery for this species in 1866, and the population briefly picked up in the late 1870s, but finally crashed in the 1890s.

Atlantic Salmon and Lake Trout feed on several species of ciscoes, and the crash of these species, overfishing and the decline of water quality no doubt contributed to the decline of these larger predators. The ROM has five stuffed specimens from the 1880s, the last collected in 1898. DNA was extracted from them in order to find out where in the world the stocks are most genetically similar. The answer turns out to be a landlocked population in Maine. Reintroduction efforts by Ontario began in 2006.

*American Eel* was once common, and was a staple food of the natives. It lives in freshwater and returns to the Sargasso Sea to breed. The young eel, called leptocephalus, drifts with plankton. When it matures to a glass eel it migrates up rivers, including the St. Lawrence. The Ontario population has crashed although there are signs of a small recovery in recent years.

*Lake Sturgeon* was common between 1840 and 1860. It was harvested for its roe and also for its flesh which was smoked. Although remaining populations are small, there are signs of recovery in Lake Ontario and also the St. Clair River.

*Alewife* is one of the most abundant species in Toronto waters today. It was first recorded in 1835, probably moving into Ontario via the Erie Canal. It is possible it was native, as there is some archaeological evidence of this species from Burlington Bay, but perhaps it was through trading of foods by natives.

*Salmonids*. Although some introductions had occurred earlier, New York State started introducing various Pacific salmon in 1969 in a big way and Ontario has followed suit. Each year about two million (primarily Chinook) are stocked along with about half a million of Rainbow Trout, Brown Trout and Coho Salmon. These feed on the introduced Alewife and Rainbow Smelt and provide angling opportunities. Recently Atlantic Salmon and Lake Trout (both formerly native species) have been re-introduced.

### Invasive species

Many species have invaded Lake Ontario but not all have become established.

*Common Carp* was first introduced in Lake Ontario in the 1870s, for fishing opportunities, food and for controlling aquatic vegetation. Now they are a nuisance in wetlands, as they stir up the bottom during spawning and this suffocates the eggs of nearby breeding native fish species. Millions of dollars are now spent trying to exclude them from wetlands.

*Sea Lamprey* were originally thought to be invasive. Recent genetic work has suggested they have unique haplotypes and so may have been native. They moved into the upper Great Lakes via the Welland Canal. Presently a chemical control is used to kill the larvae, or barrier dams are installed to prevent spawning in order to keep their numbers in check.

**Rainbow Smelt** was introduced in the Finger Lakes of New York and spread to Lake Ontario in 1931. It has now declined, but this species is included in the diet of the larger salmonids.

**White Perch** invaded Lake Ontario in 1948, has been moving steadily through the Great Lakes and was found in Lake Superior in 2003.

**Zebra and Quagga Mussels** invaded in 1988 via ballast water of ocean-going ships from Europe. Their filter-feeding habit has resulted in clearer lake water, but mussels attach to boats and build up in water intake pipes.

**Round Goby** was introduced to the St. Clair River via ballast water in 1998. In 2005 it was estimated there were 10 billion of them in western Lake Erie alone. They feed on the zebra mussels, which is advantageous, but they harbour botulism, which kills fish-eating birds that consume them.

#### QUESTIONS:

*Bertin: This is really a comment about how big the biomass of fish in Toronto waters must be. The cormorant population has grown to 4000 and it is thought each bird consumes 100 fish/ day.*

*Q. B. Falls: Are there any common sunfishes in Toronto waters?*

A. Yes, there are Pumpkin seed, several other sunfishes, and Largemouth Bass.

*Q. Reading: Are there fresh water drum? We used to see a lot in the 1940s.*

A. Yes, they are still found.

*Q. Eadie: I've noticed that there has been some work to encourage fish spawning at the little park at the end of Spadina.*

A. Yes, it is hoped that Northern Pike might use that area but I don't know about the success.

*Eadie: I have seen a Northern Pike there.*

*Bertin: I've seen pike at bottom of Bathurst St.*

Yes, the RAP habitat improvement has encouraged spawning... including spawning of walleye in the Don River.

*Q. T. Rising: Why did we have the reduction of the smelt in the 60s?*

A. They were a food for the introduced salmonids.

*Q. Hick: A number of years ago I remember seeing a huge salmon that washed ashore at Woodbine Beach.*

A. Yes, they die after they have spawned.

*How many years would it take to get to that large size?*

They are fast growing so not too many. Because they are fast growing they are relatively clean so are good eating.

*Q. Bendell: How would you grade the health of Toronto streams? Is there something fundamental in the way the lake has changed to cause the ups and downs of fish populations; is it bottom up or top down?*

A. It seems the lake is pretty good; fishermen say the fish are good and clean. The streams are better...the MNR has been working to get rid of, or notch dams to allow fish migration.

*Which do you think is the driving force of the change of populations... the production of the lake or predation?*

In the case of the salmonids, their increase was due to on the availability of smelt and alewife, and as the food diminished, so did the salmonids.

*Q. Speakman: Do you expect salmon to become self sustaining?*

A. They are known to be spawning but not likely in high enough numbers to support a self-sustaining population. Millions are stocked every year.

*Q. Bodsworth: Lake Erie is warmer than Lake Ontario. Has that resulted in any different populations? I remember seeing gar... strange fish with a long beak in Erie.*

A. Yes, there is a higher diversity in Lake Erie. The Long Nose Gar and Spotted Gar are both warm water fishes.

*Q. Bertin: In the 1970s fish would have three or four lamprey scars. What has caused the decrease?*

A. The Sea Lamprey control centre uses the chemical lampricide TFN in the Credit River to try to control Sea Lamprey.

*Q. Sid Daniels: Colour change in the male Rainbow Darter, what controls this?*

A. Apparently it is water temperature and not photo-period. They can live in a 10 gallon tank.

*A comment was made that the American Eel seems to be having a natural resurgence in Europe. In NA, they are being transported over dams, as the dams block the natural migration.*

The speaker was thanked by Oliver Bertin.

## **NOTES & OBSERVATIONS**

*Reading:* The Cabonga reservoir south of Val-d'Or in La Verendrye Park in Quebec is almost dry.

*Bendell:* "Report from Ottawa:" Ottawa is also in a drought situation, due in part to record high temperatures and low snowfall this past winter. Wild Turkeys are of concern as their numbers are increasing incredibly; they outnumbered Canada Geese on the Christmas Bird Count. Goldfinch and siskin numbers seem to be on the increase. A pair of Pileated Woodpeckers is nest-building on the Bendell's property.

*J. Hussell:* Long Point had an egg in a Robin nest on March 26; the previous earliest Ontario Nest Record Scheme date for Ontario was April 4!

*Lumsden:* earliest year for Canada Goose nesting: first eggs on March 23.

*Sid Daniels:* more early records no doubt following the seven unseasonably warm days in March: Leopard frogs calling on March 23 at Long Point, skink in Gravenhurst area on March 24, along with a freshly emerged Gray Hairstreak butterfly at the Torrance Barrens on 23 March.

*Larsen:* has discovered that some lichens photosynthesize while submersed in water. This was not supposed to occur.

*Currie and Eadie:* migrant Red Admirals have been recorded in unprecedented numbers (thousands across Ontario), due to the recent warm southerly flow of air.

*Bryant:* Edward G. Voss's three volume Michigan Flora was republished in Feb. 2012 as The Field Manual of Michigan Flora, single volume without illustrations by Voss and Tony Reznicek. As well, George observed a killdeer nest with four eggs last week.

The meeting was adjourned at 9:30 pm.

### CORRESPONDENCE



describes two additional finds of "unique" hominid skeletal remains, at Longlin in Guangxi and at Maludong in Yunnan, caves from which these materials were excavated in 1979 and 1989 but have since lain dormant in museum basement vaults! More remains have also been found at the recent site I mentioned at that same meeting.

What else may lie "unrediscovered" in other museum vaults? It does make one wonder, does it not?

In another area of interest to me I have been pondering questions of the evolutionary antiquity of certain minute aquatic crustaceans, of their worldwidespread distribution but obvious close relatedness still.

In the case I illustrate herewith, that of a cladoceran Genus, *Ilyocryptus*, it must go back to Gondwana at least. What I find remarkable is the apparent stability of body form over such a vast time period in these specialized but minute crustaceans.

Must there not be different "time-lines" guiding rates of evolutionary change in different life forms?

I keep pondering evolution - and wonder what critical pieces of the puzzle are escaping our notice and comprehension? We pursue it down the size scale into the molecular but something bigger than that seems to me to be missing from our logic. I wonder what it will turn out to be?

Kasta,

Ken.  


This letter and the illustrations on the following pages were sent to the Brodie Club secretary by Ken Reading to be circulated to all members.

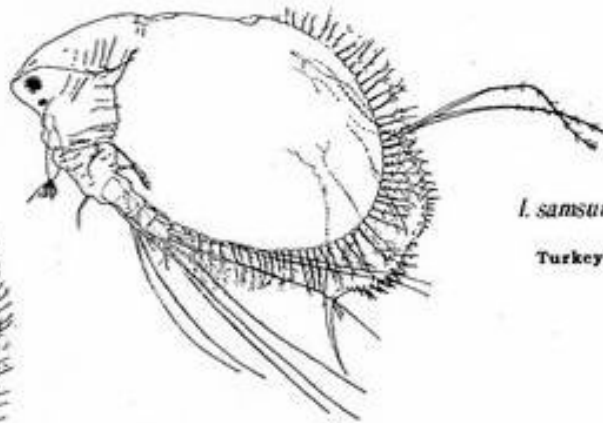
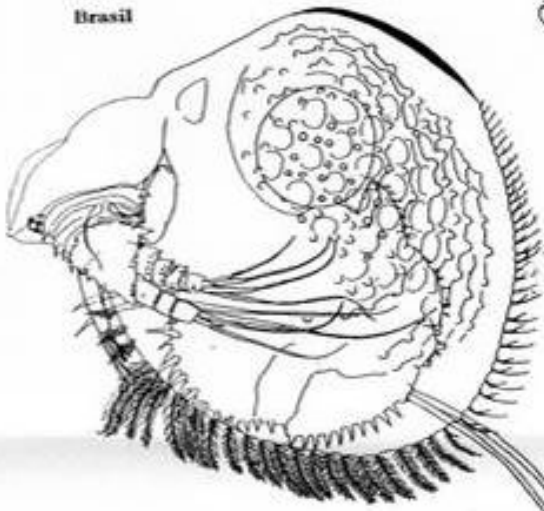
### NEXT MEETING

The next meeting will be held Tues., May 1 at 7:30 pm in Room 432 of the Ramsay Wright Zoological Laboratories. The speaker will be club member, **Erica (Ricky) Dunn**. Ricky will speak on "Citizen Science and the Study of Natural History".



*Ilyocypris sarsi*

Brasil



*I. samsuni*

Turkey

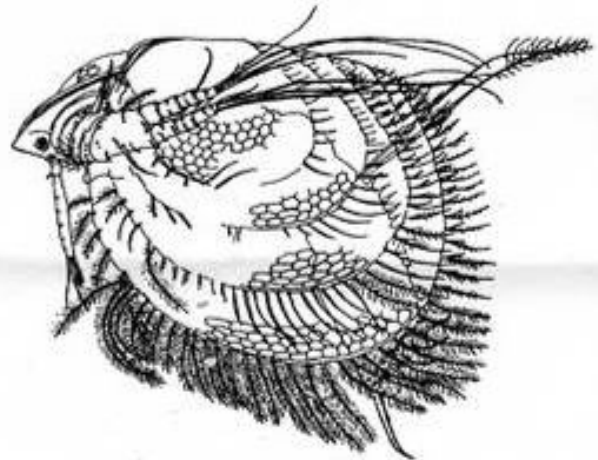
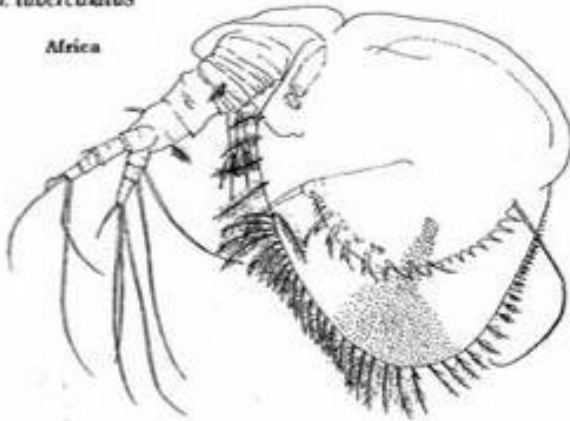
*I. nevadensis*

Mexico



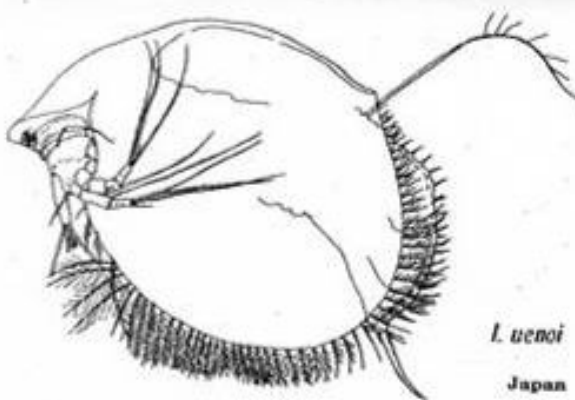
*I. tuberculatus*

Africa



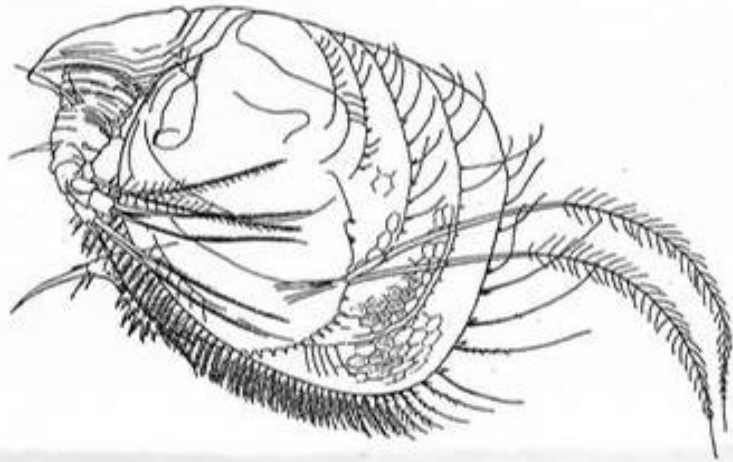
*I. spinifer*

N. America



*I. uenoi*

Japan

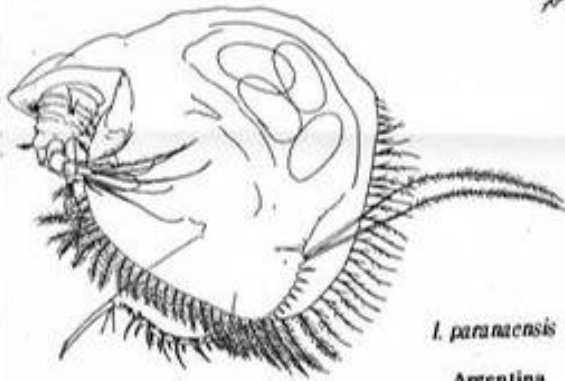
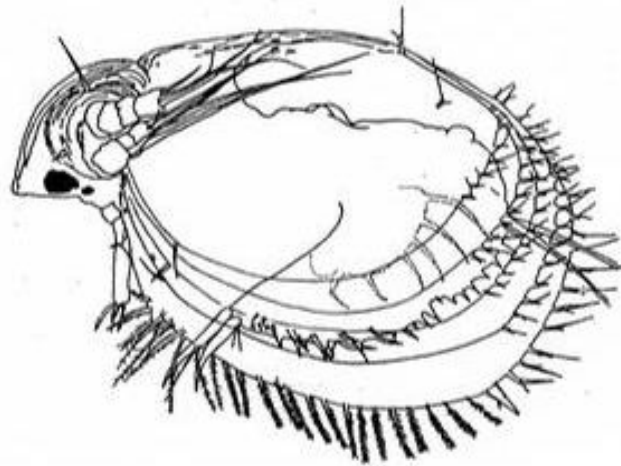


*Iyocryptus smirnovi*

Australia

*I. anatolicus*

Turkey



*I. paranaensis*

Argentina