THE BRODIE CLUB

Established 1921

Website: http://thebrodieclub.eeb.utoronto.ca

THE 1,109th MEETING OF THE BRODIE CLUB

The 1,109th meeting of the Brodie Club was held on Tuesday, 20 March, 2018 in Room 432 of the Ramsay Wright Laboratories of the University of Toronto.

Chair: Kevin Seymour
Secretary: Ed Addison

The meeting was called to order at 7:34 pm and was attended by 38; 31 members and 7 guests.

Roll Call:

Present: E. Addison, Bell, Bertin, Carley, Crins, Currie, Daniels, DeMarco, Dengler, Dunn, A. Falls, B. Falls, Hussell, Iron, King, Kortright, Kotanen, Lindsay, Lumsden, Machin, Martyn, McAndrews, Moldowan, Muller, Obbard, Pittaway, Reading, Riley, Seymour, Thomas, Tomlinson.

Guests: Ron Dengler and James Eckenwalder (guest of Nancy Dengler), John Bacher (E. Addison), Graham Duggan (Moldowan), Dierdre Tomlinson and Rae Hutchinson (David Tomlinson), Sharon Hick (McAndrews)

Regrets: Abraham, R. Addison, Beadle, Bryant, Curry, Dunlop, Eadie, Johnson, A. Juhola, H. Juhola, LaForest, Larsen, Martin, Rapley, Rising, Slessor, Sutherland.

Minutes: Approved as presented (Crins/Obbard).

Committee Reports:

Program Committee: Ed Addison will speak in April on "Ecology of Parasitism: A Naturalist's Hike Through the Ontario Underworld" and Anne Bell will speak at the May meeting on "Madagascar". It was confirmed by Dunn that the club previously decided that the May meeting would remain on the third Tuesday, May 15.

New Business:

The recent passings of long time Brodie Club members Jim Rising and Yvonne Bendell were acknowledged and cards were available for members to sign. The club is sending flowers both to Trudy Rising and Jim Bendell.

Patrick Moldowan spoke about the Algonquin Wildlife Research Station (AWRS) in Algonquin Park. Since establishment in 1944, over 800 peer-reviewed publications on a diversity of biological disciplines have arisen from research at the AWRS. The AWRS is a fertile training ground for young ecologists and conservationists with 500-600 undergraduate students visiting the facility and about 20 graduate students conducting thesis research annually. The AWRS is seeking donations of equipment and funds for ongoing support. You can learn more about the AWRS by calling the Executive Director at 705-633-5621 or visiting http://algonquinwrs.ca. An equipment 'wish list' will be distributed to members, and pick-up of large items can be arranged.

SPEAKER: Dr. David Beresford, an entomologist from Trent Universi ty was intruced by Obbard. After an undergraduate degree at Trent and a education degree, Dr. Beresford pursued work outside science before returning to complete his doctoral studies at Trent. He spoke to the club on "Biting Flies North and South."

There were two distinct sections to the talk: one on the biology and control of stable flies, a pest of agricultural concern in southern Ontario, and the second part on censuses for biting flies in the Hudson Bay Lowlands and other parts of northern Ontario.

Stable flies (*Stomoxys calcitrans*) tear a wound from which to mop up flesh and blood, unlike mosquitoes that pierce and suck up their food. Female stable flies bite five times before they begin laying eggs and males bite three times before achieving sexual maturity. Stable flies are most active at warm summer temperatures and do not even fly at temperatures below 1˚C. Thus, it is in July and August when stable flies are the greatest of agricultural pests. Commercial traps for stable flies are available but expensive so Beresford and colleagues developed their own very inexpensive traps. Distribution of flies from traps clearly demonstrated that many stable flies could be trapped at 5cm above ground and few at 95 cm. Similarly, many more could be trapped in short grass and fewer in tall grass – all consistent consistent with stable flies biting low on the legs of their prey. Peak numbers are trapped at a height of 25 cm above the ground, and it's important to know this for population monitoring.

Mobility of flies is related to their age. A greater proportion of immature males will fly upwind and the converse for mature males. The older flies will have had numerous previous meals and do not need to be so aggressive in seeking out hosts upon which to feed. Slightly more than 50% of adult females will survive to feed once and another 50% of adult females disappear before achieving second feeding. The bigger the fly, the more eggs she can lay.

Dispersal of stable flies is influenced by many factors, one of which is infestation with mites (*Macrocheles muscaedomestica*). Flies with mites were more common close to the livestock and unlike mite-free flies, were never caught along roads in traps mounted on the top of a moving vehicle. Flies that have mites do not fly far! The mites serve as a form of biological control because once the stable fly is laying eggs the mites will detach from the fly and eat the eggs that have just been laid.

The question arises as to whether stable flies are carried into farms during the spring on winds from warmer climate zones or if there are refugia that allow flies to overwinter throughout Ontario farm country despite temperatures below 1˚C being lethal. If there are local refugia flies should arrive at progressively further north climate zones as warming temperatures progress along a N-S gradient. In contrast, if blown in by winds, the flies should arrive across climatic zones more or less at the same time. By studying spring appearance of stable flies across three narrow climatic zones between Lake Ontario and Peterborough, Beresford and colleagues determined that there must be overwintering refugia.

Traps to reduce the stable fly populations on farms can be very effective when optimal trap sites are used (low to the ground) and because the traps do not attract and trap pollinating bees. 96% of trapped females are nulliparous so the traps effectively eliminate a proportion of the populations before they ever bite livestock. Inexpensive traps can reduce the biting stable fly population by 1/3, which is enough to reduce it below the threshold for causing economic losses for the farmer. Even if the population exceeds that threshold, trapping can delay that point into August, at least reducing the period of economic damage before the end of the stable fly season.

Beresford's survey work in northen Ontario was conducted at latitudes north of the south end of James Bay from the east to the west sides of the province. He recorded many new range extensions for insect species, as well as numerous first records for Ontario and in at least one class for Nunavut (Akimiski Island in James Bay). First records for Ontario included two species of mosquitoes and the tabanid, *Hybomitra osburni*. There were also three previously unrecorded species of Dystiscidae, diving water beetles, with one of the newly recorded beetles being as large as a mouse!

QUESTIONS

Why are horseflies around us so quickly upon our arrival at a site (Kotanen)? When arriving by helicopter part of the attraction is the high CO_2 produced by the aircraft, as biting flies are attracted to hosts by following gradients of increasing CO_2 gradients. However, under other circumstances the speed of arrival is due to tabanids being more visual hunters than mosquitoes or blackflies. They have large efficient eyes and key into animal movement.

How do stable flies affect economic losses (Martyn)? The stable flies agitate the livestock sufficiently when biting. When most abundant and active (by mid-July) there can be a measurable cost to the farmer in reduced milk production. The cattle will stomp and move around a lot reducing energy available for production.

What are interesting ecological notes on the stable flies (John Bacher)? Stable flies carry the mites that reduce survival of egges; there are many different types of habitat that will influence the degree to which different species of hosts may be a source of a bloodmeal; stable flies/tabanids and other flies are pollinators. An interesting ecological effect of tabanids is that when caribou are heavily targeted, they will remain still and not move around.

Do fish eat tabanids/stable flies (John Bacher)? No; these are highly terrestrial insects not readily available to fish.

Can you extract DNA from bloodmeals to determine the hosts upon which flies have fed (Hussell)? I do not, but some people do use that technique.

What are these flies doing on flowers that makes them pollinators (Dunn)? These flies (and many others such as mosquitoes) feed on nectar to maintain the energy levels needed to seek out hosts for bloodmeals.

If a fixed number of traps reduces the stable fly population by 1/3, how many traps would be required to reduce the population further (Daniels)? That is not clearly understood.

Is there progress on reducing local over-wintering refugia for stable flies (Hussell)? Sites sufficiently warm to be succesful winter refugia include poorly cleaned livestock barns kept at temperatures above freezing. Straw that is not changed daily can create maintain temperatures

above freezing beneath cattle that are lying down. Areas below water bowls, if not cleaned regularly, support survival of maggots. Also the advent of the labour efficient large round bales for hay/straw have created much overwintering habitat, because the bales provide sufficient insulation such that the ground beneath them does not freeze.

OBSERVATIONS

E. Addison noted that the Brodie Club copy of "A Pocketful of Galls … William Brodie and the Natural History Society of Toronto" written Louise Hertzberg is available for club members wishing to learn more about the Ontario naturalist after whom the club was named.

Tomlinson reported an osprey in Aurora in mid-February, the earliest observation he has recorded in his many years of maintaining records.

J. Bacher noted a 25' deep sink hole cave in the Niagara area, used by the Toronto Caving Society.

The meeting was adjourned at 8:45.

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