THE BRODIE CLUB

Established 1921

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

THE 1,126th MEETING OF THE BRODIE CLUB

The 1,126th meeting of the Brodie Club was held on Tuesday, 18 February, 2020 in Room 432 of the Ramsay Wright Laboratories of the University of Toronto.

Chair: Ross Harris
Secretary: Ricky Dunn

The meeting was called to order at 7:34 pm and was attended by 28; 22 members and 6 guests.

Roll Call:

Present: E. Addison, R. Addison, Bacher, Beadle, Bell, Bertin, Crins, Currie, Daniels, DeMarco, Dunlop, Dunn, Eckenwalder, Harris, Hussell, Hutchinson, Juhola, Kortright, Kotanen, Martyn, Stones, Thomas,

Guests: Mary-Lou Bacher (guest of Bacher), Rachel Gottesman (Kortright), Samera Sukumar (Bell), Ron Jenkins (Bertin, Clara Thaysen and Alex Caouette (guests of the Club).

Regrets: Abraham, Bryant, Eadie, Lindsay, McAndrews, Miller, Moldowan, Obbard, Peter, Riley, Rising, Seymour, Tomlinson.

Minutes: Accepted with submitted amendments.

Committee Reports:

The next meeting will be on Tuesday, 17 March. Our own Jim Eckenwalder will be speaking on 'Conifers: familiarity, stereotypes and beyond.'

The speaker in April will be Bill McIlveen: 'Small place – special place: Interactions of physical characters, human culture and natural biology within the Regional Municipality of Halton.'

Ed Addison can't continue doing as much for the Program Committee as he has been. Please volunteer to assist in issuing invitations and making arrangements with speakers, and/or to serve as an occasional host to a speaker at the Faculty Club prior to the meeting. Several volunteers for each task would lighten the load for all.

SPEAKER

Ed Addison introduced the speaker, Josh Feltham. Originally from Iceland, Josh attended University of Toronto, then worked at a reptile zoo for 10 years before joining the teaching staff at Fleming College (formerly Sandford Fleming). He is now a student there as well, finishing a Ph.D. on the subject of tonight's talk.

Five-lined Skinks: Life at the Edge

The Five-lined Skinks (*Plestiodon fasciatus*) is Ontario's only native lizard. Though broadly distributed in the eastern U.S., the range barely makes it into Canada. There are a few small, isolated populations scattered around Great Lakes shores of southwestern Ontario, where they are found in habitat similar to that in the U.S., generally in moist woodland clearings. The main population in Ontario, however, occupies patches of exposed flat rock within woodland areas of the southern Shield, in a band extending from the eastern shores of Georgian Bay to Gananoque.

These skinks are sexually dimorphic; the heads of males are larger and develop a red blush during the breeding season. Immatures of both sexes have bright yellow stripes and a blue tail, but as the animals age these colours fade to browner tones.

The aim of Feltham's study is to determine whether skinks at the extreme edge of their range adhere to several broad biogeographic trends, or 'break the rules' in order to survive in an outpost. The expected trends he investigated are these:

1) The extent of northern range is limited by abiotic factors rather than habitat availability.
2) Body size increases with latitude (Bergmann's Rule); and if so, degree of sexual dimorphism also increases (Rensch's Rule).
3) Greater clustering of individuals (more likely at range edge where dispersal opportunities are low) leads to higher rates of polygyny

The first question was investigated by documenting habitat and abiotic factors. Temperature and habitat characteristics were measured where non-basking skinks were found (mainly under rocks), as well as in randomly-selected other locations. Comparison of the two data sets showed that skinks preferentially selected steeper slopes, and those that faced southeastward. Temperatures where skinks were found reached levels optimal for skink activity (20-25°C) earlier in the day than did air temperatures. Habitat and food resources are both abundant further north, and the data suggest that abiotic conditions suitable for this cold-blooded reptile are the likely factor limiting northern extent.

The next question required capturing and measuring individuals. Anyone who has lifted a rock with a skink under it will know it can race to nearby cover in the blink of an eye. Feltham showed a lovely video clip that illustrated the trick for capture. Empty VCR cassettes are arranged around a candidate rock, openings facing inward, the rock is lifted, and the disturbed skink dashes into one of the cassette openings. Captured skinks are then put into zip-lock plastic bags, where they can be kept still while measurements are being taken.

Measurements demonstrated that head size of both sexes increases with body length as the skinks grow. Comparable data from a population in South Carolina showed a similar pattern, but the Ontario skinks were larger; as expected by Bergmann's Rule. Feltham also found evidence that the

gap between measurements of males and females were larger in Ontario than in South Carolina, as per Rensch's Rule.

The last question investigated the relationship between clumped distribution of individuals and mating system. Skinks do not become sexually mature until about 3 years old, and typically live only to 5 or 6, so mate competition might be expected to be high. Individuals in Feltham's population rarely moved more than 15 m (though sometimes as much as 100 m). This was first studied by examining distance moved between captures of the same individual (which can be identified by markings on their scales), a method that was later proved to give the same results as tracking individuals marked with pit-tags so they could be tracked electronically without disturbing the skinks from their hiding places.

Spacing of individuals was clearly clustered, with more individuals using places with the more preferred abiotic features (temperature and slope). Genetic study showed that both sexes mate with multiple partners, so there is certainly a high degree of polygyny in this population. Unfortunately, there are no comparable data on mating system or clustering patterns from a southern population (or along an altitudinal gradient), so it remains to be discovered whether rate of polygyny is higher at the edges of range distribution.

Climate change will alter the abiotic limits of skink range, so we might expect range expansion into areas of more closed canopy, similar to habitat used by southern populations. When developing plans to protect endangered species, our tendency is to preserve the habitat they are using now, but the skinks of the Shield may have expanded opportunities as the climate warms and, correspondingly, no need for protection of bare rock openings in the forest. The lesson is relevant to study of all endangered species: learn the biological needs across the whole range, especially where the species is abundant; not just in the area of endangerment.

Questions following the presentation elicited additional information.

- As far as Feltham knows, there are no skink populations farther north, and his study area really is at the northern limit of the range. In cooler regions, vegetation mats grow over the bare rock areas that provide the warm microhabitat skinks need. And even if there are suitable but disjunct sites nearby, the limited dispersal capacity of skinks may prevent range expansion.
- High density of skinks near the limits of range is probably not a key factor for range expansion.
- Skinks overwinter by hibernating below the frost line. If they freeze, they die.
- The Shield rocks where skinks occur are granite or gneiss – no limestone.
- Rates of predation are unlikely to vary geographically. There are lots of skink predators in every region.

Bill Crins thanked the speaker.

OBSERVATIONS

Dunn and others noted that birds have begun singing – Cardinals, House Finch, chickadees. Sandhill Cranes are still in Port Rowan area.

Ed Addison reiterated his recommendation of David Quamman's "The Tangled Tree." Click here for New York Times review.

John Bacher is reviewing the autobiography of a former Ontario Chief of Forestry, Ken Armson ("Into the Woods: My Life in Forestry").

Syd Daniels, who has kept records of chipmunk activity in winter, recorded one this year running around at -4°C.

Josh Feltham has seen Merlin near his home in Kawarthas and asked if that was expected in winter. Response was yes, that's happening quite regularly.

Bacher noted a coyote howling near his home, and Bertin has heard them in Mt. Pleasant Cemetery.

Warren Dunlop saw a black bear in Algonquin Park (i.e., not hibernating), and also reported a male Red-winged Blackbird that has been using a feeder there most of the winter.

Jeremy Hussell reported sightings from Long Point Bay earlier this day. About 10,000 ducks had been pushed close to shore by ice, about half each of Canvasbacks and Redheads. Pipits were regularly flying northward in ones and twos.

Spring is on its way!

The meeting was adjourned at 9:05 p.m.

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