

DIRECTED READINGS 890-3 (Fall 2011 - 1117)

Altruism in structured landscapes

Professor: Dr. B. Roitberg

Student: Joe Biology

This directed readings course will examine the impact of spatial structure on interactions among individuals, in particular altruistic interactions. Hamilton's theory for altruism was developed for well-mixed populations yet we know that populations can be fragmented and poorly mixed. First, we will look at the general theory of altruism and then read papers that both theoretically and experimentally consider local interactions. This course will provide a firm foundation for developing a graduate research program on interactions within and among aphid clones regarding response to natural enemies. The plan is to read original research papers, reviews and book chapters on a weekly basis. We will address theoretical issues, experimental designs and analytical methods. On average, each week, one to three papers will be read. Each week, the student will be required to provide a short written synthesis of the readings (1-3 pages) prior to the meetings. The papers will then be discussed each meeting, scheduled for Monday of each week for 1- 1.5 hours (11:00 am). At the end of the semester the student will write a research proposal for studying altruism in aphids. A grade will be assigned based upon evaluation of that paper and the weekly submissions. Fifty per cent of the grade will be based upon weekly submissions and discussion and the other 50% will come from the semester's-end paper.

Some of the papers that we will read include:

Alexander, R.D. (1974) The evolution of social behaviour. *A*
, 5, 325-383.

J. C. Perry & B. D. Roitberg 2005 Games among cannibals: competition to cannibalize and parent-offspring conflict lead to increased sibling cannibalism. *J. EVOL. B IOL.* 18 (2005) 1523–1533

Hamilton, W.D. 1964. The genetical evolution of social behaviour. I, II. *J. Theor. Biol.* 7: 1–52.

Godfray, H.C.J. & Parker, G.A. 1992. Sibling competition, parent-offspring conflict and clutch size. *Anim. Behav.* 43: 473–490.

Sjerps, M. and Haccou, P. 1995. A war of attrition on the same host-plant –