RECENT PUBLICATIONS

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Spring 2007

Journal Articles

Gosse, J. W., and Hearn, B.J. 2005. Seasonal diets of Newfoundland marten, *Martes americana atrata*. *Canadian Field Naturalist* **119**: 43–47.

We analyzed scats (*n* = 679) and stomach contents (*n* = 25) collected from 1980–2003 to assess the relative frequencies of food types utilized by Newfoundland Marten (*Martes americana atrata*) during summer and winter. Meadow Voles (*Microtus pennsylvanicus*) were the most prevalent food item occurring in 80% and 47.5% of samples from summer and winter, respectively. Apart from Snowshoe Hares (*Lepus americana*), which occurred in 28% of winter samples, all other food types occurred in <16% of samples during each season. Diet breadth was widest during winter and may be related to a lower availability of Meadow Voles during this time of year.

Major, J.E., Barsi, D.C., Mosseler, A., and Campbell, M. 2006. Genetic variation and control of chloroplast pigment concentrations in *Picea rubens*, *Picea mariana* and their hybrids. I. Ambient and elevated [CO_2] environments. *Tree Physiology* **27**: 353–364.

Traits related to light-energy processing have significant ecological implications for plant fitness. We studied the effects of elevated atmospheric CO_2 concentration ([CO_2]) on chloroplast pigment traits of a red spruce (RS) (*Picea rubens* Sarg.)–black spruce (*P. mariana* (Mill.) B.S.P.) genetic complex in two experiments: (1) a comparative species' provenance experiment from across the near-northern part of the RS range; and (2) an intra- and interspecific controlled-cross hybrid experiment. Results from the provenance experiment showed that total chlorophyll (a + b) concentration was, on average, 15% higher in ambient [CO_2] than in elevated [CO_2] ($P < 0.001$). In ambient [CO_2], BS populations averaged 11% higher total chlorophyll and carotenoid concentrations than RS populations ($P < 0.001$). There were significant species, CO_2, and species × CO_2 interaction effects, with chlorophyll concentration decreasing about 7 and 26% for BS and RS, respectively, in response to elevated [CO_2]. Results from the hybrid experiment showed that families with a hybrid index of 25 (25% RS) had the highest total chlorophyll concentrations, and families with hybrid indices of 75 and 100 had among the lowest amounts. Initial analysis of the hybrid experiment supported a more additive model of inheritance; however, parental analysis showed a significant and predominant male effect for chlorophyll concentration. In ambient and elevated [CO_2] environments, crosses with BS males had 10.6 and 17.6% higher total chlorophyll concentrations than crosses with hybrid and RS males, respectively. Our results show that chlorophyll concentration is under strong genetic control, and that these traits are positively correlated with productivity within and across species. A significant positive correlation between chlorophyll concentration and the ratio of total plant N to root dry mass was also found ($r = 0.872$). The data indicate that RS would probably be at a competitive disadvantage in an environment with high CO_2 concentrations.

Moreau, G., and Lucarotti, C.J. 2007. A brief review of the past use of baculoviruses for the management of eruptive forest defoliators and recent developments on a sawfly virus in Canada. *The Forestry Chronicle* **83**: 105–112.

An overview is presented of the state of knowledge on the use of baculoviruses—a family of virulent insect viruses exhibiting narrow host ranges—for the suppression of insect outbreaks in Canadian forests. Emphasis is on recent investigations using NeabNPV against the balsam fir sawfly and the pine false webworm.

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O'Connell, L.M., Mosseler, A., and Rajora, O.P. 2006. Impacts of forest fragmentation on the mating system and genetic diversity of white spruce (*Picea glauca*) at the landscape level. *Heredity* **97**: 418–426.

We studied the mating system of white spruce (*Picea glauca*) in a landscape fragmented by agriculture in northern Ontario, Canada. We sampled 23 stands that ranged in size from 1 to >500 trees isolated by 250–3000 m from the nearest other stand. Six polymorphic allozyme loci from four enzyme systems were used to genotype approximately 10 000 embryos from 104 families. We detected no allele frequency heterogeneity in the pollen pool among stands or families (Φ_{FT}= -0.025). Overall, estimates of outcrossing were high (t_m = 94% and mean t_s = 91%) but significantly different from unity. Bi-parental inbreeding (t_m-t_s = 3.2%) was low but significantly different from zero. Allozyme-based outcrossing estimates did not differ significantly among three stand-size classes (SSCs): small (<10 trees), medium (10–100 trees) and large (≥100 trees). The number of effective pollen donors was high in all SSCs, but was significantly lower in small stands (N_{ep} = 62.5) than in medium-sized and large stands (both N_{ep} = 143). The primary selfing rate was significantly higher in medium stands than in large stands. We found no significant difference in genetic diversity measures in the filial (seed) population among SSCs. Overall, these results indicate that white spruce stands in this fragmented landscape are resistant to genetic diversity losses, primarily through high pollen-mediated gene-flow and early selection against inbred embryos. We discuss the importance of using seed data, in conjunction with genetic data, to evaluate the impacts of fragmentation on natural populations.

Proceedings Articles

Karnosky, DF., Darbah, J.N., Sober, A., Riikonen, J., Kets, K., Nelson, N., Kubiske, M., and Percy, K.E. 2006. Ozone effects on growth and productivity of *Populus tremuloides* Michx.: a comparison of results from OTC, FACE, and ozone gradient studies with a common set of genetic materials. Pages 325–329 *in* G. Wieser and M. Tausz, editors. *Proceedings*, *UN-ECE Critical Levels of Ozone: Further Applying and Developing the Flux-based Concept.* 15–19 November 2005, Obergurgl, Tyrol, Austria. Federal Research and Training Centre for Forests, Natural Hazards and Landscape (BFW), Vienna, Austria.

Percy, K., Nosal, M., Heilman, W., Dann, T., Sober, J., and Karnosky, D. 2006. The North American ozone air quality standard: efficacy and performance with two northern hardwood forest tree species. Pages 85–90 *in* G. Wieser and M. Tausz, editors. *Proceedings, UN-ECE Critical Levels of Ozone: Further Applying and Developing the Flux-based Concept.* 15–19 November 2005, Obergurgl, Tyrol, Austria. Federal Research and Training Centre for Forests, Natural Hazards and Landscape (BFW), Vienna, Austria.