HODJAT, S. H. University of Shahid Chamran, Ahwaz IRAN. **Known facts about the ecology of *Myzus* species in Iran in comparison to recent world investigations.**

There are seven or nine species of *Myzus Passerini*, 1860 in Iran. Subgenera of *Nectarosiphon* are represented by four to six names of the *Myzus* species group in Iran. The green peach aphid *Myzus (Nectarosiphon) persicae* (Sulzer, 1776) is well adapted to various climatic conditions. In Khuzistan with hot dry summers and mild winters it is collected from over 50 host species from November to April. In April, alatae migrates to the cooler Zagros mountains. In these regions as well as in Tehran districts, they overwinter as nymphs on *Asteracea* or eggs on peach and almond. In very cool Alborz mountain regions they overwinter only in egg form on peach. Radiation in *Myzus* species is possibly the result of coevolution with their host plant as a result of environmental stress. Sources of stress may be abiotic or changes in secondary metabolite of their host plant. In IBP investigation *M. persicae* was abundant on potato in Europe while in Karaj (40 km south west Tehran) in 1970 the infestation was very low. The population of *M. persicae* on safflower in Ahwaz was higher on Nebrasca varieties and lower on local Arak variety. The alate record of winter Ahwaz popultion in yellow trap was surprisingly very high, specially in March. In this review possibilities of Myzus radiation and adaptation to various other hosts is described as new taxon names. The recent literatures of world investigation on the *Myzus* group is compared with what is known as species radiation under environmental stress.

HOFFA, E. A. and M. E. HARMON. Oregon State University, Corvallis, OR 97331 USA. **Carbon cycling on the edge.**

Analyses of carbon dynamics at the landscape and regional scale usually do not consider spatial interactions. This is based on the notion that carbon dynamics can be modeled within patches that are then added up to predict landscape or broader scale dynamics (i.e., an additive approach). We reexamined this assumption by first identifying the temporal and spatial scales where spatial interactions (the transfer of material from one place to another) strongly influence carbon dynamics. We then used a forest process model to estimate the effect of forest edges on processes (shading, mortality, decomposition) that influence carbon cycling. We found that processes that vary in a nonlinear manner across edges cause carbon dynamics at broader resolutions to depart from an additive estimate. Processes that vary in a linear manner across edges may be obvious at the scale of a forest stand, but become less evident at broader scales given that they tend to be averaged out. In addition to the way process rates change along edges, we found that landscape age structure and the disturbance regime control the degree edges influence carbon dynamics. At low and high elevation sites, shading effects and growth rates at edges increased carbon storage by 2-9% for the entire stand compared to stands with no edge effects. In contrast, carbon storage was reduced when mortality effects at edges were considered. Finally, we report how landscape metrics such as the fractal dimension might be used to estimate the effect of forest edges on carbon dynamics at broad scales.

HOFFMAN, L. L., N. P. R. ANTEN and D. D. ACKERLY. Stanford University, Stanford, CA USA. **The effects of light availability and salinity levels on mangrove seedling growth.**

We studied how salinity levels and light availability influence the growth of mangrove seedlings. We grew two species of neo-tropical mangroves, *Avicennia germinans* and *Rhizophora mangle*, in a multi-factorial greenhouse experiment with three salinity levels (7, 23, 55 ppt NaCl) and four light levels (5, 12, 25, 50% photosynthetically active radiation, PAR). Plants of both species growing at low light did not exhibit significant differences in whole plant biomass at different salinity levels. The negative effects of high salinity on whole plant growth became apparent only at higher light levels. Specifically, in *R. mangle* at low salinity, light availability and growth were positively related. At high salinity, increasing the light availability had no effect on plant growth. However, at medium salinity, there was an intermediate optimum with the most growth at 25% PAR. In *A. germinans*, growth was positively related to light availability at both low and medium salinity, but at high salinity, increasing light availability did not increase growth. In general, root/leaf area increased with increasing salinity and with increasing light availability. At a given light level, plants at high salinity had less transpiration/root mass and transpiration/leaf area than low salinity plants. At a given salinity level, the higher light plants transpired less per unit root mass but slightly more per unit leaf area than low light plants. These results suggest that the salinity level at which a seedling grows affects its ability to utilize light for growth. Field studies seeking to understand mangrove forest dynamics and patterns of seedling regeneration should consider both salinity levels and light availability and the interactions between these two factors.

HOLDER, M. L. and P. D. TAYLOR. Acadia University, Wolfville, NS, Canada. **The effect of landscape structure on peatland dragonflies and damselflies.**

We examined the effects of landscape structure on dragonflies and damselflies (Insecta: Odonata) living in peatland habitat in western Newfoundland. Using a nested spatial design, two separate comparisons of landscape composition were made. In one comparison, the amount of peatland was varied (<20%, 25–45% or 50–70%) while the surrounding habitat type was held constant. In the other comparison the amount of peatland was held constant while the surrounding habitat types differed (forest, scrub or clearcut). Larval populations were sampled and habitat characteristics were measured at discrete pools within each study area. Adult emergence was measured by counting exuviae (shed larval skins) present at each study pool, while adult odonates were surveyed along transects. No significant difference in larval population size or structure was noted in the comparison of landscapes differing in amount of peatland. Analyses indicate pools in peatland surrounded by forest had significantly fewer larvae (7.7 larvae/sample, $p=0.018$) than pools in bogs surrounded by other matrix types (clearcut = 32.9 larvae/sample, scrub = 45.7 larvae/sample). However, this was related to pool pH, which also differed significantly between matrix treatments ($p=0.039$). Age structure of larval populations for at least the two most abundant odonate species showed no significant trend between landscape treatments. Present results show there may be minimal direct effect of landscape structure on peatland odonate populations. However, the influence of landscape structure on pool pH may indirectly affect odonates.

HOLYOAK, M. and M. J. DONAHUE. University of California, Davis CA 95616 USA. **Migration, nutrient transport, and dynamics in source-sink metapopulations.**

Two branches of ecological theory address population dynamics in habitat patches that vary in the amounts of resources they contain. Source-sink theory predicts that births will exceed deaths for source populations with abundant resources, leading to a net production of emigrants, whilst sink populations typically have fewer resources and are net receivers of immigrants. By contrast a model of "balanced dispersal" predicts that patches will produce a net number of emigrants which is inversely related to the carrying capacity of the donor patch. We tested the appropriateness of these models for describing the long-term dynamics and net movement within replicated microcosms containing a food chain consisting of decaying seeds, bacteria and a ciliated protist, *Colpidium striatum*. Both the rates of decline of *C. striatum* populations and rates of decomposition of seed resources were strongly influenced by the amount of between-patch migration that was possible. Experimental estimates of the amount of between-patch movement of *C. striatum* broadly supported the balanced dispersal model. However, there were complex feedbacks between movement rate and within-patch dynamics that are not predicted by this model. Isolated patches were used to establish a relationship between protist body size and nutrient (seed) level. Estimates of protist body size within connected patches then provided evidence that migrating organisms moved nutrients with them. Net movements of individuals between patches did not predict either the amount or the direction of net fluxes of protist biomass, which were also influenced by the body size and density of migrating individuals. The results show the importance of studying who is migrating, when individuals differ, if we are to understand source-sink inversions and the subsidy of ecosystems by transport of materials and energy by migrating individuals.