Macroinvertebrate Bioassessment in Temporary Wetlands: Limitations and Opportunities

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EDITORS' COMMENTS. The following abstract was used by D. Christopher Rogers for his oral presentation at the vernal pool conference in March 2010. Although he did not provide a manuscript for this book, the editors felt it would be useful to present a few comments. The understanding of the aquatic invertebrate communities in vernal pools depends upon support by individuals such as Rogers that are primarily taxonomists.

ABSTRACT. Bioassessment using macroinvertebrate community structure and composition is a powerful and important tool for gauging overall habitat health and functionality. This tool is being used with increasing frequency in vernal pool restoration, recovery, construction, and general habitat monitoring. However, bioassessment in these temporary habitats is constrained by the limits of our understanding of the taxonomy of temporary water invertebrates. However, even with some limitations, bioassessment is a far more powerful tool than other temporary wetland assessment methods. Bioassessment is quantitative, replicable, verifiable, and is sensitive to small perturbations in the habitats being studied.

CITATION. Rogers, D. C. 2011. Macroinvertebrate bioassessment in temporary wetlands: limitations and opportunities. Pages 101-103 in D. G. Alexander and R. A. Schlising (Editors), Research and Recovery in Vernal Pool Landscapes. Studies from the Herbarium, Number 16. California State University, Chico, CA.

SUMMARY COMMENTS

Rodgers advanced that bioassessment of California vernal pools using macroinvertebrate presence and community structure is an important tool for gauging overall habitat health and functionality. He stated that assessment is quantitative, replicable, verifiable and sensitive to small differences in vernal pool habitats.

The percent community composition of major macroinvertebrate taxa is illustrated in Figure 1. These macroinvertebrate taxa from California and Oregon seasonal wetlands are found globally in a variety of temporary pools, some of which are dissimilar from pools in California vernal pool landscapes.

Although branchiopod crustaceans, and insects (immature and adult) are better understood than other invertebrates, limitations in taxonomic understanding make invertebrate bioassessment of California vernal pools using macroinvertebrates challenging. Furthermore, the times of collection (early, mid- and late) display different macroinvertebrate taxa presence and absence (Figure 2). Temporary pools, including California vernal pools, display differences in community composition, comparing early, mid and late collections (Figure 3).

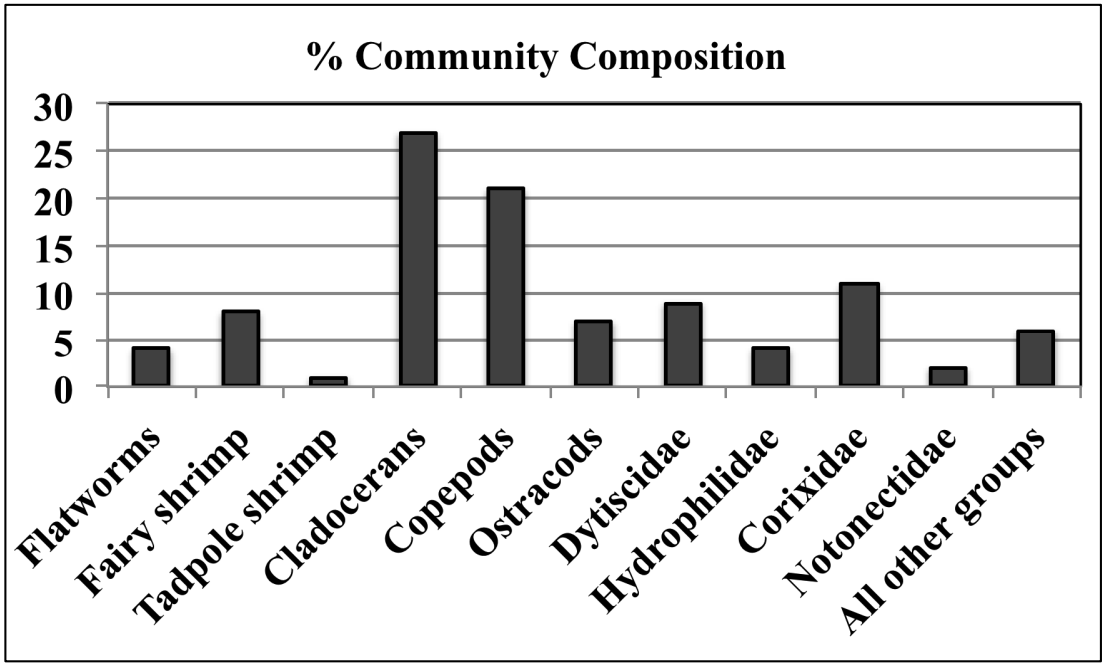

FIGURE 1. Percent macroinvertebrate community composition, averaged from 200 California and Oregon seasonal wetlands in 1989. (Presented by Christopher D. Rogers at the 2010 vernal pool conference in Chico.)

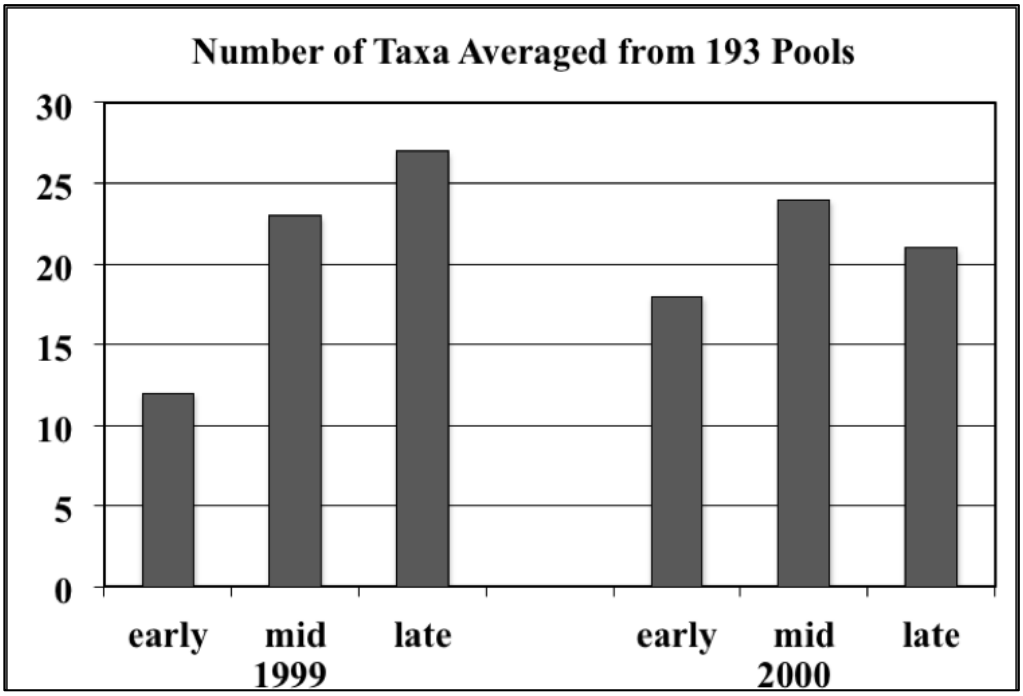

FIGURE 2. Number of macroinvertebrate taxa, averaged from 193 temporary pools in western United States, comparing samples from 1999 and 2000. This information indicates seasonable differences are not necessarily the same from year to year. (Presented by Christopher D. Rogers at the 2010 vernal pool conference in Chico.)

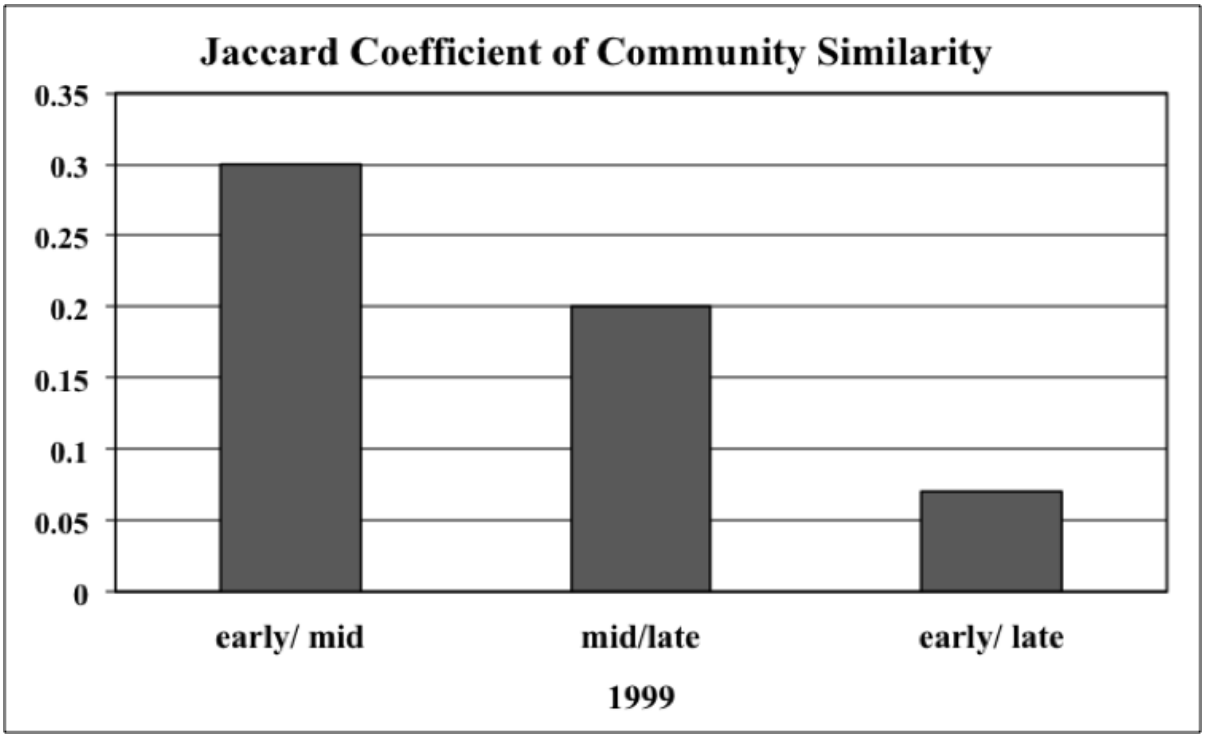

FIGURE 3. Jaccard coefficient of community similarity (ranging from 0 when no species are found in both communities to 1 when all species are found in both communities), comparing macroinvertebrates collected from temporary pools in 1999. This information indicates that community structure changes from early to mid to late season. (Presented by Christopher D. Rogers at the 2010 vernal pool conference in Chico.)