Functional Groups in Wetland and Riparian Plants: A Strategic Perspective

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Wetland and riparian plants, like all living organisms, can be classified in two entirely different ways. I have written elsewhere (in Plants and Vegetation) about this paradox: although there is one Earth, we apparently need two systems to describe the evolution of life forms. The first system is phylogenetic, beginning with Linnaeus (and flower morphology) and ending with the Angiosperm Phylogeny Group (and DNA sequences). This is a powerful way to retrace the origins and evolution of plants, but is rather useless for ecological prediction. The second system is functional. In the broad sense, it is almost the opposite of the phylogenetic approach, because we are seeking patterns in evolutionary convergence. Plants from different origins have converged to become 'mud flat annuals' or 'clonal dominants' or 'sclerophyllous shrubs'. For predictive ecology, we need to identify these convergent groups, come up with consistent names for them, identify their key life history traits, and incorporate them into predictive models. I describe this process at some length in Wetland Ecology. It is not a new idea: foundations include Humboldt (19 groups), Raunkiaer (12 groups), Hutchinson (26 groups, just for aquatics), van der Valk (12 groups) and Grime (3 groups). All of these influenced my own team's approach to this problem (with Shipley, Boutin, and others), and our body of work included mass screening for ecological traits such as relative growth rate and relative competitive ability. The path ahead remains clear. We need to compile a matrix of ecological traits that transcends morphology, adding in innovative functional traits for which we must screen systematically: relative growth rate, nutrient conservation, relative competitive ability, juvenile (establishment) traits, and no doubt others. We are nearly there.

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