

Wing Polymorphism in Salt Marsh Inhabiting Fulgoroidea

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The vegetation of New Jersey tidal salt marshes is composed primarily of two grasses, *Spartina alterniflora* Lois. (Smooth Cordgrass) and *Spartina patens* (Ait.) Muhl. (Salt Meadow Cordgrass). *S. patens* occupies a narrow elevational zone of well drained marsh above mean high water level (MHW). *S. alterniflora*, an intertidal species, occurs throughout most of the elevational range of *S. patens*, but also extends to levels far below MHW. Near MHW, where the marsh is flat and poorly drained, *S. alterniflora* occurs as a dwarfed form, but along depressed borders of creeks well below MHW, it may grow to the height of 2m. Structurally (culm height, width, density), *S. alterniflora* is more diverse than *S. patens* and ecologically occupies a more extensive elevational range which receives frequent tidal inundations. Fulgoroids, dimorphic for wing length, feed upon these salt marsh grasses. The purpose of this work

was to investigate the ecological significance of wing polymorphism strategies employed by the fulgorids to cope with the structural variability and stability of food resources. The delphacid, *Prokelisia marginata* (Van Duzee), which is host specific on *S. alterniflora*, produced highly vagile macropters and brachypters with less efficient flight capability. In short form *S. alterniflora*, macropters and brachypters were sweep-netted in equal numbers. The following commonalities were evident for *S. patens* inhabiting fulgoroids [*Delphacodes detecia* (Van Duzee), *Tumidagena minuta* McDermott, *Aphelonema simplex* Uhler]: Brachyptery was extreme, preventing flight. Brachypters significantly outnumbered macropters. The density of brachypters correlated well with the seasonal pattern of standing crop biomass of the food resource. Macropter density was poorly correlated with standing crop biomass; however, seasonal macropter density occurred just prior to peak standing crop biomass of the grass. On the high marsh, which is less subject to tidal inundation and is occupied by a structurally monotonous food resource, fulgoroids have evolved a brachypterous strategy. On the intertidal marsh, where the food resource is structurally diverse and occasionally unavailable (tidal inundation), population mobility is at a premium and fulgoroids have evolved a strategy relatively skewed toward the production of macropters in order to efficiently exploit resources.