EVIDENCE THAT PERIPHERAL ISOLATION IS A COMMON MECHANISM FOR SPECIATION IN *STEPHANODISCUS* EHRENB.

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There is abundant evidence that diatoms and other protists have the capacity to disperse readily at least over moderate distances. If this is true and if this promotes interbreeding among different populations, then one might expect both differentiation among populations and also speciation processes to be restrained or impeded. It is certainly difficult to conceive of speciation in protists as following an allopatric dumbbell model (e.g., some vicariant event separating a single population into two equally large populations). How then do protists speciate? An extreme explanation is that reproductive isolation and speciation is local and instantaneous. There are mechanisms that could cause this to happen. This might be accomplished by a ploidy level change. An alternative is that relatively few mutations could produce instantaneous lack of recognition between cell lineages. A well-documented example of recent speciation in *Stephanodiscus* supports the idea of rapid and instantaneous reproductive isolation accompanied ecological peripheral isolation in at least three populations in the *S. niagarae* complex. But the new species remain isolated in single lakes, and so this arguably may not be generalizable. However, it offers a suggestion into how peripheral isolation as a speciation model may be inferred in more widespread species complexes. Examination of several species complexes in *Stephanodiscus* Ehrenb. have recovered complexes with widespread plesiomorphic forms, closely related to more narrowly distributed (but not endemic) and apomorphic relatives, suggesting that peripheral isolation with subsequent dispersal of the descendent species has occurred several times in *Stephanodiscus*.