Symposium X

THE SYMPATRIC COLONIZATION OF NEW HOSTS BY PARASITES

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The natural sympatric colonization of new hosts by parasitic insects, nematodes, fungi and other eukaryotic organisms has been observed repeatedly, particularly in association with agricultural crops and livestock. However, the genetic and other biological factors involved in host shifts and the evolutionary significance of host race formation are not well understood. In certain fungi, nematodes and protozoa there is a clear gene-for-gene coevolved system of host-parasite interactions. Host recognition and survival on the part of the parasites is mediated by genetically specified molecular cues at the cell surface and by other host-associated cellular components. Prokaryotic and viroid intra- and extracellular symbionts can play an important role in determining host specificity in some parasitic insects. Survival on a new host may depend on genetic changes in the symbionts or its associated plasmids coupled with genetic changes for host recognition in the insect. Several examples of gene-for-gene coevolved systems and models of sympatric host race formation and speciation involving symbionts are explored. The results suggest that relatively few genetic changes are required to initiate a host shift and speciation.