

# Hybridization of human and rodent schistosome parasites in western Kenya.

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## Abstract

Hybridization and introgression can have important consequences for the evolution, ecology and epidemiology of pathogenic organisms. We examined the dynamics of hybridization between a trematode parasite of humans, *Schistosoma mansoni*, and its sister species, *S. rodhaini*, a rodent parasite, in a natural hybrid zone in western Kenya. Using microsatellite markers, rDNA and mtDNA, we showed that hybrids between the two species occur in nature, are fertile and produce viable offspring through backcrosses with *S. mansoni*. Averaged across collection sites, individuals of hybrid ancestry comprised 7.2% of all schistosomes collected, which is a large proportion given that one of the parental species, *S. rodhaini*, comprised only 9.1% of the specimens. No F1 individuals were collected and all hybrids represented backcrosses with *S. mansoni* that were of the first or successive generations. The direction of introgression appears highly asymmetric, causing unidirectional gene flow from the rodent parasite, *S. rodhaini*, to the human parasite, *S. mansoni*. Hybrid occurrence was seasonal and most hybrids were collected during the month of September over a 2-year period, a time when *S. rodhaini* was also abundant. We also examined the sex ratios and phenotypic differences between the hybrids and parental species, including the number of infective stages produced in the snail host and the time of day the infective stages emerge. No statistical differences were found in any of these characteristics, and most of the hybrids showed an emergence pattern similar to that of *S. mansoni*. One individual, however, showed a bimodal emergence pattern that was characteristic of both parental species. In conclusion, these species maintain their identity despite hybridization, although introgression may cause important alterations of the biology and epidemiology of schistosomiasis in this region.