

Centromere-proximal differentiation and speciation in *Anopheles gambiae*

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The M and S molecular forms of *Anopheles gambiae* are undergoing speciation. We hypothesized that their divergence in the face of gene flow is facilitated by reduced recombination at the centromeric (proximal) end of the X chromosome. We sequenced introns from 22 X chromosome genes in M and S from two locations of West Africa where the forms are sympatric. In both forms, nucleotide diversity was generally high distally, lower proximally, and very low nearest the centromere. Conversely, differentiation between the forms was virtually zero distally, and very high proximally. Pairwise comparisons to a close relative, the sibling species *A. arabiensis*, demonstrated uniformly high divergence regardless of position along the X chromosome, suggesting that this pattern is not purely mechanical. Instead, the pattern observed for M and S strongly suggests the action of divergent natural selection countering gene flow, only at the proximal end of the X chromosome where recombination is reduced. Comparison of sites with fixed differences between M and S, to the corresponding sites in *A. arabiensis* revealed that derived substitutions had been fixed in both forms, further supporting the hypothesis that both have been under selection. These derived substitutions are fixed not only in the two West African samples, but also in samples of S from western and coastal Kenya, suggesting that selection occurred before the forms expanded to their current ranges.