Allele Sharing and Evidence for Sexuality in a Mitochondrial Clade of Bdelloid Rotifers

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Genetics June 2015 200:581–590

EDITORS' NOTE Eukaryote lineages don't usually survive for long without sex. But bdelloid rotifers—minute freshwater invertebrates—have long been held as completely asexual oddities of the animal kingdom. Signorovitch *et al.* find evidence that bdelloid rotifers collected in the wild in fact show genomic patterns consistent with sexual reproduction and an unusual type of meiosis.

ABSTRACT Rotifers of Class Bdelloidea are common freshwater invertebrates of ancient origin whose apparent asexuality has posed a challenge to the view that sexual reproduction is essential for long-term evolutionary success in eukaryotes and to hypotheses for the advantage of sex. The possibility nevertheless exists that bdelloids reproduce sexually under unknown or inadequately investigated conditions. Although certain methods of population genetics offer definitive means for detecting infrequent or atypical sex, they have not previously been applied to bdelloid rotifers. We conducted such a test with bdelloids belonging to a mitochondrial clade of *Macrotrachela quadricornifera.* This revealed a striking pattern of allele sharing consistent with sexual reproduction and with meiosis of an atypical sort, in which segregation occurs without requiring homologous chromosome pairs.