

OR071*Causes and consequences of thelytoky in the ant Cerapachys biroi*

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Workers of the queenless ant *Cerapachys biroi* reproduce by thelytokous parthenogenesis, but the cytological mechanism is currently unknown. We therefore determined the mode of asexual reproduction in *C. biroi* by observing chromosomes stained with DAPI during oogenesis and early embryogenesis. Our results show that eggs undergo regular meiotic division within the first half hour after oviposition. Following the second meiotic division, the two central haploid nuclei fuse to restore diploidy, showing that *C. biroi* reproduces via automixis with central fusion. Automixis with central fusion incurs loss of heterozygosity (LOH) due to meiotic recombination as has been observed in other thelytokous social insects such as the Cape honeybee and the ants *Wasmannia auropunctata* and *Cataglyphis cursor*. LOH in these species also leads to high proportions of sterile diploid males. Using RAD-Seq, we show that the rate of LOH in *C. biroi* is as low as 0.0013% per generation: substantially lower than in the other thelytokous ants studied, and ca. 100 times lower than in the Cape honeybee. As a consequence, the genomes of *C. biroi* nestmates are almost clonally identical. Furthermore, diploid males are exceedingly rare in this species, with only ca. one out of 10,000 diploid individuals being male. It is currently not known whether the low rate of LOH is due to reduced levels of recombination, selection against recombinants, or both. We are currently aiming to measure the strength of selection against recombinants by genotyping individuals at the egg and adult stage. We are also studying potential molecular players, such as recombinase proteins, that could be involved in lowering recombination rates in *C. biroi*.