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Team swimming in ant spermatozoa

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Eusocial bees, wasps and ants are unique in many respects, including their mating biology. Reproductive activity is typically concentrated into a brief mating flight early at sexual maturation. Males die after mating, and their reproductive success is ultimately limited by the amount of sperm effectively stored in the queen's spermatheca. In species where queens mate promiscuously, competition between ejaculates from different males is expected to impose intense selective pressure on males to optimize the transfer of sperm to the storage organ. While investigating the effect of sperm competition on sperm traits in the ant *Cataglyphis savignyi*, we found that males ejaculate highly motile sperm bundles. In these aggregates, 50-100 sperm cells are oriented in the same direction and bound together with their acrosome stuck in an agglutinative cap of extracellular material. Flagella remain completely free and propel the bundles forward in a characteristic helical pattern. Sperm motility trials showed that sperm aggregates swim 51% faster on average than isolate sperm cells. The difference was particularly marked at high viscosity, where bundles move 2 times faster than solitary cells. By forming cooperative groups, sperm increase their swimming efficiency and, hence, potentially benefit from a significant advantage in a context of sperm competition for access to the spermatheca.