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Why are there 'lazy' ants? How worker inactivity can arise

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Most animals are remarkably lazy, spending upwards of 50% of their waking hours resting. This behavior is pervasive across a wide range of ecologies and life histories. However, inactivity also varies widely within and across species, even among the genetically similar nestmates of social insect colonies. By measuring circadian activity profiles, and comparing field and lab activity levels, we have eliminated the possibilities that inactivity results from temporal sampling biases and lab artifacts, thus validating the ecological relevance of this behavior. Using automated spatial tracking, we linked high levels of inactivity to a suite of characteristics, including slower walking speeds, and spatial fidelity zones within the nest. Here, I test leading hypotheses explaining inactivity in social insects. We pay special attention to the notions that (1) inactivity is a form of social cheating in which egg-laying workers selfishly invest in their own reproduction rather than contribute to colony fitness, and (2) inactivity results from immaturity or senescence of workers. We show that highly inactive workers in the ant *Temnothorax rugatulus* have more oocytes in their ovaries, indicating a significantly greater reproductive potential compared to other workers. This suggests that inactive workers may be benefitting from the work of their nestmates, and selfishly diverting colony resources towards their own reproduction. We also found that very young workers (<10 days) are significantly more inactive than their older nestmates, but quickly reach similar activity levels (after ~20 days). Colony inactivity was strongly affected by brood/worker ratios which increased as more workers emerged and less brood were left to care for. These results provide insight into the complex nature of inactivity, and the many ways variation among workers can arise, including selfish worker reproduction, and stochastic and predictable fluctuations in work demand, and worker surplus.