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Why acquiesce? Worker reproductive parasitism in Apis

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Reproductive acquiescence theory is a popular explanation for the absence of worker reproduction in social insects. This theory posits that in the presence of an effective policing system, the incentive for worker reproduction is removed, and therefore workers should not attempt reproduction. This theory is supported by empirical studies of a variety of Hymenopteran taxa suggesting that when policing is efficient, workers are less likely to attempt to reproduce. The Asian hive bee *Apis cerana* presents a unique opportunity to test reproductive acquiescence theory as it has high levels of ovary activation even when a queen is present, but very few adult males are the sons of workers. We regularly sampled male eggs and pupae, which were genotyped to determine maternity, and adult workers which we dissected to check for levels of ovary activation. Interestingly, we found that 3.8% of male eggs and 1.1% of male pupae were worker-produced. We also found high rates of ovary activation (11.7% overall). Similarly, in a long-term study the well-known Western honeybee *A. mellifera*, we regularly sampled adult workers (for dissection) and male pupae (for genotyping) throughout the course of a season. We found that, contrary to previous studies, workers are actually mothers of 4.2% of males and up to 1.2% of workers have active ovaries. We used this new data to conduct a meta-analysis of reproductive acquiescence theory. When our new data were included, the strong negative correlation between policing efficiency and proportion of reproductive workers was weakened considerably. So far most studies have been performed on species in which the queen mates multiply. What we need now is data on monandrous species. Only then can we properly assess the value of reproductive acquiescence theory as a general explanation for reproductive division of labour in social insects.