



Male paper wasps are not just flying sperm

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In the eusocial Hymenoptera, females may gain indirect fitness via helping relatives or direct fitness via egg-laying. In contrast, males typically disperse to mate, limiting fitness gains to direct potential. Intriguingly, there are accounts of natal males in the eusocial Hymenoptera helping on the nest, of distributing food to, defending, and thermoregulating brood. An outstanding question is whether helping is an integral part of male life history, and if so what regulates this behaviour? We investigate this in the tropical paper wasp *Polistes lanio*, through behavioural field observations, reproductive analyses, and experimental manipulations. We found that males delay dispersal from the nest upon emergence, whilst the seminal vesicles and accessory glands increase in size with age. When food was received from foraging females, natal males frequently fed brood. However, when natal males were experimentally given a food item each day, both acceptance of the food offering and subsequent feeding to brood (when food was received) decreased with age before dispersal. Newly emerged males therefore appear to help, whilst older males do not. We propose that juvenile hormone may be ultimately regulating this process. Experimental treatment using the analog methoprene resulted in accelerated rates of reproductive development and precocious dispersal. These results provide evidence of male helping in *P. lanio*, and suggest this behaviour is likely to be dependent on a life history transition regulated by maturation and juvenile hormone. Helping in males may contribute to inclusive fitness via indirect fitness in helping relatives before dispersal, or alternatively males may be 'paying-to-stay' on the natal nest until optimal conditions for exploiting direct fitness arise. These findings call into question the prevailing idea that males in eusocial Hymenoptera are just flying sperm, and open new research opportunities on the evolution of altruism in social groups.