Deciphering the code. Cuticular hydrocarbons correlate with age, mating status and fertility in queens of the Argentine ant (*Linepithema humile*, Mayr).

[Descifrando el código. Los hidrocarburos cuticulares se correlacionan con la edad, el estado reproductivo y la fertilidad en las reinas de hormiga argentina (*Linepithema humile*, Mayr)]

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In insect societies, chemical communication plays an important role in colony reproduction and individual social status. Maintaining social cohesion and resolving reproductive conflicts between queens and workers is possible because nestmates efficiently exchange information on their reproductive's physiological state. Queens should honestly signal their degree of fertility and allow workers to act in their own interests by controlling the queen's reproductive contribution and by limiting their own reproduction or that of fellow workers. Because it benefits both queens and workers, this strategy is evolutionary stable. It is hypothesized that if these chemical compounds act as honest signals, they should correlate with fecundity and mating status. Many studies indicate that cuticular hydrocarbons (CHCs) are the main chemical compounds encoding reproductive status. However, these studies have largely focused on queenless or monogynous species with workers capable of egg laying. Here, we used the Argentine ant as a model to examine the role of cuticular hydrocarbons in expressing reproductive information in a complex insect society with permanently sterile workers. The Argentine ant is unicolonial, highly polygynous and polydomous. We identified several CHCs whose presence and levels were correlated with age, mating status and fertility in queens. Moreover, we found that both egg–laying rates and ovarian index values were correlated with relative quantities of CHCs. The main compounds associated with these two reproductive variables were an alkene ($C_{29:1}$), two mono–methyl alkanes (5–MeC_{27} and 5–MeC_{29}), and two di–methyl alkanes (5,11–diMeC_{29} and 5,11–diMeC_{31}). These results suggest that the compounds serve as fertility signals. Overall, the results of this study support the "queen signal" hypothesis and suggest an additional perspective on the biological function of CHCs in queens. Indeed, their purpose appears to extend beyond the repression of worker reproduction.