

Crickets that live fast die young

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Male crickets advertise their attractiveness with a loud and clear call to females. Calling effort has been linked to more mating success, but what are the hidden costs of showing off?

David Hosken, an [evolutionary biologist](#) based at the University of Exeter, and his team looked at crickets to understand how [sexual performance](#) and [life expectancy](#) are related to metabolic rate.

'Metabolism can be thought of as the burning of fuel that keeps us alive.' explains Hosken. 'Metabolic rate is the speed at which we burn the fuel. If we burn it faster we die younger.'

Translating the analogy to [living organisms](#), the team reasoned that the resting metabolic rate – 'the body's idling speed' – may influence the amount of energy which is left to be used in other tasks.

Resting metabolic rate varies from individual to individual, even within the same species, and some crickets will have a smaller energy budget than others. This means the energy available for expensive advertising of sexual maturity will vary and some crickets will have less energy at the end of the day. 'This in turn could have an impact on lifespan,' says Hosken.

To test this prediction, the team followed the life of about 70 lab-raised crickets. They started by measuring the calling effort of the ten-day old males with a microphone fitted in a custom-build chamber. The device was on for about 15 hours and recorded how much time each cricket spent calling out for mates.

The next day, the crickets were weighed and moved to a different chamber, to assess their resting metabolic rate. This was done by measuring the amount of carbon dioxide produced by each individual. Crickets with a higher metabolic rate produced more carbon dioxide. Following these tests, the male crickets were housed in their own container and provided with food and water until the end of their natural lives.

The results, published in *Behavioral Ecology and Sociobiology*, show that [crickets](#) with a higher resting metabolic rate have lower life expectancy: 'males that live fast die young,' says Hosken.

Surprisingly, the effort invested in sexual signals – the amount of time spent calling – was not part of the equation: 'In our study we found no evidence that calling effort influenced longevity,' he adds. This might be because 'our calling measure was not good enough or because good quality individuals can call more and have relatively low metabolic rate, just as some individuals can buy an expensive house and an expensive car' suggests Hosken.

The lack of a clear relationship between calling effort and longevity shows that the mechanisms behind the balance might be more complex than previously thought. Hosken points out that the links between physiological performance measures (such as [metabolic rate](#)) and behaviour traits (sexual signals) are 'largely under-explored even though they are likely to be very important.'

More information: K Okada, WR Pitchers, MD Sharma, J Hunt and DJ Hosken. Longevity, calling effort, and metabolic rate in two populations of cricket. *Behav. Ecol. Sociobiol.*, [doi:10.1007/s00265-011-1185-3](https://doi.org/10.1007/s00265-011-1185-3)

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