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Courting serrate-legged treefrog males change croaks for fragrant females



A male serrate-legged treefrog (*Kurixalus odontotarsus*) croaking in the rain forest. Photo credit: Ke Deng.

In the game of love, the pressure is usually on males to impress. Male birds go all out with elaborate plumage, while stags with the largest antlers tend to be the monarch of the glen and boastful male koalas rumble deep for the ladies. However, most males do not serenade in solitude. ‘They compete directly for females’, says Ke Deng from the Chinese Academy of Sciences, adding that suitors must outperform each other to be successful in courtship. But Deng and Jian-Guo Cui, also from the Chinese Academy of Sciences, wondered whether the presence of a female might alter how males vie against each other. To find out, Deng, Qiao-Ling He, Ya Zhou, Bi-Cheng Zhu, Tong-Liang Wang, Ji-Chao Wang and Cui played recordings of male serrate-legged treefrog (*Kurixalus odontotarsus*) croaks to individual male suitors to find out whether the presence of a female caused the male love-interest to alter his repertoire.

‘This treefrog is an interesting species, which has complex calls and various call types’, says Cui, recalling how he and his colleagues headed into the tropical rainforest of Diaoluo Mountain, Hainan, China, in search of the serenading males and their females. ‘Working in the rainforest is not easy; we have to suffer the heat and humidity, there’s no escape from mosquitoes and leeches and we are at risk from different snakes’, says Deng. Having collected egg-laden females in search of a mate and potential suitors, the team set up serrate-legged treefrog speed dates with a twist. On some occasions the male could see the female, but not smell her when encased in a glass jar; other times the female was secluded behind a screen, so the male could only smell her scent; and in the remaining situations the male could see and smell the object of his affection. ‘When we were close, we

could sometimes smell the serrate-legged treefrog odour faintly, especially when we handled them’, Deng says, adding that the aroma was quite earthy. Then the scientists turned up the pressure on the male by playing recordings of rival male croaks – two types that the females find alluring and aggressive calls that intimidate competing suitors into silence – while recording the male’s responses, to discover whether the presence of an attractive lady caused them to change their tune.

And the answer was emphatically ‘yes’. ‘The males reduced the total number of calls in response to the presence of females, regardless of how they perceived the females’, says Deng. Also, the males that could only smell the attractive females switched to producing more aggressive calls when listening to their recorded rivals. In short, the female’s odour had a dramatic effect on a suitor’s reaction to his rivals, increasing his bravado and suggesting that love isn’t only in the eye of male serrate-leg treefrog beholders. Cui and his colleagues are also keen to find out how courting treefrog males combine information from their different senses to tell them when it’s time to scare off the opposition in order to catch the attention of someone special.

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