

# Males of great bustard self-medicate to appear more attractive to females

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A great bustard female inspects the cloaca exhibited by the male. Credit: Franz Kovacs

Males of great bustard consume small doses of poison with a dual purpose: to eliminate intern parasites and, especially, to look healthier and stronger before females, allowing them to achieve a greater reproductive success. A team of researchers from the Spanish National Research Council has now suggested for the first time that this function

of self-medication could be a mechanism of sexual selection. The study results are published in the *PLOS ONE* journal.

Juan Carlos Alonso, who led the project, CSIC researcher at the Department of Evolutive Ecology of the Spanish National Museum of Natural Sciences, explains that: "The team of researchers has discovered that the great bustards consume two species of blister beetles (*Berberomeloe majalis* and *Physomeloe corallifer*) that are avoided by most predators due to their content of cantharidin, a very toxic compound that in small doses can kill most animals, including man.

Alonso explains that this behavior of the [great bustard](#) is because some animals have evolved the ability to tolerate toxics, and even to use them as medicine against infections. This adaptation, innately developed in this animals, is known as self-medication. In fact, cantharidin has a potent antibacterial and anthelmintic effectiveness, so bustards can use it as medicine against gastrointestinal infections caused by bacteria, tapeworms and nematodes, which are frequent in these birds and can be transmitted sexually.

Both males and females consume these blister beetles, but only males chose them among all the available insects. Actually, males consume them in a larger quantity and size than females. Alonso states that "they eagerly look for them in spring, when the stress produced by the hard mating behavior and the strong competition among males to access to females make them more vulnerable to infections". The authors of the study suggest that great bustard males use cantharidin to reduce their parasite load in order to look healthier, stronger, and thus more attractive for females.

This consumption would explain why males display their cloaca (the cloaca is the final opening of the digestive tract in birds, but also the excretory organ of their urinary system, and their copulatory organ in the

absence of a penis) when they approach females, and why females conduct such a meticulous inspection of the males cloaca.

Alonso asserts that "the white plumage surrounding the cloaca allows the female to clearly visualize if the area coming into contact during copulation is free of parasites or signs of their presence, such as dirt produced by diarrhea. The importance of choosing the healthiest, strongest and best capable male to withstand the effects of cantharidin gives full meaning to the scrupulous inspection conducted by a female among several males before choosing a consort".

Alonso considers that "this function of self-medication was never before suggested or investigated as a mechanism involved in the process of [sexual selection](#). However, self-medication could be of great importance, especially in polygamous species, in which competition among [males](#) is specially intense, and females are the ones that choose the male that will fertilize them".

The authors explain that self-medication can be a significant mechanism involved in the process of sexual selection. Just like male peacocks have developed longer tail feathers with the sole purpose of attracting females, assuming the consequent burden when they have to escape predators, the male of great bustard assumes the risk of consuming a highly toxic product, not only to get rid of parasites but also to show [females](#) that is resistant to toxicity, and that this resistance can be transmitted to their offspring.

**More information:** Carolina Bravo, Luis Miguel Bautista, Mario García-Paris, Guillermo Blanco and Juan Carlos Alonso. Males of a strongly polygynous species consume more poisonous food than females, *PLOS ONE*. [DOI: 10.1371/journal.pone.0111057](https://doi.org/10.1371/journal.pone.0111057)

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