

## Winged Wisdom: The Surprising Health Hacks of Birds

In a stunning revelation from the animal kingdom, the great bustard, a majestic flyer, has been found to engage in a practice that mirrors human herbal medicine.

Analysis by Dr. Karen Shaw Becker

### STORY AT-A-GLANCE

- Great bustards, the heaviest flying birds on Earth, seem to seek out specific medicinal plants, perhaps to self-medicate against parasites and pathogens
- Scientists collected 623 droppings from the birds and analyzed their contents of different plant species
- Two different plants — corn poppies (*Papaver rhoeas*) and purple viper's bugloss (*Echium plantagineum*) — appeared in abundance
- Both plants have antiparasitic effects while purple viper's bugloss is also antifungal
- Due to great bustards' unique mating process, which is so elaborate it takes a toll on males' immune systems, it's likely the medicinal plants may be used for their immune-boosting properties as well

Humans have long depended on the power of wild plants for healing, but we're not the only ones. Great bustards, which are the heaviest flying birds on Earth, also seem to seek out specific medicinal plants, perhaps to self-medicate against parasites and pathogens.

Specifically, males of the species may seek out particular plants during mating season, a time when their immune system is weakened.

### Great Bustards May Self-Medicate by Eating Medicinal Plants

While it's suspected that many animals, from macaws to honeybees, self-medicate, it's difficult to prove that they're seeking out certain plants for their medicinal properties. To see if great bustards are among them, scientists with the National Museum of Natural Sciences in Madrid and colleagues collected 623 droppings from the birds and analyzed their contents of different plant species.<sup>1</sup>

Two different plants — corn poppies (*Papaver rhoeas*) and purple viper's bugloss (*Echium plantagineum*) — appeared in abundance. Corn poppy seeds contain fatty acids and are used in traditional medicine for their pain relieving, sedative and immune-boosting effects. Purple viper's bugloss contains seeds rich in edible oils, but is poisonous to humans and cattle in large quantities.<sup>2</sup>

The scientists tested the plants against several bird parasites, including nematodes, or parasitic worms, the protozoon *Trichomonas gallinae* and *Aspergillus niger*, a fungus. Both plants had antiparasitic effects while purple viper's bugloss was also antifungal.

“Great bustards seek out two species of weeds that are also used by humans in traditional medicine. We show that both contain antiprotozoal and nematocidal (i.e., worm-killing) compounds, while the second also contains antifungal agents,” study author Azucena Gonzalez-Coloma, with the Institute of Agricultural Sciences in Madrid, said in a news release.<sup>3</sup>

Parasitic and fungal infections may cause up to 30% of deaths in great bustards, and previous studies found the birds also eat blister beetles, which most other animals do not.<sup>4</sup> It turns out the bugs contain toxic cantharidin, which may reduce their parasitic load. Males ate more of the beetles than females, perhaps to increase their sexual activity and attractiveness. According to the study, published in *Frontiers in Ecology and Evolution*:<sup>5</sup>

*“Before selecting a mate for copulation, a female bustard may examine the cloaca of the displaying male and usually pecks it, probably looking for macroparasites such as *Otiditaenia conoides* ... a higher consumption of blister beetles by males could be a sexually-selected mechanism to enhance their mating success.”*

## **Certain Wild Plants May Give Birds’ Immune System a Boost**

The scientists also found that males eat more of the two medicinal plants tested than females, particularly in April, their mating season. So, it’s thought the plants may offer not only antiparasitic and antifungal effects but also reproductive benefits.

“In theory, both sexes of great bustards might benefit from seeking out medicinal plants in the mating season when sexually transmitted diseases are common — while males that use plants with compounds active against diseases might appear more healthy, vigorous, and attractive to females,” said Gonzalez-Coloma.<sup>6</sup>

However, due to great bustards’ unique mating process, which is so elaborate it’s thought to take an immune system toll on the males, it’s likely the medicinal plants may be used for their immune-boosting properties as well.

“Bustards perform some of the most unusual and spectacular breeding displays in the animal kingdom,” the Eurasian Bustard Alliance explains. “Most bustard species participate in a ‘lek’ breeding system, in which males gather to perform displays that involve contortion of the body, inflation of air sacs, twirling, jumping, or running. Females observe the males and choose with which to mate.”<sup>7</sup>

The featured study scientists suggested the consumption of strategically chosen wild plants may help offset some of the physical effects of this strenuous ritual:<sup>8</sup>

*“Why could males be more interested in this plant than females and why during the mating season? Courtship is strenuous for males in most polygynous species and particularly in great bustard males, who show the most strongly skewed mating success reported among lekking birds, suggesting an extreme intensity of sexual selection in this species.*

*Males develop costly ornaments every spring and perform exhausting displays to attract females. It is known that physiological investment in sexually selected characters competes with investment in immune response.”*

## **How Do Birds Know Which Plants Are Good for Them?**

While the researchers believe that male bustards seek out and consume the two plants because of the immunological stress brought on by courtship, it’s unknown how the birds know which plants to choose for this purpose.

It's been suggested that animals may learn to associate improved health with a certain bitter taste, while another possibility is that some form of chemical communication may occur between medicinal plants and the wild birds that consume them.<sup>9</sup>

Further research is needed to uncover whether great bustards really are self-medicating with medicinal plants and insects but, the scientists explained, "[T]hese studies will represent a difficult, if not impossible, task with great bustards due to legal restrictions on their capture and handling, and the stress they undergo in enclosures."<sup>10</sup>

Study author Luis M. Bautista-Sopelana, with the National Museum of Natural Sciences in Madrid, added that their data show great bustards prefer to eat plants with antiparasitic effects, but proving this is a challenge. "We can't compare between control and experimental treatments. And double-blind trials or dose-effect studies, obligatory steps in human or veterinary medicine, are obviously impossible in wild animals."<sup>11</sup>

Animal self-medication, or zoopharmacognosy, occurs widely in the animal kingdom. Click here to watch my interview on the subject with primatologist **Dr. Michael Huffman**, and my **interview with Caroline Ingraham** about applied zoopharmacognosy for pets.

## Sources and References

<sup>1,4,5,8,9,10</sup> [Front. Ecol. Evol., 23 November 2022](#)

<sup>2,3,6,11</sup> [EurekAlert! November 23, 2022](#)

<sup>7</sup> [Eurasian Bustard Alliance, What are bustards? \(Archived\)](#).

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