

## This bird protects its eggs with a bacterial secretion

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Hoopoe (*Upupa epops*). Credit: Thinkstock

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**Chuck Bednar** for redOrbit.com – Your Universe Online

Think helicopter parents take extreme measures to protect their offspring? Think again.

Researchers from the University of Granada, along with along with colleagues from the Higher Council of Scientific Research (CSIC), have discovered the hoopoe (*Upupa epops*) coats its eggs with a bacterial secretion. The question was: Why, though?

The study authors concluded that the secretion must provide some type of barrier to prevent microbial pathogens from reaching the embryo in the egg's interior. So far, female hoopoes are the only species in which this mechanism has been detected, they explained in a [statement](#).

Manuel Martín-Vivaldi, a zoology professor at the university, analyzed the secretions with his team and found that it contained enterococci bacteria that produced small antimicrobial proteins known as bacteriocins. The more enterococci they found in the eggshells, the higher the odds were that the hoopoe offspring would successfully hatch.

Scientists have confirmed that the components of the hoopoe's uropygial gland are different from other birds. This is largely due to the bacteria present in the gland. The new study has revealed that this type of bird also has a unique feature in its eggs – several small depressions which do not completely penetrate the shell, and whose purpose appears to be the retention of the mother's bacterial secretion.

“With this experiment, we have been able to establish that if the females can use their secretion, towards the end of the incubation period, those tiny craters are full of a substance saturated with bacteria. If we preclude the use of this secretion, these tiny craters appear empty towards the end of the hatching process,” explained Martín-Vivaldi.

The findings, he added, also indicate that the reproductive strategy of this particular type of bird “had evolved hand in hand with the use of bacteria which may be beneficial for the production of antimicrobial substances, which they cultivate in their gland and then apply upon eggs which are particularly endowed to retain them.”

The researchers are currently attempting to determine the specific composition of the bacteria contained within the uropygial gland as well as which types of antimicrobial compounds synthesize these microbes. Future studies on this topic could help scientists better understand the interaction between animals and beneficial bacteria function, and this could lead to the discovery of new antimicrobial substances that could be used as medicine or to preserve food.

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