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# Antimicrobial resistances in wildlife: insights from a Mediterranean biodiversity hotspot, the Camargue (Southern France).

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## Abstract

Antimicrobial resistance spread is of major concern for human health and associated with growing economical issues. While it is increasingly hypothesized that wildlife could play an important role in antimicrobial resistant bacteria dynamics, empirical data remain scarce at the moment. As an introduction we will present the elements of response that literature can bring concerning four questions: i) Which resistant bacteria are frequently observed in wildlife? ii) How are resistant bacteria exchanged between wildlife and the other compartments involved? iii) In which habitats are those resistant bacteria found? iv) Are resistances associated with some ecological traits of the host?

In a second part we will present the first results of our project aimed at characterizing the antimicrobial resistant bacteria carried by gulls in the Camargue and understanding their dynamics. We collected cloacal swabs from two gull species: Yellow-legged gulls (*Larus michahellis*) that live in close contact with humans and Slender-billed gulls (*Chroicocephalus genei*) that feed at sea. Following culture on selective media we isolated carbapenem resistant *Escherichia coli* and *Vibrio cholerae* strains as well as cephalosporin resistant *Proteus mirabilis* strains. We will discuss these results in the light of gull ecology and of the genetic comparison between the strains we identified and those that were isolated from humans in the study region.

Our results are alarming enough to warrant the investigation of the contamination source of the bacteria we identified. They also demonstrate that wildlife cannot be neglected if we are to meet the challenge of antimicrobial resistance control.

**Keywords:** Antimicrobial resistance, Gulls, *Escherichia coli*, *Vibrio cholerae*, *Proteus mirabilis*

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