

**Title** Bactericidal effect of saffron (*Crocus sativus* L.) on *Salmonella enterica* during storage

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#### **Abstract**

The presence of pathogenic bacteria in spices represents a public health risk as a possible cause of food contamination. *Salmonella* has been found in several spices and it has been involved in food-borne outbreaks, but this bacterium has not been reported as a contaminant of saffron (*Crocus sativus* L.). We examined a possible antibacterial effect of saffron using samples from Iran, Greece and Spain which were artificially contaminated with clinical isolates belonging to five different serovars of *Salmonella*. We detected a loss of viability during the room-temperature storage of the saffron samples, with bacteria being undetectable at day 16 except in the case of the DT104 strain of the Typhimurium serovar, in all of the samples, and of the Hadar serovar in the Iranian sample, both of which gave negative culture at day 32. The laboratory strain LT2 of the Typhimurium serovar was undetectable at day 4. To gain an insight into the basis for this bactericidal effect, we measured the inhibitory and bactericidal concentrations of safranal and crocin, the main compounds responsible for the flavouring and colouring capabilities of saffron. They were in the order of 8–16 mg/mL and 64–128 mg/mL for safranal and crocin, respectively. These data suggest that these compounds, and probably their chemical relatives, are involved in the antibacterial activity of saffron, and that this effect can significantly reduce the risk of food contamination with *Salmonella* by this spice.