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## ANTIMICROBIAL ACTIVITY OF *Capsicum* EXTRACTS AGAINST SOME PATHOGENIC BACTERIA

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Food-borne diseases are important worldwide, since the increase of international trade of commodities and food products has raised the risk of dispersion of pathogenic bacteria, from production sites to far away places of consumption.

On the other hand, consumers demand safer foods, containing less chemicals, which make us consider the study of natural antimicrobials (Beuchat and Golden, 1989). Serruti and Alzamora in 1996 showed that vanillin (one of the capsaicin analogues) inhibits the growth of yeast. López-Malo et. al. (1998) observed the same effect when using moulds. Also Kim and Ryeon (1979) reported antibacterial effects of capsaicin from Korean hot peppers on *Bacillus subtilis*, *Bacillus cereus*, and *Sarcina lutea*. Given the above, the purpose of the present work was to know whether three *Capsicum* extracts had an inhibitory effect on four pathogenic bacteria, and then to validate such effects on an actual food, in this case the food being minced beef meat.

Extracts from habanero, serrano, and pimiento peppers were prepared. 20 µL of each extract were placed on sterile filter paper disks and set on plates containing the bacteria, then incubated at 37°C for 48 h.

The *Capsicum* extracts inhibited the growth of *Listeria monocytogenes*, *Staphylococcus aureus*, *Salmonella typhimurium* and *Bacillus cereus*.

The pimiento extract showed a stronger antibacterial activity than the serrano extract, and this one in turn was stronger than the habanero.

Challenge tests were performed for *Salmonella's* growth in minced beef meat added with pimiento extract. Strain of *S. typhimurium* (ATCC 14028) was obtained from the culture collection of the Microbiology Department, ENCB-IPN, Mexico City and maintained at 4°C in Mueller-Hinton agar. The identity of the strain was confirmed. Post-rigor lean beef muscles were obtained from a local market in Mexico City. Each piece was immersed in boiling water for 3 min in order to reduce the microorganisms attached to the surface of the muscle. The bacterium was inoculated into the meat previously mixed with different concentrations of the extract. The concentrations were: 0.02, 0.06, 0.1, 0.3, 0.5, 0.75, 1, 1.25, 1.5, and 2.5 mL/100g of beef. Then the samples were stored at 7°C for 7 days. The combined effect of the *Capsicum* extract and sodium chloride on the bacterial growth was also evaluated. The minimum inhibitory concentration of the extract required to prevent the growth of *S. typhimurium* in minced beef was 1.5 mL/100 g of meat. The addition of 1, 2, 3 and 4% w/w of sodium chloride did not have any additional inhibitory effect on *Salmonella*.

The results obtained from this study support the idea of proposing the use of *Capsicum annuum* extract as a natural antibacterial agent in a food such as raw beef, which is often contaminated.

## LITERATURE CITED

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