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Antimicrobial effects of capsaicinoids and lecithin on the growth of food borne pathogenic bacteria

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Antimicrobial effects of various *Capsicum* varieties have been attributed to several molecules including capsaicin, m-coumaric acid and trans-cinnamic acid. Lecithin however has been overlooked as a potential bacterial growth inhibitor either alone or in combination with hydrophobic molecules such as capsaicin. The objectives of this research were to evaluate the presence of lecithin, capsaicin, m-coumaric acid and trans-cinnamic acid in three pepper varieties and to evaluate the antibacterial effects of pepper extracts and synthetic molecules (alone and in combination) on six food borne pathogenic bacteria. The presence of proposed antimicrobial molecules was evaluated by thin layer chromatography. The direct drop plate method was used to evaluate the antimicrobial effects of the three pepper extracts (Bell Pepper, *Capsicum annuum*; Jalapeno, *Capsicum annuum*; Habanero, *Capsicum chinense*) and synthetic and/or extracted molecules (trans-cinnamic acid, m-coumaric acid, capsaicin and lecithin). The six pathogenic bacteria used were *Bacillus cereus* ATCC 56926, *Enterobacter aerogenes* ATCC 13048, *Escherichia coli* ATCC 25922, *Listeria monocytogenes* HPB#43, *Staphylococcus aureus* ATCC 25923 and *Salmonella typhimurium*. Lecithin was found in all three pepper varieties, while capsaicin was present in only Jalapeno and Habanero. Trans-cinnamic acid and m-coumaric acid were present in Bell pepper and Jalapeno pepper only. The extract of Bell pepper had antibacterial effects on all six bacteria tested. *L. monocytogenes* resisted Jalapeno and Habanero extracts while *B. cereus* resisted the Habanero extract only. Lecithin (synthetic and extracted), trans-cinnamic acid (synthetic) and m-coumaric acid all inhibited growth of the six bacteria tested. Capsaicin did not have any antibacterial effects, alone or in combination with lecithin. Antibacterial effects of peppers could not be attributed to capsaicin, trans-cinnamic acid or m-coumaric acid since pepper extracts lacking these molecules were antibacterial. This study proposes that lecithin is responsible for the antibacterial effects demonstrated in this study.

Biography

Etienne Dako has completed his PhD and MSc in Food Microbiology at Laval University in Quebec, Canada. He holds two Certificates in Genetics of Populations and Organic Chemistry, and a MSc degree in biochemistry from the Université d'Abidjan in Côte d'Ivoire. He is also involved in several universities as associate and researcher, including: Université Nangui Abrogoua (Côte d'Ivoire) and Senghor University in Alexandria (Egypt). He was the president of the committee of graduate student in his department over 11 years. He is, since 2007, the president of Animal Care Committee of University of Moncton and member of Academic Senate (since 2006). He has presented numerous seminars and conferences on his research, and published over forty articles in scientific journals. He was nominated last year and this year as a member of Canadian delegates for Codex Committee on Food Labelling (CCFL), Joint FAO/WHO food standards programme. He also served as a delegate and chairman respectively at the first Global Food security in Rabat (Marocco) and AGRAR-2013: 1st conference of African research on agriculture, food, and nutrition in Yamossokoro (Côte d'Ivoire).

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