Prevalence of Arcobacter species in meat

ThesisPresented

By

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Summary

The present studyreavealed the prevalence of *Arcobacter*spp. in 200samples of meat, including100 poultry meat (50 thighs and 50 breasts), 50 fresh meat and 50 minced meat that were collected from retail shops throughout Assiut City.

Arcobacterwas recovered from 8 % of fresh chicken breast and could be isolated from chicken thigh in a percentage of 14%. The identified species were *A.butzleri*which could be isolated only from 2 % of chicken breast samples and 4 % of chicken thigh samples;*A. cryaerophilus* with a percent of 2 % chicken breast samples and 6 % of chicken thigh samples and*A. skirrowii* which could be isolated from4 % of each chicken breast and chicken thigh samples.

In case of fresh meat samples *Arcobacter* spp. isolates represented 4 %. The recovered isolates were *A. cryaerophilus*with a percentage of 2% and *A. skirrowii*in a ratio of 2% also, but *A.butzleri*failed to be isolated from fresh meat samples.

Regarding to minced meat samples, *Arcobacter* spp. were recorded in in 6% of the examined samples. In addition, *A.butzleri* and *A. cryaerophilus*were isolated from the positive samples in incidences of 2 % for each. While, *A.skirrowii*was not detected in the examined minced meat samples.

The biochemically identified *A. butzleri*strains were subjected to confirmation by using PCR and the results were compatible with the biochemical identification.

In the present study, PCR was carried out for screening of some putative virulence genes in the isolated *A. butzleri* strains. The obtained data revealed that the detected genes were tlyA and cadF andirgA.

The antibiotic sensitivity test for *Arcobacter*spp.showed that the resistance of *Arcobacter*spp. isolates against Penicillin G and Cephalothin was found to be 100% followed byOxacillin and Sulphamethoxazol(93.7% each), Erythromycin(81.3%) and Ampicillin (75%). Besides, resistance to Nalidixic acid (68.8%), Ciprofloxacin (62.5%), Cefotaxime (50%), Amikacin (37.5%) and

Enrofloxacin (31.3%) was evident whereasa low percentage of *Arcobacter*spp. isolates demonstrated resistance to Doxycycline (18.8%), Gentamicin and Tetracycline (6.3% each).

An experimental study was conducted to investigate the antimicrobial activity of Cinnamon, Rosemary and Thyme EOin growth media and in minced meat (food model).

The investigation revealed that within the tested antimicrobials; the cinnamon essential oil (EO) was the most efficient against tested *A.butzleri* strain in growth media. The cells were killed by a concentration of 0.5 %. The minimum inhibitory concentration (MIC) of cinnamon EO was 0.25%. Regarding rosemary and thyme EO, MIC was 2 % and 0.5%, respectively. While, the MLC was 4% and 1% for rosemary and thyme EO, respectively.

The essential oil which had the best inhibitory effects against *A.butzleri* in the laboratory medium and in-vitro study, should be chosen and tested for the food model study (in vivo) by using minced meat which inoculated with adjusted initial inoculum of the pathogen (1 x 10^7cfu/g) and stored at 4ºC for 24 hr. The obtained results showed that cinnamon EO (0.5 and 1%) has highest inhibitory effect against *A.butzleri* after the 24hr of storage with reductionrate of (99 and 99.98%), respectively. Thesensory evaluation of minced meat treated with these levels showed that the sensory attributes of treated minced beef samples during cold storage (4ºC) were improved by using different concentrations of cinnamonEO.compared to the control samples during the storage period.

The public health significance of the isolated *A.butzleri* was discussed and the suggestive measures to protect the consumers were outlined.