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Rapid detection and identification of poultry *Salmonella* serotypes using multiplex PCR assay

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Abstract

Recently, rapid multiplex PCR assay has been used widely worldwide to identify and screen *Salmonella* and their most important serovars in the poultry industry without the need of the serological examination. This study designed to determine different *Salmonella* serotypes that isolated from chicken using multiplex PCR assay. Layer and broiler chicken internal organs including: liver, bile, spleen, heart, yolk sac, ceca, joint, ovary and oviduct were used to isolate *Salmonella sp*. Sixty (60) *Salmonella* isolates were subjected to amplification of *inv*A gene (invasion gene) for *Salmonellae sp.*; *fli*C gene (flageller filament protein) for *Salmonella typhimurium* and *sef*A gene (fimberial gene) for *Salmonella enteritidis* and *Salmonella gallinerum – pullorum*. Each primer pairs was optimize individually to ensure that each amplicon had the correct size. Then, Salmonella isolates passed to amplification by use three sets of primers *inv*A, *fli*C and *sef*A simultaneously in order to detect the genus *Salmonella* and their types in single reaction tube. The results of this study showed that all *Salmonella* isolates were positive for *inv*A gene amplified sequence. Moreover, the serotypes of *Salmonella typhimurium* and *Salmonella enteritidis* were identified by the presence of the specific amplified products to *fli*C gene for *S. typhimurium* and *sef*A gene for *S. enteritidis* and *Salmonella gallinerum-pullorum*. In conclusion, this study approved that applying multiplex PCR assay revealed the same sensitivity and specificity of uniplex PCR. Moreover, this technique was easy, reliable and save time and cost. The authors recommend to implement the combination between, routine multiplex PCR test and traditional culture methods to approach the effective and more accurate profile for the prevalence of *Salmonella* in flocks of poultry in Iraq.

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