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Clinical and Molecular Phylogenetic Detection of *Trueperella pyogenes* in Abscessed-wounds of Cattle

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ABSTRACT

Background: Abscessed wounds in cattle represent a significant veterinary concern, often leading considerable economic losses due to decreased productivity, treatment cost, potential culling and even death. This study aims to investigate the incidence rate of *Trueperella pyogenes* in abscessed wounds of cattle using molecular technique with phylogenetic analysis of study isolates and estimation the relationship of infection to animal risk factors.

Methods: A total of 271 cattle of different ages and sexes admitted to private veterinarian clinics or being visited to their farms in Wasit province (Iraq) were diagnosed clinically with abscessed wounds. Then, samples of abscess swab were collected and examined molecularly by the conventional PCR. Finally, the positive *T. pyogenes* isolates were sequenced, submitted in the NCBI database and analysed phylogenetically.

Result: Findings of clinical examination revealed a significant increase in abscessed wounds at abdomen but decreased in neck and back when compared to other body regions; head, forelimbs, hindlimbs and pelvis. Targeting of *16S rRNA* gene, 7.38% from abscessed wounds of study cattle were positively infected with *T. pyogenes*. Phylogenetic analysis of the study *T. pyogenes* isolates revealed its identity to NCBI-BLAST USA *T. pyogenes* isolate (KX592206.1) at rates of similarity and mutation/changes ranged 98.47-99.86% and 0.0003-0.001%, respectively. Relation to risk factors, incidence and risk of positivity in body parts were elevated significantly in abdomen but decreased in neck and back, head, forelimbs and hindlimbs when compared to pelvis. Concerning age, although insignificant variation in incidence of positivity was seen among age groups of study animals, cattle aged 1-4 years and >4 years were appeared at higher risk of infection than those of <1 year. For sex, also insignificant differences in incidence rate of positivity was detected between females and males; however, females were detected at higher risk of infection than males.

Key words: Bovine bacterial infections, National centers for biotechnology center (NCBI), Polymerase chain reaction (PCR), Risk factors, Skin injury.

INTRODUCTION

The complexity of wound healing in cattle as in other terrestrial vertebrates involves intricate biological processes influenced by both animal-related factors in addition to nutrition and husbandry practices which play a critical role in facilitating optimal wound healing in cattle; while conversely, disruptions and infections can impair and complicate it (Lux, 2022; Singh *et al*., 2024). Bacterial pathogens represent the main cause of wound infections which result mostly in various clinical forms that ranged from localized abscesses and folliculitis to more diffuse cellulitis, each presenting unique challenges in diagnosis and management following the prevalence and specific types of bacteria responsible for these purulent conditions that varied geographically and depending on the farm-specific hygiene practices (Malone and Schultz, 2022; Mohammad *et al*., 2022; Al-Eodawee *et al*., 2024). *Trueperella pyogenes* consider one of the most neglected opportunistic pathogens which found usually in mucous membranes and skin of various animals including cattle, pigs and other livestock (Rzewuska *et al*., 2019). This bacterium can lead to purulent infections in lung, udder, genital tract, liver and

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