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ADHESION OF BOVINE URINARY CORYNEBACTERIA TO THE EPITHELIAL CELLS OF VARIOUS PARTS OF THE BOVINE URINARY TRACT, AND SURVIVAL OF THE BACTERIA IN SOIL

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Adhesion of Corynebacterium renale and C. pilosum to the epithelial cells of various parts of the bovine urinary tract—the vulva, the vaginal vestibule, the urethra, the urinary bladder, the ureter and the renal pelvis (the renal calyx)—was examined. Non-piliated (P−) and piliated (P+) clones of C. pilosum were selected, and the adhesive function of the pili of C. pilosum was also examined.

Adhesion of C. renale and C. pilosum was most efficient to the epithelial cells of the vulva. Of the epithelial cells the vulva, the cornified cells lacking the nucleus bound more bacteria than those with the indistinct nucleus and the non-cornified cells, indicating that the adhesion was most effective to the most aged cells. Marked adhesion of C. renale and C. pilosum to the epithelial cells of the vulva suggests that the vulva is the best target tissue for these bacteria, and that the vulva, which is situated the open end of the urinary tract, may play an important role as the portal of entry of bovine urinary corynebacteria.

The number of P+ bacteria of C. pilosum which adhered to the epithelial cells of various parts of the bovine urinary tract was larger than that of P− bacteria of C. pilosum, which adhered to these cells. By the anti-whole cell antiserum, the adhesion of P+ bacteria of C. pilosum to the epithelial cells of the vulva and the uroepithelial cells was inhibited more effectively than by the anti-pilus antiserum. The adhesion of P− bacteria of C. pilosum to these cells was also effectively inhibited by the anti-whole cell antiserum. These findings indicate that the adhesion of C. pilosum is mainly dependent on the pili, and then on the other surface components such as the cell wall.

Survival of 3 strains of C. renale, C. pilosum and C. cystitidis in the soil was examined. C. pilosum survived longer, for at least 22 weeks, than C. renale and C. cystitidis, which survived for several weeks. This finding and the fact that C. pilosum adhered best to the epithelial cells of the vulva suggest the life cycle of this bacteria in a field. C. pilosum, which is parasitic on the vaginal vestibule of apparently healthy cows, is excreted in the soil with urine, survives and has the opportunity to adhere again to the epithelial cells of the bovine vulva.