

## Speciation of Bacteria Isolated from Clinical Canine and Feline Urine Samples by Using ChromID CPS Elite Agar: A Preliminary Study

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**Abstract :** Urinary tract infection (UTI) is a common disease affecting dogs and cats in both community and hospital environment. Bacteria is the most frequent agent isolated, fewer than 1% of infections are due to parasitic, fungal, or viral agents. Common symptoms and laboratory abnormalities include abdominal pain, pyrexia, renomegaly, and neutrophilia with left shift. A rapid and precise identification of the bacterial agent is still a challenge in veterinarian laboratories. Therefore, this cross-sectional study aims to describe bacterial colony patterns of urine samples by using chromID™ CPS® Elite Agar (BioMérieux, France) from canine and feline specimens submitted to a veterinary laboratory in Portugal (INNO Veterinary Laboratory, Braga) from January to March 2022. All urine samples were cultivated in CPS Elite Agar with calibrated 1 µL inoculating loop and incubated at 37°C for 18-24h. Color, size, and shape (regular or irregular outline) were recorded for all samples. All colonies were classified as Gram-negative or Gram-positive bacteria using Gram stain (PREVI® Color BioMérieux, France) and determined if they were pure colonies. Identification of bacteria species was performed using GP and GN cards in Vitek 2® Compact (BioMérieux, France). A total of 256/1003 submitted urine samples presented bacterial growth, from which 172 isolates were included in this study. The sample's population included 111 dogs (n=45 males and n=66 females) and 61 cats (n=35 males and n=26 females). The most frequent isolated bacteria was *Escherichia coli* (44,7%), followed by *Proteus mirabilis* (13,4%). All *Escherichia coli* isolates presented red to burgundy colonies, a colony diameter between 2 to 6 mm, and regular or irregular outlines. Similarly, 100% of *Proteus mirabilis* isolates were dark yellow colonies with a diffuse pigment and the same size and shape as *Escherichia coli*. White and pink pale colonies were *Staphylococcus* species exclusively and *S. pseudintermedius* was the most frequent (8,2 %). Cyan to blue colonies were mostly *Enterococcus* spp. (8,2%) and *Streptococcus* spp. (4,6%). Beige to brown colonies were *Pseudomonas aeruginosa* (2,9%) and *Citrobacter* spp. (1,2%). *Klebsiella* spp., *Serratia* spp. and *Enterobacter* spp were green colonies. All Gram-positive isolates were 1 to 2 mm diameter long and had a regular outline, meanwhile, Gram-negative rods presented variable patterns. This results showed that the prevalence of *E. coli* and *P. mirabilis* as uropathogenic agents follows the same trends in Europe as previously described in other studies. Both agents presented a particular color pattern in CPS Elite Agar to identify them without needing complementary tests. No other bacteria genus could be correlated strongly to a specific color pattern, and similar results have been observed in studies using human's samples. Chromogenic media shows a great advantage for common urine bacteria isolation than traditional COS, McConkey, and CLED Agar mediums in a routine context, especially when mixed fermentative Gram-negative agents grow simultaneously. In addition, CPS Elite Agar is versatile for Artificial Intelligent Reading Plates Systems. Routine veterinarian laboratories could use CPS Elite Agar for a rapid screening for bacteria identification, mainly *E. coli* and *P. mirabilis*, saving 6h to 10h of automatized identification.

**Keywords :** cats, CPS elite agar, dogs, urine pathogens

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