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 includeabdominal 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® EliteAgar (BioMérieux, France) from canine and feline specimens submitted to a veterinary laboratory in Portugal (INNO Veterinary Laboratory, Braga)from January to March2022. 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 bacteriausing Gram stain (PREVI® Color BioMérieux, France) and determined if they were pure colonies. Identification of bacteria species was performed using GP and GN cards inVitek 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 wasEscherichia 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 where Staphylococcus species exclusively and S. pseudintermedius was the most frequent (8,2 %). Cian to blue colonies were mostly Enterococcusspp. (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 theprevalence 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 instudies using human's samples. Chromogenic media shows a great advantage for common urine bacteria isolation than traditional COS, McConkey, and CLEDAgar 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, mainlyE coli and P.mirabilis, saving 6h to 10h of automatized identification.

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

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