Evaluation of the chromID® CPS® Elite media for bovine mastitis diagnosis

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OBJECTIVE
- Rapid isolation and identification of pathogens is a major goal of diagnostic microbiology. In order to isolate and identify bacteria involved in mastitis, 5% sheep blood agar culture plates are often employed. In this study, our objective was to compare the performance of chromID® CPS® Elite with 5% sheep blood culture media. The chromID® CPS® Elite agar is a non-selective media, consisting of a rich nutritive base combining different peptones and chromogenic substrates which enable the detection of specific enzyme activities.
- The detection of indole is enhanced by the tryptophan present in the agar. This chromID® CPS® Elite agar has been developed as an isolation, enumeration and identification media for human urine specimens and allows the direct identification of Escherichia coli and the presumptive identification of the following bacterial species or genera – Enterococcus, Klebsiella, Enterobacter, Serratia, Citrobacter (KESC).
- Our aim was to evaluate this chromogenic media for veterinary application and in particular for bovine mastitis diagnosis.

METHODS
- 69 milk samples were received by the Rhône Departmental Veterinary laboratory (Vetagro Sup) for routine microbiological analyses. After homogenization, these clinical samples considered to be infected were simultaneously plated onto Columbia agar with 5% sheep blood (COS media) and chromID® CPS® Elite media using a 10µl sample and a loop.
- Close-knot perpendicular streaks over the whole surface of the plate were made, after initial streaking of the plate radius. A BHI (brain-heart infusion) broth media was also inoculated in parallel, to be used in case no growth was observed on the plates after 24 hours. The plates were incubated at 35°C ±2°C in aerobic conditions. The cultures were examined after 18-24 hours of incubation.
- Bacterial growth was observed, and the aspect of the colonies was reported. For the chromID® CPS® Elite media the colours of the colonies were also reported.
- The identification method was the same for the 2 media and performed directly from the inoculated media. An orientation test was done with a gram colouration, catalase and oxidase tests. Identification of the microorganisms isolated was done by additional tests including the coagulase test, API®20E™, API®20NE and API®20 Strep tests (bioMérieux).

RESULTS
- Inoculation of the plates from the BHI media was done for 18/69 milk samples. 10/69 were sterile (no growth) on the 2 media and on the BHI. 3/62 were polycontaminated (>2 bacterial species on the plate). In this case bacterial identification was not performed. For 52/69 milk samples one bacterial species was identified and for 4/69, 2 bacterial species were identified. The number of isolations and identifications were identical for the 2 media.
- Observation of bi – and polycontaminated milk samples was more evident with the chromID® CPS® Elite media than with classical COS media because of the colony colouration.
- The chromID® CPS® Elite media allowed the growth and direct identification in 9/69 samples infected with E. coli, via burgundy coloured colonies as defined by the manufacturer’s package insert.
- See table 1 : the prevalence of the different identified colonies is coherent with that described in the literature. (RESAPATH, Ansès, bilan 2014)
- 8/69 samples were identified as Streptococcus uiberis and showed a blue colour , 15/69 were identified as Staphylococcus coagulase negative or Staphylococcus coagulase positive and showed a white/yellow colour and 6/69 were identified as Serratia marcescens and showed blue to green colonies.
- Among the bacteria identified on a single occasion were Enterobacter cloacae, Streptococcus dysgalactiae, Pseudomonas fluorescens, Enterococcus faecium, Aerococcus viridans and Arcanobacterium haemolyticum.

CONCLUSIONS
- ChromID® CPS® Elite media was efficient in our study for the detection and identification of bacteria from milk coming from bovine mastitis cases.
- Several advantages in using chromID® CPS® Elite media were observed.
- A better distinction could be made between colonies, allowing the easy detection of polycontaminated and bi-contaminated milk samples.
- As recommended by the manufacturers, burgundy colonies could be identified as Escherichia coli without needing further analysis.
- The use of chromID® CPS® Elite media and the colouration of the colonies allows time saving through the reduction in the number of confirmation tests required for Escherichia coli. Further experience with the media may lead us to perform identification directly, sparing the need to carry out orientation tests, for the blue to green colour of the colonies of the KESC group.
- The gain in time for a veterinary laboratory enables susceptibility testing to be started earlier. These benefits at the laboratory level have an important impact on the speed of reporting results and hence the rapid establishment of a specific and appropriate treatment which is essential in cases of bovine mastitis and in the context of the fight against antibiotic resistance.