# Colibrí™ : a new automatic system for colony picking and MALDI-TOF targets preparation

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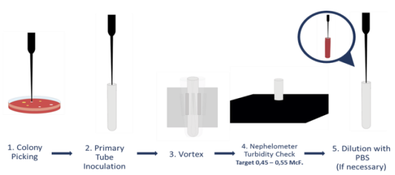
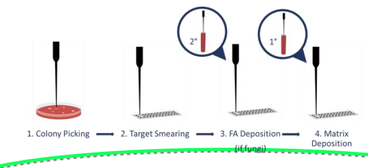
## INTRODUTION

Rapid identification by MALDI-TOF mass spectrometry was an important innovation in Microbiology, providing with a timely information about the microorganism causing infection. The new system Colibrí™ (COPAN ITALIA, Brescia, Italy) can prepare target for MALDI-TOF in an automatic way. The aim of our study was to compare the identification results obtained by both automated and traditional MALDI-TOF target preparation.

## *COLIBRì ™ : OVERVIEW OF THE ACTIVITES*



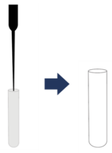

Microbial suspension for **susceptibility tests**



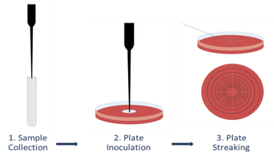

Preparation of the target for **identification**


**Colibrì™ can automatically**:

- perform target MALDI
- prepare microbial suspension 0,5 McF
- prepare microbial suspension for different automatic systems AST
- perform disk diffusion susceptibility test
- create a subculture plate

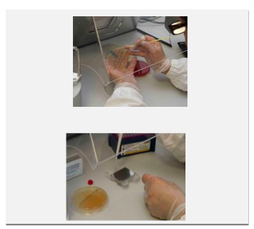


Transfer of an aliquot to **secondary tubes**

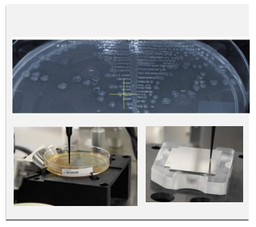



**Purity plate** preparation

## *METHODS, MICROORGANISMS TESTED and RESULTS*



**MANUAL**
MALDI-TOF target preparation



**AUTOMATED**
MALDI-TOF target preparation

**23 GRAM POSITIVE BACTERIA**:
*8 Enterococcus spp.*
*8 S.aureus*
*7 CNS*

→ **82,6 %** (19/23) AGREEMENT

**33 GRAM NEGATIVE BACTERIA**:
*12 E.coli*
*9 K.pneumoniae*
*4 P.aeruginosa*
*3 A.baumannii*
*2 P.mirabilis*
*1 Enterobacter spp*
*1 S.marcescens*
*1 C.koserii*

→ **96,9 %** (32/33) AGREEMENT

**2 YEAST**:
*1 C.albicans*
*1 C.parapsilosis*

→ **100 %** (2/2) AGREEMENT

**OVERALL AGREEMENT 91,4% (53/58)**

| BACTERIA (5/58) | Identification *TRADITIONAL* | Identification *COLIBRI'* |
|---|---|---|
| *S.epidermidis* | *S.epidermidis* | not reliable |
| *S.epidermidis* | *S.epidermidis* | not reliable |
| *S.epidermidis* | *S.epidermidis* | no peaks found |
| *E.faecium* | *E.faecium* | not reliable |
| *P.mirabilis* | *P.mirabilis* | no peaks found |

These differences could be due to small size of the colonies on agar plates and to the transfer of one colony on the Colibrí ™ 's target

## METHODS

Colibri™ is equipped with a pipetting system for the transfer and manipulation of colonies grown on different kind of solid media (blood agar, Mac Conkey, Chocolate Agar, Chromogenic media). This instrument is able to pick the colony and transfer it on the target. A total of 58 positive cultures with isolated colonies from clinical samples were analysed at the Microbiology Laboratory of Niguarda Hospital, Milan, Italy. Samples were seeded on solid media by WASP™ and were incubated in the WASPLAB™. The colonies from each plate were used to prepare the target according to the routine procedure used in our Laboratory. Results were compared with those obtained on target prepared by Colibrí™. Microorganism identification was performed by Matrix Assisted Laser Desorption Ionization – Time of Flight (MALDI-TOF, Bruker Daltonics).

## RESULTS

The manual and automatic method were compared for 8 *Staphylococcus aureus*, 8 Enterococcus spp., 7 Coagulase Negative Staphylococci, 26 *Enterobacteriaceae* (12 *Escherichia coli,* 9 *Klebsiella pneumoniae,* 1 Enterobacter spp., 1 *Serratia marcescens*, 1 *Citrobacter koserii* and 2 *Proteus mirabilis*), 7 non-fermenting Gram-negative bacteria (3 *Acinetobacter baumannii* and 4 *Pseudomonas aeruginosa*) and 2 yeast (1 *Candida albicans* and *1 C. parapsilosis*). An overall agreement of 91,4% (53/58) was reported when compared with the routine method. In particular, a 96,9% (32/33) agreement was obtained for Gram-negative bacteria and a 100 % for yeasts (2/2). An overall agreement of 82,6% (19/23) was obtained for Gram-positive bacteria. Three *S. epidemidis* (two "not reliable identification" and one "no peaks found"), 1 *E. faecium* ("not reliable identification") and one *P. mirabilis* ("no peaks found") were not identified on the Colibrí™'s target. These differences could be due to small size of the colonies on agar plates and to the transfer of one colony on the Colibrí ™ 's target.

## CONCLUSION

Our results demonstrate good performance of Colibrì™. The version now available allows to spot multiple colonies on the same position for better results also on small colonies. This innovative system can be connected to the Wasplab™ (COPAN ITALIA, Brescia, Italy) to receive all the instructions about the activities to be performed on each media plate with complete traceability of the sample. It could reduce the hands-on time for the laboratory operator, maintaining the quality of work and improving the safety. Moreover, Colibrì ™could contribute at the full automation of Microbiology Laboratories.