

Final project report:
Quantification of the antimicrobial potential of fabrics with copper on strains of methicillin-resistant positive *Staphylococcus coagulase* isolated from dogs

Presentation

As requested by Mr. Adolfo Momares, an experimental trial was conducted to quantify the bactericidal capacity of fabrics added with copper of Copptech's technology produced by Kimba Textile Group on strains of *Staphylococcus* spp., according to the Spanish standard UNE in ISO 20743 (ISO 20743: 2013) for the determination of the bacterial activity of textile products, in the Laboratory of Veterinary Clinical Microbiology, of the Facultad de Ciencias Veterinarias y Pecuarias de la Universidad de Chile (LM- FAVET).

Materials and methods

For this, and following the guidelines of the aforementioned standard, *Staphylococcus aureus* ATCC 6538, WDCM code was used as control strain.

On the other hand, the clinical isolates used to be challenged with the different fabrics corresponded to:

- 12 methicillin-resistant coagulase positive *Staphylococcus* (CPS) strains.
- 4 coagulase positive *Staphylococcus* (CPS) multi-resistant and resistant to methicillin strains.
- 10 coagulase positive *Staphylococcus* (CPS) multi-resistant and sensitive to methicillin strains.

Total: 26 strains.

These strains were included, considering the impact on animal health and public health that methicillin resistant *Staphylococcus* represent; and the great therapeutic difficulty that multi-resistant strains represent.

Of these strains, 20 corresponded to *S. pseudointermedius*, 1 to *S. aureus*, and 3 strains cataloged as *Staphylococcus* spp.

It is important to note that these strains were obtained from healthy dogs and dogs with dermatopathies, which were subsequently isolated and characterized by the LM-FAVET.

The analyses were carried out between April and June of 2019, and were performed without knowing the percentage of copper that the different fabrics contained to avoid biases when making the quantifications.

Thus, two types of woven fabrics were tested, each with a different percentage of copper in its conformation, in which the Absorption Method was used as a form of bacterial inoculation. Additionally, a non-woven fabric test was performed using the Transfer Method.

As a method of bacterial quantification, the Colony Count Method was used, and the results expressed as indicated in the standard used.

Results

The results obtained are expressed below as a percentage of reduction in the three fabrics tested:

1.- Woven fabric 1 (lower cooper percentage).

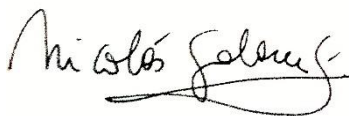
Strains	Average Reduction %	
	0 hours	24 hours
Methicillin resistant CPS	30	57.8
Multi-resistant and resistant to methicillin CPS	22.1	49.2
Multi-resistant and sensitive to methicillin CPS	24.3	52.9

2.- Woven fabric 2 (higher cooper percentage).

Strains	Average Reduction %	
	0 hours	24 hours
Methicillin resistant CPS	35.6	78.2
Multi-resistant and resistant to methicillin CPS	20.9	68.3
Multi-resistant and sensitive to methicillin CPS	25.3	71.7

3.- Non-woven fabric

Strains	Average Reduction %	
	0 hours	24 hours
Methicillin resistant CPS	77.6	99.9
Multi-resistant and resistant to methicillin CPS	50.2	96.3
Multi-resistant and sensitive to methicillin CPS	53.3	99.9



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