Biodiversity of Coagulase-Negative Staphylococci in French cheeses, dry fermented sausages, processing environments and clinical samples.

Emmanuel Coton\textsuperscript{a}, Marie-Hélène Desmonts\textsuperscript{b}, Sabine Leroy\textsuperscript{f}, Monika Coton\textsuperscript{a}, Emmanuel Jamet\textsuperscript{d}, Souad Christians\textsuperscript{d}, Pierre-Yves Donnio\textsuperscript{e}, Isabelle Lebert\textsuperscript{f} and Régine Talon\textsuperscript{f}

\textsuperscript{a} ADRIA Normandie, Boulevard du 13 juin 1944, 14310 Villers-Bocage, France
\textsuperscript{b} Aérial, rue Laurent Friess 67400 Illkirch, France
\textsuperscript{c} ACTILAIT, 419, route des Champs Laitiers 74800 La Roche sur Foron, France
\textsuperscript{d} ADIV, ZAC Parc Industriel des Gravanches 10, rue Jacqueline Auriol 63039 Clermont-Ferrand, France
\textsuperscript{e} UPRES-EA 1254 Microbiologie, Université Rennes 1 35043 Rennes, France
\textsuperscript{f} INRA, UR 454 Microbiologie, F-63122 Saint-Genès-Champanelle, France

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\textbf{Abstract}

In this study, the biodiversity of Coagulase-Negative Staphylococci (CNS) strains isolated in France from cheese related samples (227 isolates) and dry sausage related samples (204 isolates) was compared to the biodiversity of 297 clinical isolates. Species identification was performed using different molecular methods (specific PCR, “Staph array” hybridization and \textit{sodA} gene sequencing). Infraspecific biodiversity of strains belonging to the main CNS species found in both food and clinical samples was then assessed by pulse-field gel electrophoresis (PFGE). For food-related samples, the main species encountered corresponded to \textit{Staphylococcus equorum} (28.5\%), \textit{S. xylosus} (28.3\%), \textit{S. saprophyticus} (12.5\%) and \textit{S. succinus} (7.7\%); while, for clinical isolates, the main species encountered corresponded to \textit{S. epidermidis} (69.4\%), \textit{S. capitis} (9.8\%), \textit{S. hominis} (4.5\%), \textit{S. warneri} (4.5\%) and \textit{S. haemolyticus} (3.8\%). The two main species common to both food and clinical samples corresponded to \textit{S. epidermidis} and \textit{S. saprophyticus}. Concerning infraspecific biodiversity, PFGE profiles of \textit{S. equorum}, \textit{S. saprophyticus} and \textit{S. epidermidis} showed a large genomic biodiversity. Comparatively, \textit{S. xylosus} exhibited a lower biodiversity. No correlation could be observed between PFGE patterns and either the geographical origin or the sample type. This study highlighted that no food strains had similar PFGE profiles to clinical ones and that the two main food-related species, \textit{S. equorum} and \textit{S. xylosus}, were not found in clinical samples. The identification of CNS species and the characterisation of the genetic diversity of the strains constitute a first step towards CNS safety assessment.

\textbf{Keywords}: Coagulase-Negative \textit{Staphylococcus}, Biodiversity, PFGE, Cheese, Dry, sausage, Clinical samples