Abstract
The surface coverage of certain dry fermented sausages such as Italian salami by some species of Penicillium provides their characteristic flavor and other beneficial properties. One of them is the protective effect by means of a uniform film of white mold against undesirable microorganisms. The aim of this work was to identify and to isolate the fungal species present in mature Italian type of salami and to evaluate if it is possible to obtain some of them as starters. In addition, the effects of temperature (14 °C and 25 °C), water activity (a_w) (0.90, 0.95 and 0.995) and 2.5 % sodium chloride (NaCl) on fungal growth were determined. Similarly, the proteolytic and lipolytic activity and the ability to produce toxic secondary metabolites were evaluated in order to characterize some possible starter strain. All species found belong to the genus Penicillium, including a performing starter as Penicillium nalgiovense and some potentially toxicogenic species. All the strains showed a higher growth rate at 25 °C. The production of extracellular proteases and lipases was significantly higher at 25 °C than at 14 °C with and without sodium chloride. Only Penicillium expansum produced patulin. On the other hand, Penicillium griseofulvum was the only species that produced cycloliazonic acid but none of the strains produced penicillin. The species present on salami, Penicillium nalgiovense, Penicillium minioluteum, Penicillium brevicompactum and Penicillium puberulum were unable to produce any of the evaluated toxins. These findings suggest that some fungal isolates from the surface of salami such as P. nalgiovense are potentially useful as starters in sausage manufacture.

Keywords
Water activity, Proteases, Lipases, Mycotoxins, Fermented meat products