Sardinian EVOO as sink of microbial biodiversity

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Over the last 15 years, microbiological research has established that freshly produced virgin olive oils have a rich microflora. Yeasts and bacteria are capable of conditioning the physicochemical and sensorial characteristics of the oil through their high enzymatic activities (Zullo et al, 2019). The presence of these microbes, (Santona et al., 2018), possibly arises from their transfer into the oil from the olive carposphere during the extraction process. The microorganisms in olive oil are often below the limits of detection with standard culture methods due to the strong selective pressure exerted by the oil's antimicrobial compounds and the fact that the oil's fatty acids constitute the sole source of carbon and energy for any microbial contaminates. A wealth of literature now indicates the presence of a highly specific microflora, especially in relation to yeasts (Zullo et al., 2020), by contrast, very limited data exist about the presence of bacteria. Recently, a work of Santona et al. (2018) described the presence of different genera and species of bacteria in extra virgin olive oils that were at least one year old. More Recently, the bacterial diversity of 15 extra virgin olive oils, obtained from different Italian varieties, including Frantoio, Coratina, Bosana, and Semidana, was analyzed and about 51 isolates, representative of 36 clusters, led to the identification of *Bacillus spp., Brevibacillus spp., Micrococcus spp., Staphylococcus spp., Pantoea spp., Kocuria spp., Lysinbacillus spp., and Lactobacillus spp*., most of which reported for first time in olive oils Fancello et al., (2020). The results obtained underline that microbial diversity of extra virgin olive oils represents an unexpected sink of microbial diversity. On the one hand, some of the species found show an interesting biotechnological potential for industrial bioconversion of lipids, fats, and oils into high-value products and as plant growth-promoting rhizobacteria, chemical fertilizer substitutes, for their potential ability to detoxify industrial or agro-industrial byproducts, but also have a probiotic potential that may be explored in view of the possible probiotic utilization of some extra virgin olive oils. On the other hand, most of the isolates showed different patterns of antibiotic resistance, thus posing safety issues on the possible biotechnological exploitation of this microbial biodiversity.

References

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