Isolation and Screening of Beneficial Microbes Associated with the Grapevine, Vitis vinifera

Gleeson, Dara

Although the grapevine, Vitis vinifera, is the most commonly cultivated grape species, there is little known regarding the species of microbes found in the surrounding soil or their possible effect on the plant and wine varieties. It is hypothesized that microbes associated with different tissues and regions of the crop could influence the organoleptic properties of grapes and impact the flavor and development of a specific wine. The regional variation in grape-and-wine quality characteristics is a critical feature of the terroir, with consequences for consumer preference and economic appreciation. This study was conducted to identify the microbes located in different regions of the grapevine soil and to determine if possessed beneficial to the growth of the crop. When isolated colonies were identified, the microbes were tested for beneficial hormones (such as indole-acectic acid-IAA) and siderophoresindicating interactions between the plant and soil microbes. Gram staining procedures provided further taxonomy information. Microbial isolates were identified through PCR, gel electrophoresis and sequencing of the 16S rRNA gene. The results demonstrated that the 15 microorganisms identified through isolation were most similar to endophytes that live within a plant for at least part of its life cycle without causing apparent disease. Similar endosymbionts are found in lavender, dates and wheat crops. The most common genera (Acidovorax, Variovorax, and Streptomyces) are related to several interesting plant-associated microbes that often promote plant growth and protection from harmful pathogens or contaminants.