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South African Grape and Wine Research Institute
Suid-Afrikaanse Wingerd-en-Wyn
Navorsingsinstituut

POSTGRADUATE OPPORTUNITY AVAILABLE AT THE SOUTH AFRICAN GRAPE AND WINE RESEARCH INSTITUTE (SAGWRI) FOR 2023

The following project is available for a MSc/PhD-level study from 2022, for a suitable student with microbiology background.

Project Title: Exploring the potential of yeasts and bacteria to reduce smoke taint in wine

Project description: With climate change, and the increasing frequency of wildfires in the South African winelands, smoke taint has also become a more regular problem in South African wines. Beyond the direct, devastating damage to property, harvests and wildlife, the smoke generated by these fires also causes indirect economic losses to the wine industry which may amount to millions of rands. Most wildfires occur during the summer dry season, when the grapes ripen. Grapes exposed to smoke arising from surrounding fires absorb volatile phenols that get glycosylated (i.e. chemically bound to simple sugars) within the grapes. Upon grape harvest and crushing, these glycosidically-bound phenols are not volatile and therefore cannot be detected through their aroma. Yeasts and bacteria involved in the fermentation of grape juice to wine may cleave off the sugar moieties and release volatile compounds, thereby conferring to wine what is referred to as smoke taint. This taint manifests itself through smokey, meaty, ashy and burnt characters on the nose and palate of the wine. Depending on the intensity of this smokey characters, wines may be rejected by consumer, leading to serious economic losses. Few investigations have been conducted as to the potential of different wine yeasts to release these compounds. This project will therefore endeavour to screen wine yeasts and bacteria for their ability to release free volatile phenols, using a combination of microbiology, analytical chemistry and sensory techniques. It will enhance our knowledge of wine yeast species, especially with regard to their glycosidase activities that are poorly characterized, and guide winemakers as to which yeast species to avoid when dealing with smoke-affected grapes. The project can accommodate one PhD and one MSc student.

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