

Capabilities of Bacterial and Yeast Isolate

Daying Wen*

Department of Wine Science, the University of Adelaide, Glen Osmond, Australia

*Corresponding author: Daying Wen, Department of Wine Science, The University of Adelaide, Glen Osmond, Australia, E-mail: dayiwen@gmail.com

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Description

At some point in their lives, endophytes are organisms that live in plant organs. They are able to colonize inside plant tissues without causing harm to the host. The endophytes may have laid out this relationship with their host during their advancement. Dimeric anthrone, phenols, benzopyranone, terpenoids, palmarumycins, furandiones, and other secondary metabolites are all produced by endophytes. Taxol is one of the well-known medicines used to treat cancer today. It was first discovered in the endophytes of *Taxus brevifolia*, also known as the Yew tree. Endophytes not only contain anticancer agents, but they are also a major source of new and useful metabolites. The discovery of these useful metabolites, which come from endophytes like *Aspergillus*, *Fusarium*, *Acremonium*, and *Penicillium*, has been reported. We examined the powerful biological activities of endophytes isolated from *Camellia oleifera* Abel in this study. Tea oil, or *C.oleifera* Abel, is a member of the *Camellia* family. It is widespread throughout the northern portion of South East Asia and the southern portion of China. Chemical components from several parts of *C. oleifera* Abel were isolated from previous research. Numerous antioxidants and antimicrobial agents were found in the *C. oleifera* Abel seed, according to research on its chemical compounds. Unsaturated fatty acids account for 82%–84% of these compounds, and sesamin, saponin, and 2,5-bis-benzo[1,3]dioxol 5-yl-tetrahydro-furo[3,4-d][1,3]-dioxine are among the other compounds that have been identified. Also, the saponin subordinates found in endlessly seed cake of *C.oleifera* Abel showed fascinating organic exercises like antibacterial, antifungal, and anticancer exercises. From past examinations, *C.oleifera* Abel is a decent wellspring of bioactive specialists. However, there aren't many studies on *C. oleifera* Abel's endophytes.

Isolation of Endophytic Fungi

We discovered a number of endophytes in various parts of *C. oleifera* Abel as a result of this study. However, a specific endophyte (Tea2-L1) that was later identified as *Penicillium* sp. was shown to be a potent extract in terms of antioxidant capacity and cytotoxic activities on cancer cell lines. The ascomycetous genus, which plays a significant role in the environment, includes the *Penicillium* species. Some members of this genus are responsible for the production of important

and well-known chemicals like penicillin. This significant antimicrobial specialist, was found in a *Penicillium* sp. in 1928 by Alexander Fleming. The outcomes from this work would give important data to the revelation of new restorative specialists later on. In May 2018, *Dracaena* leaf litter was gathered from Thailand's Songkhla Province. Plastic bags were used to transport the collected samples to the laboratory. A stereomicroscope (Motic SMZ-171) was used to examine the specimens. On potato dextrose agar (PDA) plates, mycelia or spore masses from specimens were directly isolated and incubated at 25–30°C. New PDA plates were used to put the culture. Morphological characteristics such as color, colony, and texture were recorded after the cultures were grown for two to four weeks. A Nikon ECLIPSE Ni compound microscope and a Canon EOS 600D digital camera were used to take pictures of the characteristics of the culture. The widest and longest segments of each morphological structure were used to take measurements. More than 20 measurements were taken whenever possible. The Tarosoft (R) Image Frame Work program was used to measure the lengths and widths, and Adobe Photoshop CS6 Extended v. 10.0 (Adobe Systems, USA) was used to process the images used in the figures.

Identification of Fungal Isolates

The amplification reactions were carried out using 25 l of sterile H₂O, 12.5 l of Easy Taq PCR Super Mix (a mixture of Easy Taq TM DNA Polymerase, dNTPs, and optimized buffer from Beijing Trans Gen Biotech Co., Chaoyang District, Beijing, PR China), 1 l of each forward and reverse primer (10 pM), and 2 l of DNA template (1.2 g/ml) The initial PCR thermal cycle for the ITS and TEF1-gene amplification was 94°C for 3 minutes, followed by 35 cycles of 94°C denaturation for 30 seconds, 55°C annealing for 50 seconds, 72°C elongation for 90 seconds, and 72°C extension for 10 minutes. Initial denaturation at 95°C for 30 seconds, annealing at 53°C for 30 seconds, elongation at 72°C for 45 seconds, and final extension at 72°C for 90 seconds comprise the TUB2 gene amplification thermal cycle program for PCR. The PCR products were sent to Sangon Biotech in Shanghai, China, for sequencing. Using the programs SpadeR and iNEXT, the entire dataset was analyzed for diversity patterns. In view of an improved on variant of the ACOR scale, the dispersion of records was separated in two gatherings (plentiful and uncommon) and the inclusion shown by the information inside

each gathering was determined. To accomplish this, extended versions of the "abundant" and "rare" categories were created by dividing the entire dataset according to the 1.5% threshold that is typically applied to the "common" and "occasional" categories. Based on the structure of the partial sub-datasets, this method allowed for an estimate of the potential number of species not yet recorded in the dataset. The Chao 1 bias-corrected indicator was also used to estimate the expected species richness and the dataset's percent completeness. A figure like this could be used in future comparisons, despite the dataset's extreme heterogeneity. The relationship between the number of records and the total number of species was used to

create a rarefaction curve to examine the potential impact of doubling the collection effort. Likewise, a Slope number-based variety profile was made to contrast the considered dataset and distributed results from Costa Rica. The axis y is multiscale, but it is referred to as "diversity," and it can also be used to display survey completeness at the various q values. This type of profile is useful for visually assessing some characteristics of a biological community, such as species richness and evenness/dominance in one figure. Costa Rica is perhaps the only other region where the myxomycetes have been studied sufficiently to permit a straightforward comparison to be meaningful, despite the fact that the spatial scale of that comparison is significantly different.