UPTOSPEED Express Updates

SCIENTIQUIPP

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DNA EXTRACTION FROM PLANTS
FOR DISEASE ANALYSIS

Indian agriculture is considered a global powerhouse. It is the second largest producer of Rice, Wheat, Sugar Cane, Fruits, Vegetables, Cotton and Tea. In India the Agriculture sector employs around 60% of the population and contributes about 17% of the total GDP. One of the major constraints Indian agriculture faces is its low yield, which is 30-35% lower than those of developing countries. The challenges stagnating agriculture productivity in India include outbreaks of pests and disease, poor soil fertility, unavailability of sufficient water and climate change. Among all the factors, plant pathogens especially fungal pathogens are of key concern, and they are a major yield-limiting factor in agriculture.

The FAO (Food and Agriculture Organization) of the United Nations estimates that more than 30% of world agricultural production is lost annually due to plant pathogens (fungi, bacteria and viruses) and pests, entailing consequences to the food supply. In order to detect diseases that affect plants, molecular methods involving nucleic acid amplification are widely used. ***These methods comprise three main steps: Nucleic acid extraction and purification; Amplification; and finally, Detection.***

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The Method

The method for DNA extraction and purification involves approximately 100mg of homogenate of the plant to be analyzed is lysed, using various lysis buffers. The lysed sample is deposited in an extraction column attached to a 2ml capacity collection tube and the DNA is isolated from the rest of the molecules. The steps of adding different reagents (wash buffers and elution buffer) are alternated with steps of centrifugation at 11,000G for 1 or 2 minutes.

The final result of this process involves an elution containing the DNA of the plant of interest, The isolated DNA is amplified using various techniques, the most used being Polymerarse chain reaction (PCR) and its variants such as RT-PCR. The last step in the disease identification process is the detection and quantification of amplicons for which techniques such as qPCR are used.

Disease that affect plants are responsible for large economic losses in the agriculture industry that ultimately affect global food security. It is therefore crucial to analyse them.

Recommended Centrifuge:



Product – Rota 4R V/FM

ROTA 4R V/FM
(Refrigerated Centrifuge)
PART NO: Part No 100114

ROTOR L24x1.5mL
PART NO: 200142

ROTOR: L6x50mL
PART NO: 200151

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About Scientiquipp. Pvt.Ltd.

Since the 1980's Scientiquipp (formerly known as Plasto Crafts) has been synonymous with customer-oriented processes and innovative products, such as laboratory devices. Today, we serve as experts and advisors, using our unique knowledge and experience to support laboratories and research institutions around India. The foundation of the company's expertise is its focus on its customers. Scientiquipp's exchange of ideas with its customers results in comprehensive solutions that in turn become industry standards. Scientiquipp will continue this path in the future, to the standard set by the company's founders: that of *enabling the future of medicine.*

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Scientiquipp Private Limited
C/101, Shanti Industrial Premises,
Tambe Nagar, S N Road,
Mulund West, Mumbai 400080.
+919769431680 | scientiquipp@gmail.com

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