

Scientists find common genes defending coffee plants against devastating disease



The Arabica coffee plant. Credit: NTU Singapore

Arabica coffee is the most economically important coffee globally and accounts for 60% of coffee products worldwide. But the plants it hails from are vulnerable to a disease that, in the 1800s, devastated Sri Lanka's coffee empire.

Now, an international team of researchers co-led by Nanyang Technological University, Singapore (NTU Singapore) has made a breakthrough that helps protect Arabica plants (*Coffea arabica*) against the fungal disease, called coffee leaf rust.

The other co-leads of the study, published in *Nature Genetics*, are based at the world's largest food and beverage company Nestlé, the Université de Montpellier in France and the University at Buffalo in the United States.

The scientists mapped out, in great detail, all the genetic material—or genomes—of Arabica and two related coffee plants. This allowed the team to identify a new combination of genes shared by the plants that are resistant to coffee leaf rust. With the data on the genomes, other useful traits in coffee plants can also be identified.

Discovering the resistance genes opens the way to better protect coffee lovers' daily fix and maintain their drink's high-quality taste, thereby supporting an industry employing millions of workers. According to the International Coffee Organization, the livelihoods of 125 million people around the world depend on the coffee business.

Coffee leaf rust disease has wreaked havoc on coffee-producing nations and continues to wipe out coffee farms today. The United States Agency for International Development estimated that between 2012 and 2014, an outbreak of coffee leaf rust caused about US\$1 billion (S\$1.36 billion) in economic damages in Latin America.

Assistant Professor Jarkko Salojärvi from NTU's School of Biological Sciences, who co-led the research team, said, "The high-quality genome sequences of the three plant species, together with the candidate genetic sequences for coffee leaf rust resistance, form the cornerstone for breeding new...

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