

Scientists claim citrus originated in Australasia

October 1 2007

Scientists at the Centre for Plant and Food Science at the University of Western Sydney have questioned the long-established perception that citrus originated in Southeast Asia. They believe it may have originated closer to home - in Australia, New Caledonia and New Guinea.

Australian Professor David Mabberley, an eminent botanist from the University of Washington and an adjunct professor at UWS, and Professor Andrew Beattie from the Centre for Plant and Food Science, suggest that the earliest species of citrus could have been dispersed from north-eastern Australasia as 'floating fruit' on westward-flowing equatorial currents, about 30 million years ago.

"Conventional wisdom holds that citrus evolved in Southeast Asia but this is based on ignorance about what constitutes a true species, the relationships between plants in Asia and Australasia, and how the two landmasses were related prior to the discovery of plate tectonics in the 1960s," says Professor Mabberley, who is also Soest Professor and Director of the Botanic Gardens in Washington.

Until recently only limited research has been undertaken to counter the view that citrus originated in Asia. However, Professors Mabberley and Beattie, and others including Professor Randy Bayer now at the University of Memphis, have shed new light on citrus origins following extensive research on classification of plants and the evolution and dispersal of the species.

"There are about 25 true species of citrus and some fifty per cent of these are from Papua New Guinea, New Caledonia and Australia. While most commercial species and cultivars such as mandarins, oranges and lemons, originated in Asia," Professor Mabberley says.

Professor Mabberley says that recent molecular studies have helped to resolve gaps in the evolution and domestication of citrus.

"These studies indicate that the closest relatives to the citron, *Citrus medica* - long-considered to have originated in India and one of the parents of the lemon - are species from New Ireland in Papua New Guinea and others from New Caledonia," Professor Mabberley says.

Professor Beattie says correct identification of species and varieties of citrus and where they originated is a fundamental aspect of biosecurity for the Australian citrus industry and for current research at UWS on a devastating disease of citrus known as huanglongbing.

Huanglongbing, also called citrus greening, has had a devastating impact on citrus production in Asia since early last century.

"It is not present in Australia but is nearby in Papua New Guinea and is, after its recent introduction to Florida in the US and Brazil, a major threat to the very survival of the citrus industries of these countries," Professor Beattie says.

"It is the greatest threat to the viability of the Australian citrus industry that I know of."

Professor Mabberley says our capacity to minimise the impact of citrus greening requires a very sound knowledge of the plants affected and their suitability as hosts of the disease and its two known insect vectors - one from Africa, the other from Asia.

"At this point our capacity is gravely limited by surprisingly poor naming of the plants; with about a thousand scientific names in use - often with many names referring to the same plant - there is considerable confusion that inhibits our ability to fight the disease."

While accurate identification of plants is needed to address the threat of disease, it is also essential for the conservation of rare and threatened plant species.

Source: University of Western Sydney

Citation: Scientists claim citrus originated in Australasia (2007, October 1) retrieved 29 March 2023 from <https://phys.org/news/2007-10-scientists-citrus-australasia.html>

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