

# Rubbish heaps helped crops evolve

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Leucaena, a Mexican tree that produces edible seeds.

Rubbish heaps and backyard gardens helped early farmers domesticate crop plants, according to Oxford University scientists. Their research confirms that seeds and fruits gathered in the wild and then discarded or planted at home created a ‘backyard melting pot’ that gave rise to novel hybrids. Ancient people were quick to spot useful hybrids and start growing them as crops as the first village farms were established, around 4,000 years ago.

‘It is an old idea that many crop varieties could have arisen partly by accident – what you might call the “treasure in the trash syndrome” – but our research has dug up some of the first hard evidence that this actually

happened,’ said Dr Colin Hughes of the Department of Plant Sciences, lead author of a report on the research published in this week’s PNAS.

The scientists studied *Leucaena*, a Mexican tree that produces edible seeds. Their botanical surveys and genetic analysis of the different species of *Leucaena* revealed a complex evolutionary history in which hybrids played a vital role. The scientists believe that many of these hybrids may have evolved as ‘happy accidents’.

‘What is important about *Leucaena* is that we think it evolved in a similar way to other Mexican crops such as the *Opuntia* cactus, grown for its fruit and as a vegetable, and agave – which is grown to make tequila and mezcal, as well as for its fibres.’ said Dr Hughes. ‘Our research sheds light on how accidental, as well as intentional, early cultivation and spontaneous hybridization may have played a role in the domestication of many other crops from around the world, everything from citrus to potatoes and bananas.’

Crucially this process can be seen still going on today in places such as Mexico where the scientists talked to villagers and farmers who, through discarding seed pods from plants (as well as intentional planting), had spawned new *Leucaena* hybrids in their backyards just as their ancestors must have done.

Dr Hughes commented: ‘We know that ancient people were very knowledgeable about the qualities of fruits and seeds and they would have been keen to exploit anything new that appeared that had advantages over wild varieties, whether it was cultivated intentionally or not.’

A report of the research entitled ‘Serendipitous backyard hybridization and the origin of crops’ is published online at PNAS.

Source: University of Oxford

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