

Big Mac: The whole world on your plate

A burger and fries may be the quintessential North American meal but it can also be viewed as the perfect example of humanity's increasingly varied diet, according to researchers who have conducted a unique study of the plants used around the world for food.

In the first-ever study of the “phylogenetic distribution” of the human diet, University of Calgary plant evolutionary ecologist Jana Vamosi, working with a team led by Serban Proches from Stellenbosch University in South Africa, found that humans likely stand alone when it comes to the spectrum of species we consume. Our ability to process food combined with an insatiable hunger for new tastes and international trade systems has also led to food becoming the ultimate product of a globalized society.

“Generally speaking, we eat very broadly from the tree of life,” Vamosi said. “Others have looked at the sheer number of plant species we consume but nobody has ever examined whether the plants we eat are clustered in certain branches. It turns out that they are not.”

In a paper published in the current issue of the scientific journal *BioScience*, the researchers examined more than 7,000 plant species commonly eaten by people to determine the origins and evolutionary relationships of the various plants that comprise humankind's menu. In addition to confirming the incredible number of species that are regularly eaten, they found that we chow down on members of a remarkably high number of plant families known to biology.

As a case study, the scientists analyzed the ingredients of a simple fast food meal – a McDonald's Big Mac, French fries and a cup of coffee – to illustrate how the average human diet in developed nations is more diverse than ever before. From potatoes that were first domesticated in South America to mustard that was developed in India, onions and wheat that originated in the Middle East and coffee from Ethiopia, they found the meal contained approximately 20 different species and ingredients that originated around the world (see attached Backgrounder). This leads to the conclusion that “a Big Mac is an apt symbol of globalization.”

“That a single meal contains about 20 species is impressive, given that some human societies – those that are largely unaffected by current globalization trend – commonly include only 50 to 100 plant species in their entire diet,” the paper states.

Vamosi says the study raises myriad questions about the diversity and nutritional aspects of the human diet that will be the subject of future investigations.

“Certainly, including many fruits and vegetables in your diet is something that has been encouraged by nutritionists for some time. However eating carrots and celery, for example, provides you with nutrients from the same plant family, as do apples, pears, apricots, peaches, raspberries and blackberries. Indeed broccoli, kale and cauliflower are actually a single species,” Vamosi said.

“Eating lots of different produce might not actually provide you with a phylogenetically diverse diet, and whether that's important for providing maximum nutritional value remains to be seen.”

The study also argues that steps to protect the diversity of human food plants may have to be taken as globalization and industrial-scale agriculture gradually leads to more uniform diets for the world's population overall.

“Individually we are probably eating a greater range of plant species than our ancestors, but the loss of indigenous knowledge and regional cuisines may mean that as a species our diet is becoming increasing

focussed on a few plant species, and indeed a few varieties of those species” states coauthor John Wilson.

“The fact that we do eat so broadly indicates that we enjoy many different flavours and combinations of flavours and also indicates that many plants that we don't eat likely have some sort of culinary value that we just haven't discovered yet,” Vamosi said. “Maintaining plant diversity ensures that we will continue to have the current flavours that we enjoy available to us and will also preserve other potential food sources into the future.”

Source: University of Calgary

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