Another reason to drink a nice cup of shade-grown joe

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A new study published in the December 23rd issue of *Current Biology*, a Cell Press publication, reveals another "eco-friendly" reason to select shade-grown coffee over beans that were grown in the sun: Shade coffee farms not only harbor a diverse array of birds and bats, but they also help to maintain the genetic diversity of native tree species.

"Shade coffee farms allow birds and bats to move and disperse seeds throughout the coffee landscape, promoting plant gene flow," said Shalene Jha of the University of Michigan. "This is unlike most agricultural systems, which do not provide habitat for seed dispersers, and thus limit the distance plant seeds can move. By supporting important seed dispersal processes, shade coffee farms maintain plant population gene flow across fragmented habitats."

Gene flow refers to the transfer of genes from one population to another by interbreeding. The maintenance of gene flow is an important conservation measure since fragmented populations are effectively smaller and therefore more susceptible to inbreeding and further declines or extinction.

Coffee is grown across millions of hectares of land within the world's richest centers of biodiversity, the researchers said. In tropical America, that coffee is traditionally grown under a diverse canopy of shade trees, which supports a broad spectrum of pollinators that increases coffee yield. Unlike sun coffee grown in monoculture, shade coffee also provides habitat to a wide array of other animals, including bats and

migratory birds that aid farmers by picking off insects. Earlier studies had suggested that birds and other animals within shade coffee farms might have additional ecological benefits.

Now, the researchers have confirmed that notion through genetic analyses revealing recent colonization and extensive gene flow of native understory tree species in shade coffee farms of Chiapas, Mexico. The findings show that traditional coffee farms can maintain genetic connectivity with adjacent forest and serve as a focal point for forest regeneration.

Jha said they hope the discovery calls attention to the value of maintaining biodiverse agricultural systems more generally.

"More than 60% of the earth's surface is managed by humans as agriculture or pasture, and these landscapes provide us with a great opportunity to support native biodiversity," Jha said. "Many studies have shown that conserving native biodiversity in agricultural systems can actually benefit crops—by preventing pest outbreaks and providing native pollinator services. Our study shows that agricultural crops can also benefit native trees living across the landscape."

Buying shade-grown coffee is one way to support the conservation of biodiversity in agricultural landscapes at a global scale, she said. At the local level, Jha added, consumers can also support local farming practices that conserve native biodiversity, such as pesticide-free farming, polyculture farms, and urban gardening.

Source: Cell Press