

## **Pathways to Asian Civilizations: Tracing the Ecological and Cultural Niches of Rice in Asia**

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Rice is a highly diverse crop, diverse in ecological adaptations, genetics and cultural understandings. That diversity is the product of a complex history of coevolution with a range of varied cultures across southern and eastern Asia. This paper provides an overview of inferences from modern genetics, ecology and archaeology about the origins, spread and diversification of rice crops and their cultural associations. Some consideration of the varied, and contradictory, hypotheses linking rice and language spreads is also made. Rice origins remain obscure but we are able to constrain the most likely geographies and cultural ecologies of early rice exploitation, as rice came to be managed or cultivated in hunter-gatherer economies in the early and middle Holocene of the Ganges and Yangtze basins. Recent archaeobotanical advances have improved our ability to track the evolution of the domestication syndrome, especially non-shattering and larger grains, with inferences about habit and habitat. The end of the protracted domestication process and the emergence of agricultural dependence took place around 6500-6000 years ago in China and about two millennia later in India, when hybridization with Chinese rice likely played a role. Once these developed rice agricultures were established, farming populations grew and expanded by migration and incorporation of pre-existing populations and some more selective cases of adoption throughout eastern Asia, Southeast Asia and peninsular India and Sri Lanka. The rice expansions, which can be summarized as a series of 11 “thrusts”, were more or less complete around 2000 years ago. This same period undoubtedly witnessed much of the spread and diversification in Asian language families too. During this process rice diversified into different cultural niches with traits such as stickiness, fragrance, and color, which reinforced deep and ancient patterns of cultural diversity within Asia—between northeast and southwest, between China and Southeast Asia. Thus, as one of the best studied crops rice is representative of the coevolutionary mosaic of domestication.