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# Ecospaces occupied by Homo erectus and Homo sapiens in insular Southeast Asia in the Pleistocene

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Hominins migrated to the islands of the Sunda Shelf multiple times. At least two immigration events are evident, an early immigration of Homo erectus in the late Early Pleistocene and a second immigration of Homo sapiens during the Late Pleistocene. Regional environments changed considerably in the Pleistocene. Expansion patterns among hominins are at least co-determined by their ecologies and environmental change. We examine these expansion patterns on the basis of habitat reconstructions. Mammalian communities provide a geographically extensive record and permit to assess hominin ecospaces. Although chronological resolution is low, they represent the most complete record of habitat changes associated with hominin expansion patterns.

In order to reconstruct and compare hominin ecospaces on a quantitative scale, we set up a reference sample consisting of mammalian communities of 117 national parks in South Asia and Sub-Saharan Africa. The diversity of such communities is assessed by ecological profiling of specialized herbivore taxa. Moreover, datasets on climate and vegetation correlate with the diversity structure of such specialized herbivore communities.

Reconstructing the diversity structure of communities at key sites in Pleistocene Southeast Asia permits to infer features of the climatic and vegetation framework associated with different hominin taxa. Our results show that Homo erectus and Homo sapiens did not occupy similar ecospaces. The ecospace of Homo erectus is characterized by comparatively low diversity among frugivorous and folivorous taxa, while obligate grazers are part of the assemblages. Specialized herbivore communities with such a diversity structure occur at present in East Africa, while they are absent in Southeast Asia. In the reference sample, this type of ecospace corresponds to seasonal wetlands. Although Homo sapiens still inhabits this type of environment in Southeast Asia, his ecospace is wider. Homo sapiens is associated with specialized herbivore communities dominated by frugivorous and folivorous taxa. Specialized herbivore communities with such a diversity structure occur at present in rainforests on the Sunda Shelf.