Phylogeny and Biogeography of *Apodemus*

Nelish Pradhan [1], Charles W. Kilpatrick [1], Priya Joshi [2], Ajay N. Sharma [2] and Saurav Chhetri [3]

[1] University of Vermont, Burlington, VT 05405 USA
[2] Center for Molecular Dynamics - Nepal, Kathmandu, Nepal
[3] American Community School, Amman, Jordan

Species of the genus *Apodemus* are widely distributed throughout the broadleaf forests in temperate zones of Eurasia and are among the oldest extant lineages of murid rodents. Examination of chromosomal rearrangements, allozymic and DNA sequence data has resulted in the placement of the taxa of *Apodemus* into four groups (*Apodemus*, *Sylvaemus*, *Argenteus*, and *Gurkha*). However, the phylogenetic relationships among the four lineages are not fully resolved. This study used concatenated sequences of three mitochondrial and five nuclear genes to construct a phylogeny in parsimony, likelihood and Bayesian frameworks for seventeen species of *Apodemus* with all four major lineages represented. Additional cytochrome b sequences were obtained from 29 specimens of *A. gurkha* collected from 3 localities to expand sampling for the monotypic *Gurkha* group. Considerable polymorphism was observed with the detection of 19 cytochrome b haplotypes as well as geographic variation among the 3 localities sampled. The phylogenic analyses suggest two distinct lineages within the genus rather than four, with *Argenteus* being the basal taxon in the *Apodemus* clade and *Gurkha* being the basal taxon in the S*ylvaemus* clade. The four groups of *Apodemus* diverged between 6.5 and 9.2 million years ago which coincides with global climactic changes that resulted in change in vegetation across Eurasia and rapid uplift of the Himalayas that occurred in the late Miocene and early Pliocene.