Population genetic structure of Asian Snakehead Fish (Channa striata) in North Borneo: implications for conservation of local freshwater biodiversity

ABSTRACT

This study quantified the intra-specific diversity and characterized the populationstructure of the Asian snakehead fish, Channa striata in Sabah, North Borneo bydetermining the variability at six microsatellite loci. Range of genetic diversity acrossall sampled populations was comparatively moderate in relation to levels reported forC. striata populations occurring elsewhere and the overall Sabah population is highlystructured, reflecting isolations across geological and ecological time scales. Tworeciprocally monophyletic genodemes were identified along the west and east coastthat may have been separated by mountain upthrusts throughout the central region ofSabah. Despite kinship among populations within each genodeme, individual demeswere discrete as indicated by significant genotypic differentiation (all $P < 0.0014$)and low estimates of gene flow between them that likely reflect natural fragmentationof freshwater habitats they occupy. Our findings underline the potential of molecularmarkers in delimiting and delineating geospatial units of conservation in Sabah. Lowlandfreshwater ecosystems in the area may comprise two geographically isolatedecoregions, in which each hypothetically harbours biota that have evolved allopatrically.Additionally, identification of biodiversity hotspots within these putative ecoregionscan be greatly facilitated with genetic-level investigations as the rate by whichfreshwater communities are inventoried has been extremely slow in most habitats.