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### **Central and eastern chimpanzees are characterized by clinal genetic variation**

Formation of genetically distinct subspecies may occur if populations of the same species become geographically isolated. Within common chimpanzees (*Pan troglodytes*) four geographically-defined subspecies are distinguished: the western (*P.t.verus*), the nigerian-cameroonian (*P.t.elliotti*), the central (*P.t.troglodytes*) and the eastern (*P.t.schweinfurthii*) chimpanzees. However, genetic studies have not consistently found that central and eastern chimpanzees form monophyletic clades as might be expected for distinct subspecies. Contrary to most previous studies, we used microsatellite genotypes derived from fecal samples from wild individuals with known origins to examine the pattern of genetic variation across the range of central and eastern chimpanzees. We genotyped 185 central chimpanzees from across large parts of their range and combined these data with 283 eastern chimpanzee genotypes taken from the literature. We found that samples collected further apart were more differentiated, so that variation across central and eastern chimpanzees fits a pattern of

isolation by distance. Moreover, groups sampled from the same subspecies frequently showed higher genetic differentiation than the least differentiated pair of groups taken from different subspecies. That proportion decreased markedly when we simulated a clumped sampling scheme by including only geographically clustered groups into the analysis. Our results argue for a shared evolutionary history of central and eastern chimpanzees, justifying consideration of a combined taxon of equatorial chimpanzees. In a broader context our study underlines that the definition of subspecies is a problematic task and that inferences about the genetic structure of populations are strongly contingent on the distribution of the sampled individuals.