



FIGURE 16.16. Patterns of recolonization of Europe after the most recent glaciation, reconstructed on the basis of DNA sequence variation. The grasshopper, *Chorthippus parallelus*, shows little variation across northern Europe, suggesting expansion primarily from a Balkan refuge. The hedgehog is classified into two species, *Erinaceus europeus* and *Erinaceus concolor*, with subdivisions within these. The genealogy suggests expansion from three main refuges—in Iberia, Italy, and Greece. The bear, *Ursus arctos*, is thought to have expanded from two main refuges, in Iberia and in the Caucasus/Carpathian area; distinct sequences characteristic of these two expansions abut in Sweden. These histories are based on single loci (a noncoding nuclear sequence for *Chorthippus* and mitochondrial DNA for the others). However, they are supported in *Chorthippus* by the existence of sharp **hybrid zones** in the Pyrenees and Alps and in the hedgehog by the division into two species.

16.16, redrawn from Hewitt G., *Nature* **405**: 907–913, © 2000 Macmillan, www.nature.com