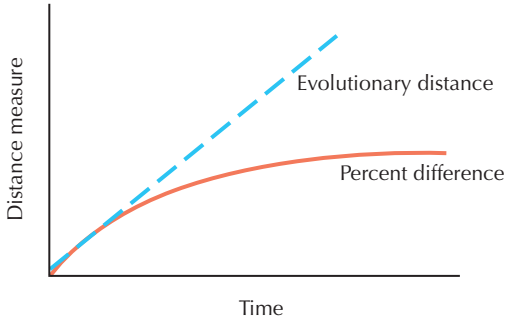

FIGURE 27.18. Distance corrections. If evolution occurs at a constant rate, then the percent difference between two OTUs should increase linearly with time (*blue dashed line*). However, this only applies if there are an infinite number of traits and states being compared. This does not occur with real data. For example, with DNA sequence data, there are only four possible states at any one character. This means that as two DNA sequences diverge, there is a limit to their maximum divergence. In addition, if multiple mutations occur at one site, the difference between the two DNA sequences will be less than the "evolutionary distance" between the organisms. The percent difference versus time will look something like the *red solid line* in this graph. For this reason, distance correction methods have been developed that allow the conversion of the *solid line* to the *dashed line* so that one can estimate the evolutionary distance from measures of percent difference.