

## PATTERNS OF EVOLUTION

- **Convergent Evolution** of several characteristics in unrelated species may occur if the two species have similar \_\_\_\_\_ and perform similar roles in the environment (e.g. the gliding action of the Australian sugar \_\_\_\_\_ and American flying squirrel).
- **Divergent Evolution** occurs when change from a common \_\_\_\_\_ increases as time passes (e.g. the variety of beaks in finches of the Galapagos Islands).
- **Biogeography** is the study of the distribution patterns of organisms. For example, studies of the distribution of organisms such as baobab trees in Western Australia and Africa suggest a \_\_\_\_\_ between the evolution of these trees.
- **Phylogeny** is the evolutionary history of an organism or a group of organisms.

## RATES OF EVOLUTION

- Evolution is assumed to be a very \_\_\_\_\_ process.
- **Gradualism or Uniformitarianism** - Fossil dating and the Theory of Continental Drift are based on the assumption that the \_\_\_\_\_ of change on the Earth (e.g. of erosion, sedimentation, volcanoes, earthquakes, climatic changes) has been much the \_\_\_\_\_ rate in the past as it is now. Also, it is assumed that mutations probably occurred at the same rate as they do today due to the sun's radiation. However, experiments causing mutations in irradiated fruit flies occur rarely. In larger animals with longer lifespans, the mutation rate would be so slow as to be nearly impossible for the evolution of these organisms to have taken place in the 4000 million years that many evolutionists say.
- **Punctuated Evolution** – However, contrary to the gradualist idea, the fossil record seems to indicate that the evolution of organisms is not gradual, but occurs at infrequent intervals. This could be explained by comparison with the effects of major climatic changes (e.g. \_\_\_\_\_ Ages, \_\_\_\_\_ eruptions), Earth's magnetic field changes, and cosmic catastrophes (e.g. impacts by meteorites, or near-misses by asteroids).