

PHYLOGENY

the evolutionary history of a species or groups of species

SYSTEMATICS

an approach to classifying organisms and determining their evolutionary relationships

ANALOGY

similarity due to convergent evolution rather than to a shared ancestry

EVALUATING MOLECULAR HOMOLOGIES

in this example 11 / 12 original bases have NOT changed since the species diverged

- 1.) homologous DNA sequences are identical between the 2 species
- 2.) deletion and insertion mutations shift and matching sequences
- 3.) those areas that are shaded in orange no longer match because of the mutations
- 4.) the matching regions are realigned using a computer program that puts gaps in sequence 1

TAXONOMY

- common names can be confusing
- scientific name= **binomial nomenclature**
 - * genus and species

HOMOLOGY

phenotypic and genetic similarities due to shared ancestry are called homologies

CLADISTICS

- cladistics uses common descent as the primary criteria to classify organisms
- due to descent with modification, organisms share some, but NOT ALL characteristics with their ancestors

PHYLOGENETIC TREE

- connect classification and phylogeny
- represents a hypothesis about evolutionary relationships

PHYLOGENIES

- phylogenies are inferred from both:
 - **molecular data** *gene sequences
 - *protein sequences
 - **morphological features** * presence or absence of fins
 - *number of legs
 - *structures of the organism

PARSIMONY

- **maximum parsimony**
- simplest explanation that is consistent with the facts

LIKELIHOOD

- **maximum likelihood**
- a tree can be found that most likely reflects the sequence of events



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