

Anna Graybeal: Phylog. Utility of genes 2/2/93  
& Mol. Syst. of Toads

Bufoadidae: True Toads

~357 species, 256 in Genus Bufo

Non-molecular syst.

- ① morphology not v. variable
- ② fossils - most are too recent
- ③ Karyotype all  $2N=22$  except one grp  $2N=20$
- ④ immunological work - some

Why need phylogeny

- ① biogeograph
- ② evolution of ~~XXXX~~ characters
- ③ speciation

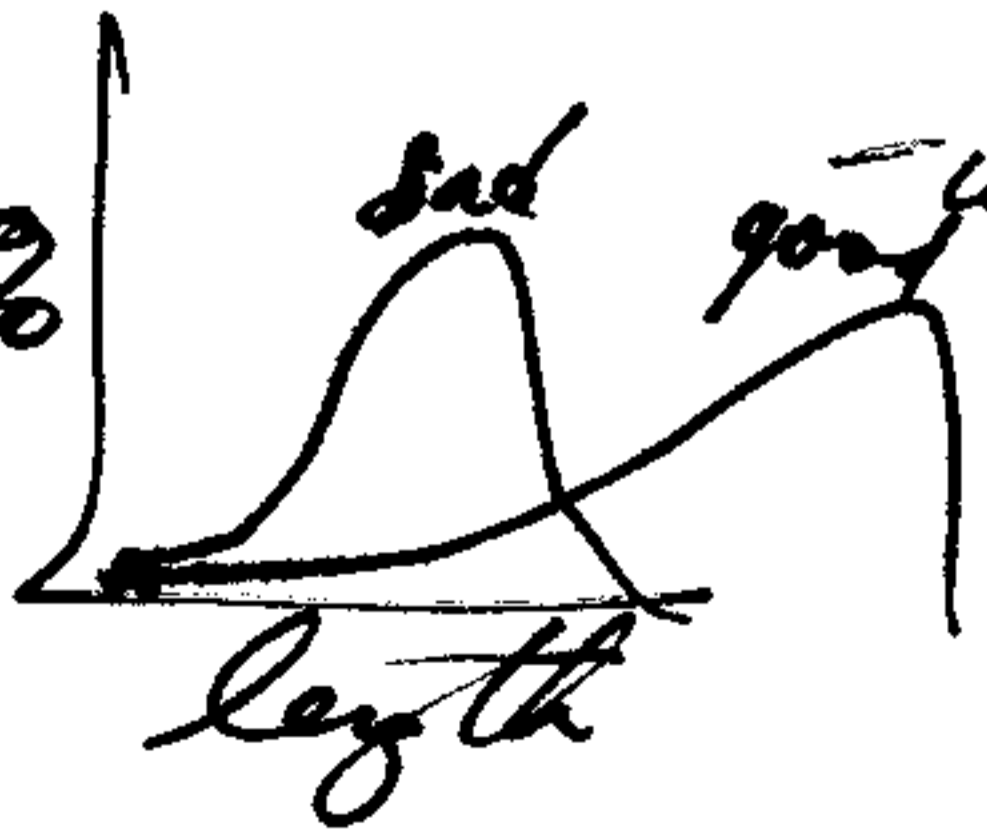
Molecular

① Cyt B.

-390 bp from many groups

-v. little aa. change w/in toads

-but aa changes don't match expected when compared to other vertebrates



uses this plot of tree length vs. frequency to get an idea of how separated parsimonious tree(s) is/are from other trees

## Next Gene

① Database search call amphib genes

② Eliminate problem ones

③ Analyze others

eg. ④ Calmodulin 1aa diff betw. eels & (vertebrates)

⑤ Mt proteins

cyt b

COX II

ND II

⑥ c-myc

⑦ c-mos

} lower rates of silent divergence

## Conclusion

- mt prot. bad 750-100 my

- mt rDNA OK to 100 my

- nucl. prot. ... lots

