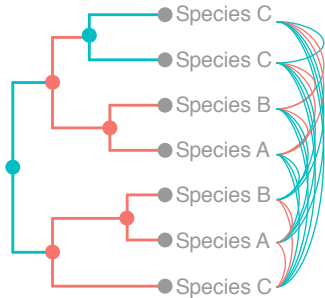A Pairwise comparisons
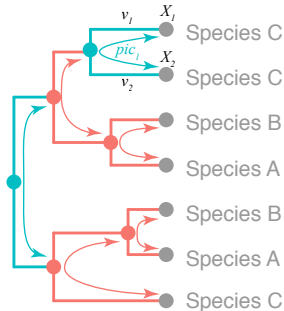
This example tree has 21 nonindependent pairwise comparisons:

8 pairwise comparisons between orthologs

13 pairwise comparisons between paralogs

● Speciation event
● Duplication event

B Phylogenetic independent contrasts

The same example tree has 6 independent contrasts:

→ 4 contrasts arising from speciation nodes

→ 2 contrasts arising from duplication nodes

The value of the top contrast is:

$$pic_1 = \frac{X_1 - X_2}{v_1 + v_2}$$

Observed trait change (difference between descendant values)

Expected variance (total branch length)