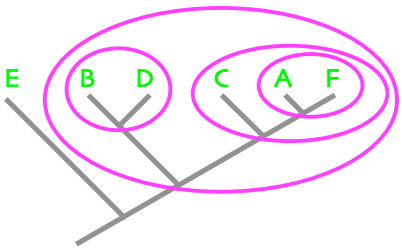
11.11.

1. mono-, para-, & polyphyly
2. form & representation of trees
3. consensus & compromise
4. summary

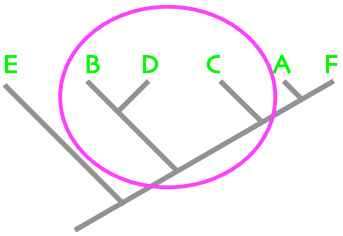
MONOPHYLY, paraphyly, polyphyly

1. Monophyletic group includes all the descendants of a common ancestor, i.e. all its members share a common ancestor
2. Paraphyletic group is formed when one or more descendants of a common ancestor are excluded from a group
3. Polyphyletic group is formed when a common ancestor is not included in a group

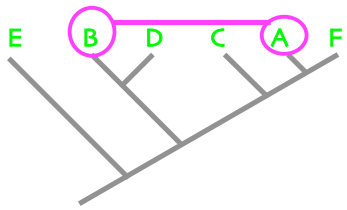
MONOPHYLY, paraphyly, polyphyly



MONOPHYLY, paraphyly, polyphyly



MONOPHYLY, paraphyly, polyphyly



MONOPHYLY, paraphyly, polyphyly

1. Monophyletic group is characterized by **SYNAPOMORPHY**

2. Paraphyletic group by plesiomorphy

and

3. Polyphyletic group by homoplasy

MONOPHYLY, paraphyly, polyphyly

1. Monophyletic groups give accurate information about evolutionary history

2. Paraphyletic groups inaccurate

and

3. Polyphyletic groups misleading information

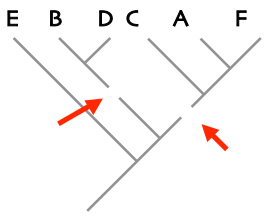
MONOPHYLY, paraphyly, polyphyly

1. Monophyletic group can be detached from a tree with a **single** cut

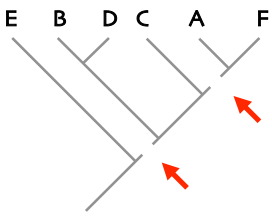
2. Paraphyletic group with 2

3. and polyphyletic group with ≥ 2

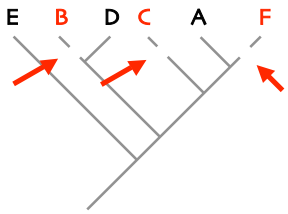
MONOPHYLY, paraphyly, polyphyly



MONOPHYLY, paraphyly, polyphyly



MONOPHYLY, paraphyly, polyphyly



MONOPHYLY, paraphyly, polyphyly

paraphyletic groups groups give too complicated explanation for evolutionary history of characters

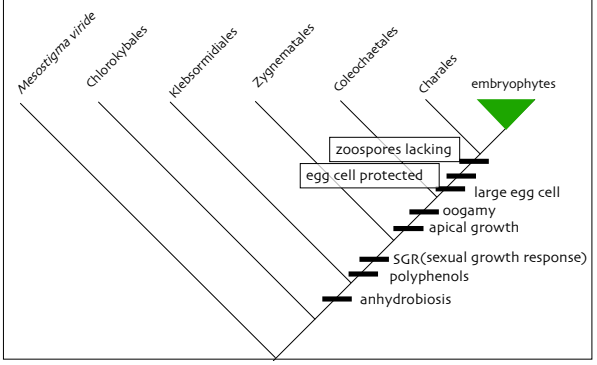
and

polyphyletic groups too simple e.g. Homeothermia

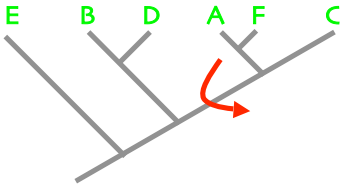
using these in classifications is misleading at best

MIXED USE IS DANGEROUS!!!

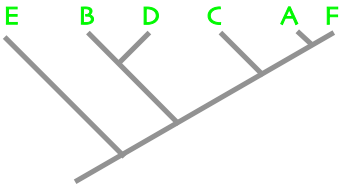
Embryophytes



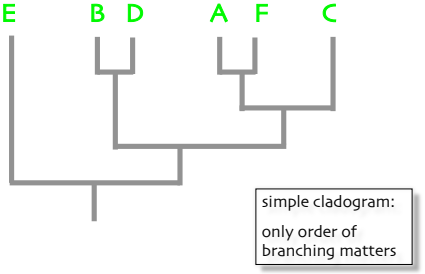
Form & representation of trees

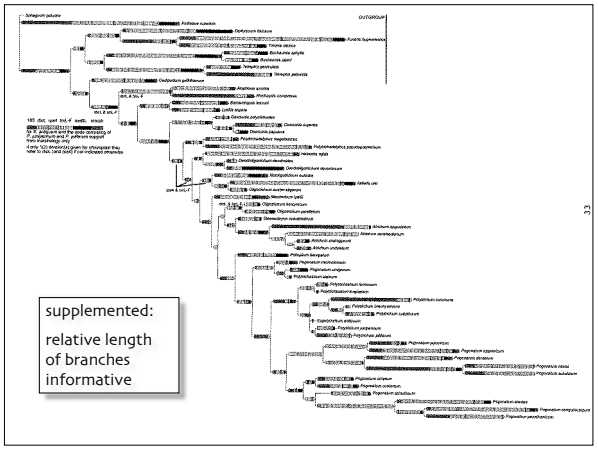


Form & representation of trees

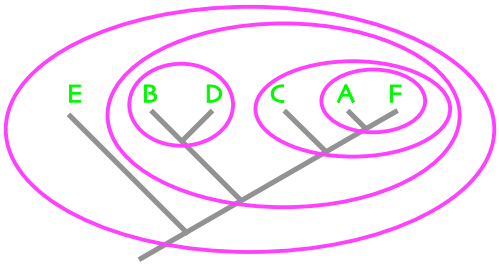


Form & representation of trees

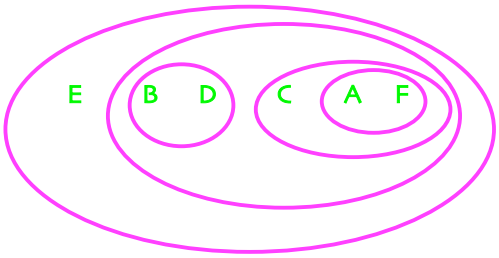




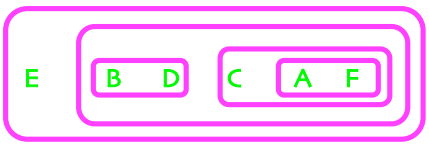
Form & representation of trees



Form & representation of trees



Form & representation of trees



Venn diagram

Form & representation of trees

from a Venn diagram ---->

Form & representation of trees

(E ((B D) (C (A F))))

a tree represented by a **parenthetical notation**

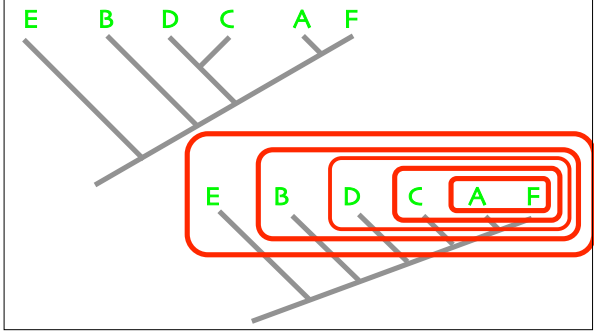
Form & representation of trees

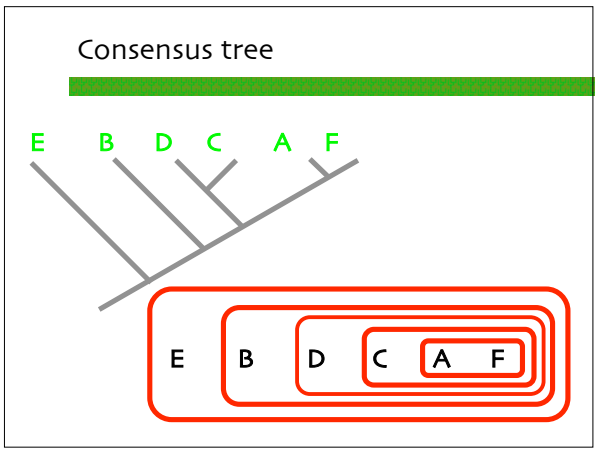
enables presentation of the results of cladistic analyses within normal text, e.g. abstracts of publications

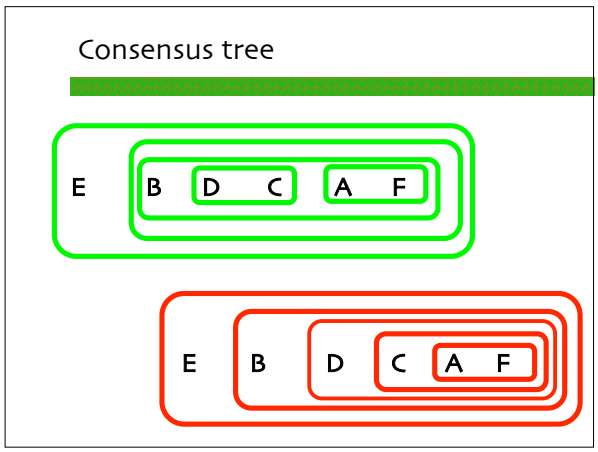
(E ((B D) (C (A F))))

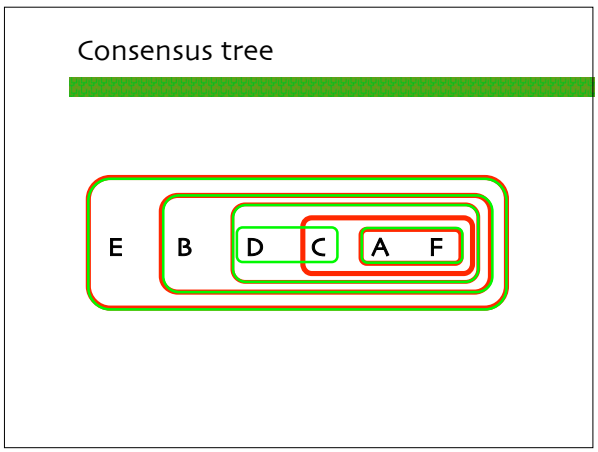
used also in cladistic programs

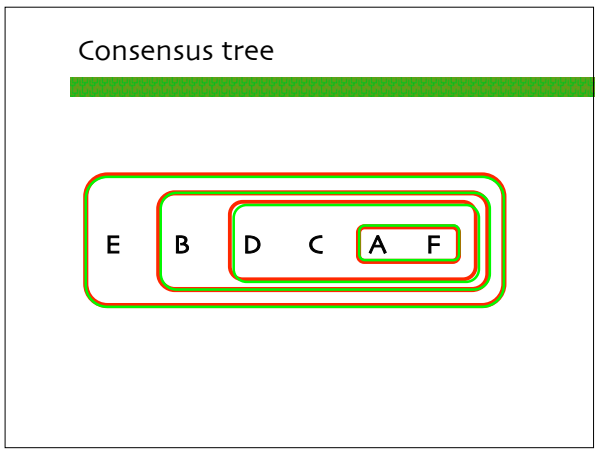
Consensus tree




Consensus tree
E B D C A F
E B D C A F

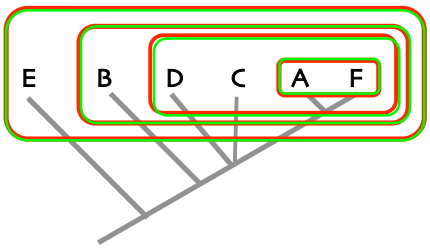

Consensus tree
E B D C A F
E B D C A F


Consensus tree
E B D C A F

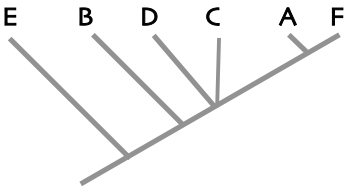

Consensus tree
E B D C A F

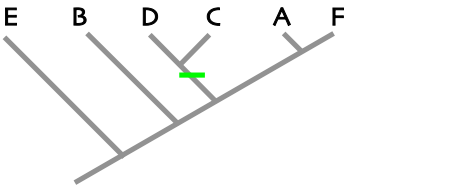
Consensus tree

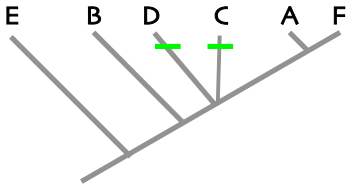
PLEASE NOTE! only groups that are present on BOTH of the original trees are presented and included in consensus. When making consensus remove the overlap PLUS retain only those present on both!

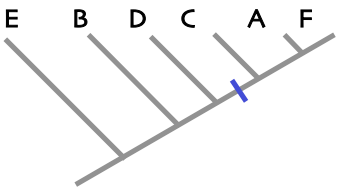


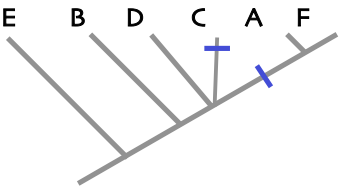
Consensus tree











Consensus tree

consensus tree is ALWAYS ONLY a SUMMARY

it is always MORE COMPLICATED explanation of evolutionary history of characters than any of the original trees

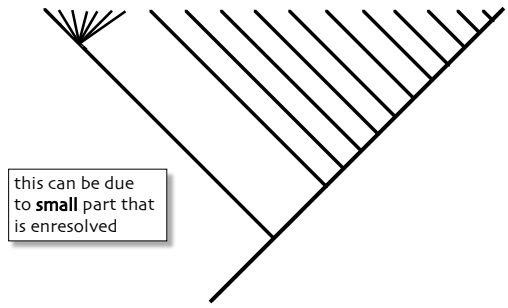
groups shared by ALL trees presented in one tree

large number of EPT´s a serious problem?

NOT necessarily, because...

n	B(n)
3	3
4	15
5	105
6	945
7	10 395
8	135 135
9	2 027 025
10	34 459 425
15	213 458 046 676 875
20	8 200 794 532 637 891 559 375

even if you have > 10 000 EPT´s



this can be due to **small** part that is enresolved

n	B(n)
3	3
4	15
5	105
6	945
7	10 395
8	135 135
9	2 027 025
10	34 459 425
15	213 458 046 676 875
20	8 200 794 532 637 891 559 375

Compromise trees

mostly mistakenly labelled as consensus trees

majority rule

Adams

combinable component (semistrict)

Compromise trees

Majority rule compromise

commonly used when values of different "support" indeces are given

groups that are presented by a majority rule compromise tree are normally those that are present on ≥ 50% of original trees

each group marked with a value that gives its percentage (50-100)

Compromise trees

Majority rule compromise

when used as a summary of parsimonious trees it should be noticed that part of the original equally parsimonious trees is in CONFLICT with the presented tree!

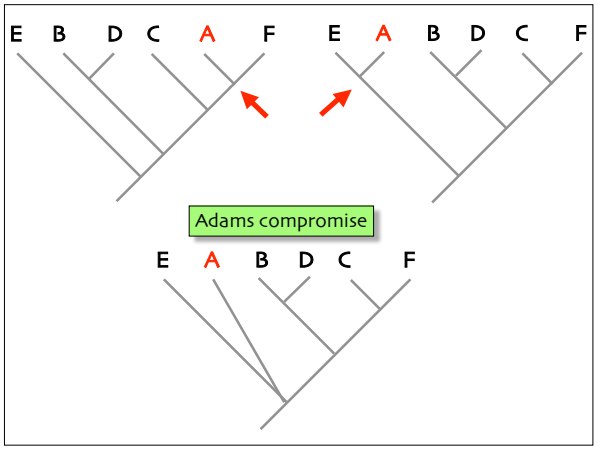
this kind of use NOT RECOMMENDED

Compromise trees

Adams compromise

terminals causing conflict are put in such a position on a compromise tree that is shared by all original trees

highlights problematic terminals

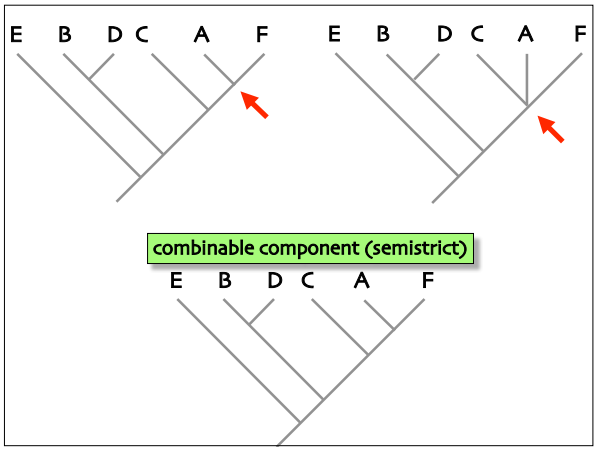


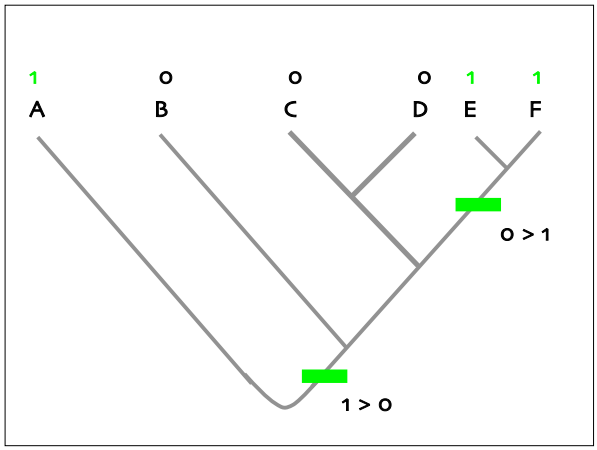
Compromise trees

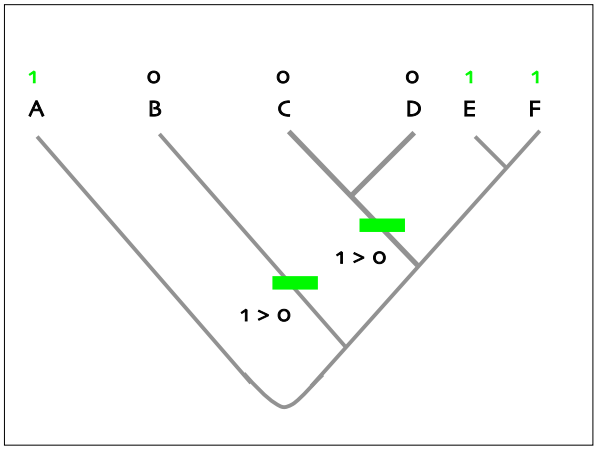
combinable component (semistrict)

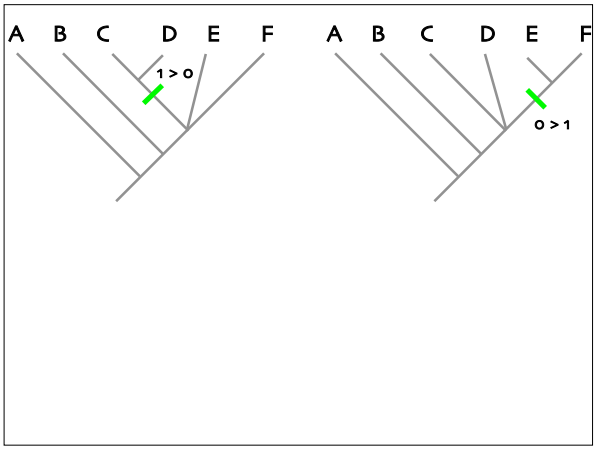
all groups presented that are NOT in conflict with any of the equally parsimonious trees

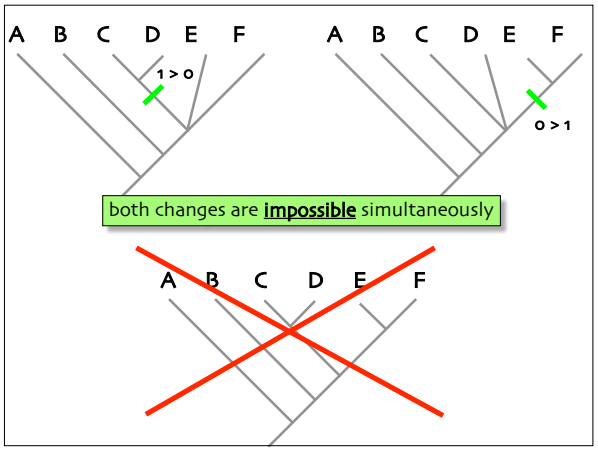
compromise tree might include groups that are not supported by the data SIMULTANEOUSLY











SUMMARY

monophyly is the VERY BASIC concept of cladistics

same information can be graphically presented in many ways

trees can be condensed into parenthetical notations

consensus is ONLY summary of numerous trees

both consensus & compromise trees can be useful tools
but only if used properly

all trees are NOT equal