```
#NEXUS

[Characters and character states scored by Nathan A Jud, constraint tree topology
from APwebsite, 2014]


begin taxa;
        dimensions ntax=58;
        taxlabels
Osmun
Gnetu     Ambor     Trime     Cabom     Nupha     Austr
Schiz     Illic     Chlor     Myris     Illig     Drimy
Piper     Peper     Asaru     Acoru     Arisa     Lasia
Cerat     Eupte     Pteri     Hypec     Coryd     Fumar
Stylm     Macle     Sangu     Glauc     Styln
Hunne     Lardi     Circa     Menis     Berbe     Ranun
Exnel     Nelum     Sapin     Plata     Belle     Placo
Symph     Isopo     Petro     Synap     Knigh     Sphal
Musgr     Ausmu     Hakea     Steno     Carna     Sabia
Troch     Tetra     Fairl     Selag
        ;

end;

[
Characters
1  habit (0) herbaceous (1) woody
2  branching (0) dichotomous (1) branches subtend leaves (2) leaves subtend
branches
3  megaphylls (sp) (0) absent (1) present
4  leaves (0) sessile (1) petiolate
5  petiole attachment: (0) marginal (1) peltate
6  leaves (0) simple (1) compound
7  primary vein framework (0) pinnate (1) actinodromous (2) palinactinodromous (3)
reticulodromous (4) campylodomous (5) open (6) parallel
8  mode of leaf dissection (0) undissected (1) basipetal (2) acropetal (3)
Polyternate (4) basipetal pedate (5) acropetal anadromous (6) other
9  apical fusion of primary/secondary veins (0) absent (1) present
10 intramarginal vein (0) absent (1) present
11 minor tertiary veins (0) absent (1) reticulate (2) percurrent
12 freely ending veinlets (0) absent (1) present
13 leaf margin (0) smooth (1) teeth at major veins (2) serrate
14 glandular/hydathodal teeth (0) absent (1) present
15 stipules (0) absent (1) present (2)interpetiolar
]

begin characters;
        dimensions nchar=15;
```

```
        format symbols = "01234567";
        matrix

Osmun   000777777777777
Gnetu   121100000011000
Ambor   121100000011210
Trime   0210?0000000000
Cabom   0211(0 1)(0 1)1?0010000
Nupha   02111000001000(0 1)
Austr   121100000021002
Schiz   121100000021210
Illic   1211000000(1 2)1000
Chlor   (0 1)21100000021212
Myris   121100000021000
Illig   1211010?0021000
Drimy   121100000011000
Piper   021100(0 4)00021002
Peper   021110400021002
Asaru   021110200010000
Acoru   0210?0601010000
Arisa   021111061110000
Lasia   021110061010100
Cerat   0210?0561000000
Eupte   121100000021200
Pteri   021101011000110
Hypec   0211010(1 2)1110110
Coryd   0211013(2 3 4)1110110
Fumar   0211013(2 3 4)1110110
Stylm   021101010111010
Macle   021101040021210
Sangu   021100240011100
Glauc   02110011001(0 1)210
Styln   021101021110110
Hunne   021101041110110
Lardi   12110104000(1 2)(0 1)00
Circa   0210?0500000100
Menis   0211(0 1)01(0 4)0011(0 1)(0 1)0
Berbe   1211000(0 1)0(0 1)1(0 1)(0 2)0(0 1)
Ranun   0211(0 1)(0 1)2(0 4)0(0 1)10(1 2)(0 1)0
Exnel   0?11101001(1 2)131?
Nelum   021110100020002
Sapin   121101020(0 1)1?(0 2)0?
Plata   1211(0 1)1240021201
Belle   (0 1)21100040111110
Placo   121100020021000
Symph   (0 1)21100240???1?0
Isopo   (0 1)2110(0 1)0(0 5)?110110
Petro   121100050110100
```

```
Synap   (0 1)211000(4 5)0110110
Knigh   121100000021210
Sphal   12110(0 1)000021200
Musgr   121100020021000
Ausmu   12110(0 1)(0 4)20021000
Hakea   121100(0 2 4)(0 4)(0 1)110(0 1 2)00
Steno   121100120021000
Carna   121101060011200
Sabia   121100000021000
Troch   121100000021210
Tetra   121100100021210
Fairl   021100051110110
Selag   000777777777777
        ;
end;

begin assumptions;
        options deftype = ord;
end;

begin trees;
        Title Tracheophytes;
        LINK Taxa = Taxa;
        TRANSLATE
[0]             1 Osmun,
[1]             2 Gnetu,
[7]             3 Ambor,
[8]             4 Trime,
[9]             5 Cabom,
[10]            6 Nupha,
[11]            7 Austr,
[12]            8 Schiz,
[13]            9 Illic,
[14]            10 Chlor,
[15]            11 Myris,
[16]            12 Illig,
[17]            13 Drimy,
[18]            14 Piper,
[19]            15 Peper,
[20]            16 Asaru,
[21]            17 Acoru,
[22]            18 Arisa,
[23]            19 Lasia,
[24]            20 Cerat,
[25]            21 Eupte,
[26]            22 Pteri,
[27]            23 Hypec,
[28]            24 Coryd,
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[29]            25 Fumar,
[30]            26 Stylm,
[31]            27 Macle,
[32]            28 Sangu,
[33]            29 Glauc,
[34]            30 Styln,
[35]            31 Hunne,
[36]            32 Lardi,
[37]            33 Circa,
[38]            34 Menis,
[39]            35 Berbe,
[40]            36 Ranun,
[41]            37 Exnel,
[42]            38 Nelum,
[43]            39 Sapin,
[44]            40 Plata,
[45]            41 Belle,
[46]            42 Placo,
[47]            43 Symph,
[48]            44 Isopo,
[49]            45 Petro,
[50]            46 Synap,
[51]            47 Knigh,
[52]            48 Sphal,
[53]            49 Musgr,
[54]            50 Ausmu,
[55]            51 Hakea,
[56]            52 Steno,
[57]            53 Carna,
[58]            54 Sabia,
[59]            55 Troch,
[60]            56 Tetra,
[61]            57 Fairl,
[62]        58 Selag;
        TREE *Euphylls =
(58,(1,(2,(3,((4,(6,5)),((9,(8,7)),((10,((11,12),(13,(16,(14,15))))),((17,(18,19)),
(20,(((55,56),(54,((37,38),((39,40),((41,42),((51,52),(43,((46,(44,45)),(53,(47,(48
,(49,50))))))))))),(21,(((33,32),(34,(36,35))),(22,((31,(30,(28,(27,(29,26))))),(2
3,(24,25))))))))))))));
END;

Begin PAUP;
PSet MSTaxa = Polymorph;
Outgroup Selag [/Only];
hsearch swap= TBR hold= 9 constraints= Euphylls enforce=yes;
savetrees;
contree all/strict=yes treefile=FairCon6.tre;
contree all/strict=no adams=yes treefile=FairAdams.tre;
```

```
END;
```