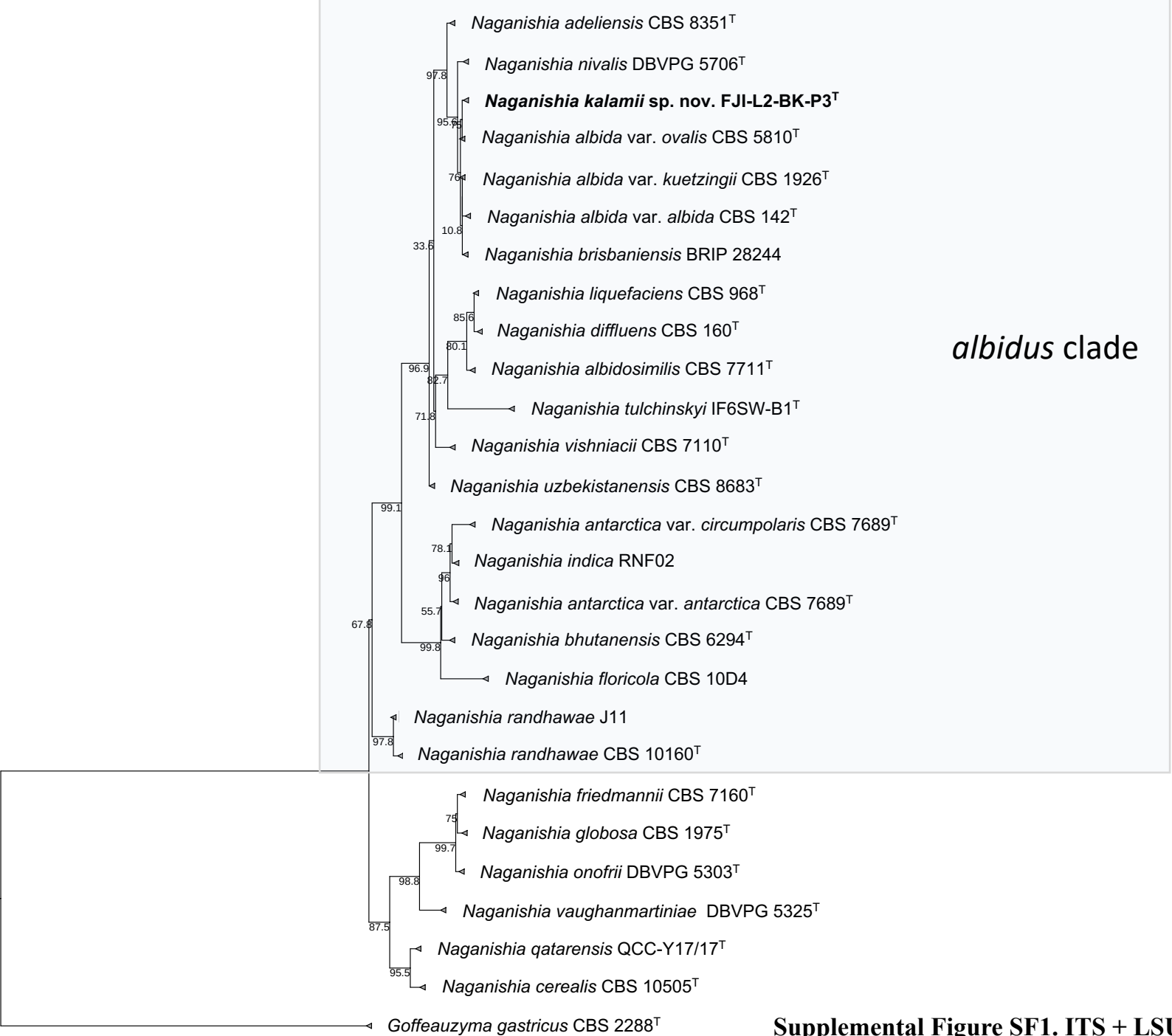


Supplementary figures

Tree scale: 0.1

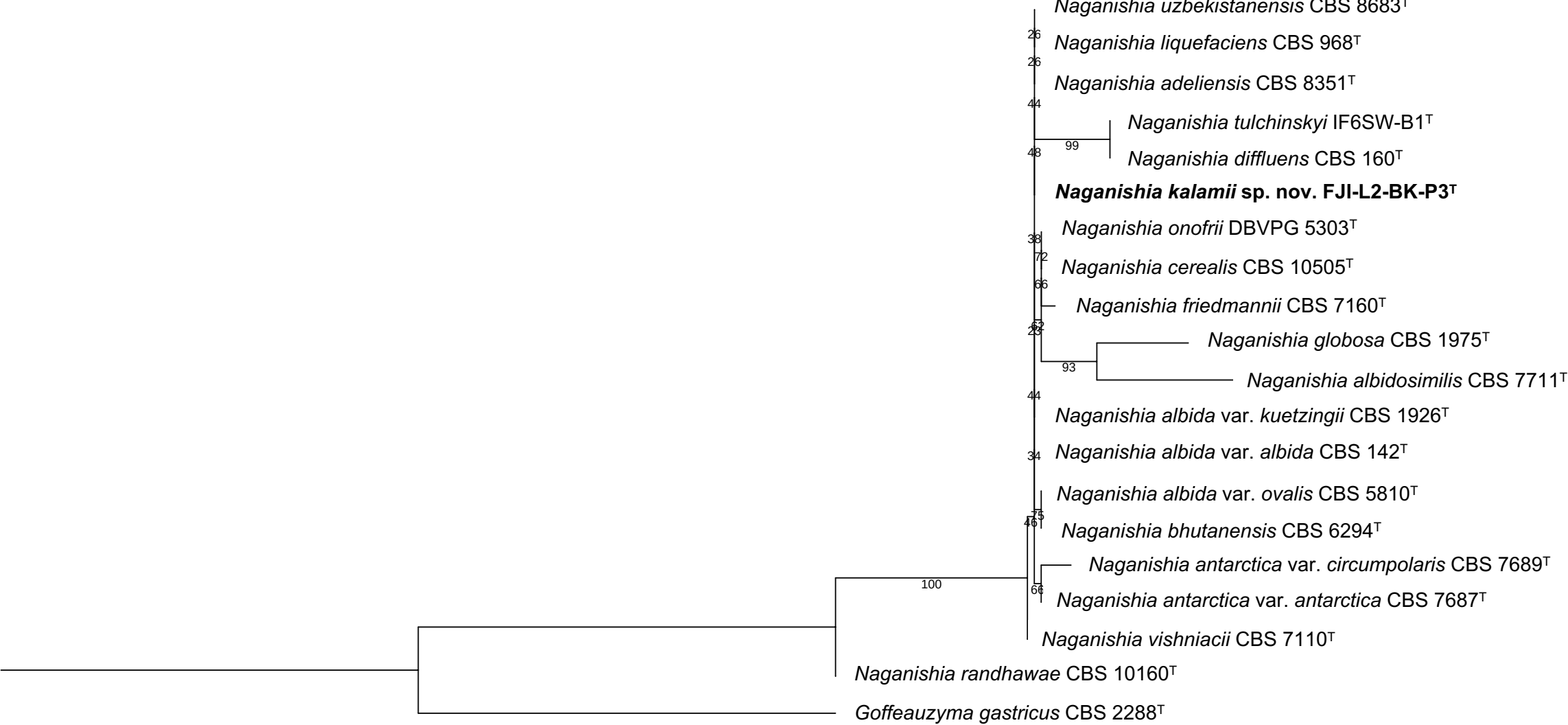


Supplemental Figure SF1. ITS + LSU.

Supplemental
Figure SF2

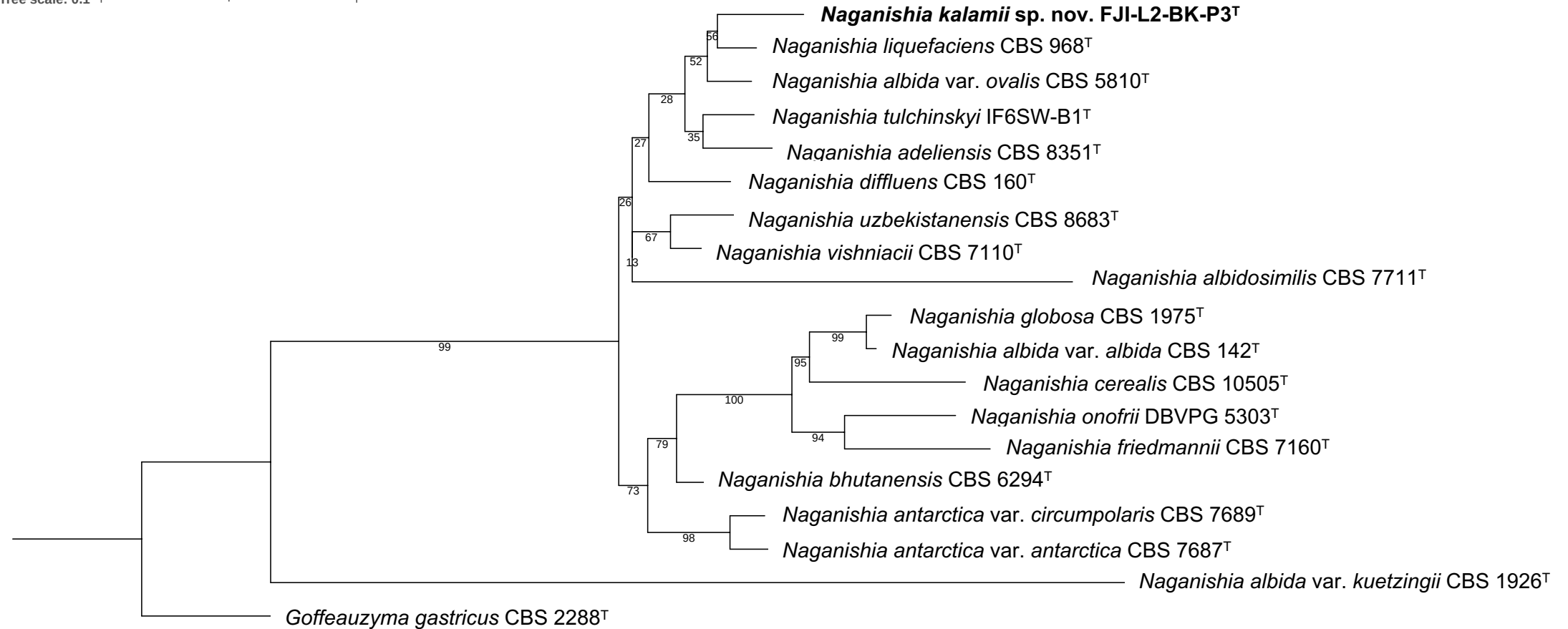
| ITS | <i>Naganishia_kalamii</i> _FJI-L2-BK-P3 | | 0.000 | 0.002 | 0.005 | 0.008 | 0.002 | 0.003 | 0.025 | 0.025 | 0.023 | 0.104 | 0.104 | 0.121 | 0.054 | 0.000 | 0.102 | 0.015 | 0.091 | 0.062 | 0.103 | 0.084 | 0.035 | 0.028 | 0.032 | 0.038 | 0.350 |
|-----|---|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| | <i>Naganishia_albida_var_ovalis</i> _CBS5810 | 0.044 | | 0.002 | 0.005 | 0.008 | 0.002 | 0.003 | 0.025 | 0.025 | 0.023 | 0.104 | 0.104 | 0.121 | 0.054 | 0.000 | 0.102 | 0.015 | 0.091 | 0.062 | 0.103 | 0.084 | 0.035 | 0.028 | 0.032 | 0.038 | 0.350 |
| | <i>Naganishia_albida_var_kuetzingii</i> _CBS1926 | 0.045 | 0.042 | | 0.003 | 0.006 | 0.004 | 0.002 | 0.025 | 0.025 | 0.023 | 0.106 | 0.106 | 0.121 | 0.056 | 0.000 | 0.104 | 0.015 | 0.093 | 0.064 | 0.105 | 0.086 | 0.037 | 0.029 | 0.034 | 0.040 | 0.352 |
| | <i>Naganishia_albida_var_albida</i> _CBS142 | 0.047 | 0.044 | 0.042 | | 0.010 | 0.007 | 0.005 | 0.028 | 0.028 | 0.026 | 0.108 | 0.108 | 0.125 | 0.059 | 0.000 | 0.106 | 0.015 | 0.093 | 0.067 | 0.107 | 0.086 | 0.040 | 0.033 | 0.037 | 0.044 | 0.352 |
| | <i>Naganishia_adeliensis</i> _CBS8351 | 0.055 | 0.052 | 0.054 | 0.055 | | 0.009 | 0.008 | 0.028 | 0.028 | 0.026 | 0.106 | 0.106 | 0.123 | 0.056 | 0.000 | 0.106 | 0.018 | 0.093 | 0.064 | 0.105 | 0.086 | 0.037 | 0.031 | 0.037 | 0.040 | 0.350 |
| | <i>Naganishia_nivalis</i> _DBVPG5706 | 0.055 | 0.051 | 0.053 | 0.055 | 0.059 | | 0.006 | 0.021 | 0.021 | 0.019 | 0.092 | 0.089 | 0.057 | 0.035 | 0.003 | 0.095 | 0.013 | 0.075 | 0.042 | 0.090 | 0.073 | 0.033 | 0.013 | 0.018 | 0.023 | 0.348 |
| | <i>Naganishia_brisbanensis</i> _BRIP_28244 | NA | NA | NA | NA | NA | NA | | 0.027 | 0.027 | 0.026 | 0.111 | 0.113 | 0.126 | 0.060 | NA | 0.108 | 0.017 | 0.095 | 0.068 | 0.110 | 0.089 | 0.038 | 0.032 | 0.037 | 0.043 | 0.372 |
| | <i>Naganishia_albidosimilis</i> _CBS7711 | 0.060 | 0.064 | 0.066 | 0.067 | 0.064 | 0.064 | NA | | 0.000 | 0.002 | 0.101 | 0.100 | 0.109 | 0.059 | 0.000 | 0.102 | 0.023 | 0.089 | 0.067 | 0.101 | 0.089 | 0.037 | 0.039 | 0.037 | 0.040 | 0.357 |
| | <i>Naganishia_liquefaciens</i> _CBS968 | 0.064 | 0.066 | 0.067 | 0.069 | 0.066 | 0.066 | NA | 0.052 | | 0.002 | 0.101 | 0.100 | 0.109 | 0.059 | 0.000 | 0.102 | 0.023 | 0.089 | 0.067 | 0.101 | 0.089 | 0.037 | 0.039 | 0.037 | 0.040 | 0.357 |
| | <i>Naganishia_diffluens</i> _CBS160 | 0.066 | 0.069 | 0.071 | 0.072 | 0.069 | 0.070 | NA | 0.054 | 0.044 | | 0.102 | 0.102 | 0.109 | 0.058 | 0.000 | 0.104 | 0.021 | 0.089 | 0.066 | 0.101 | 0.089 | 0.038 | 0.041 | 0.039 | 0.042 | 0.354 |
| | <i>Naganishia_friedmannii</i> _CBS7160 | 0.081 | 0.078 | 0.079 | 0.081 | 0.045 | 0.085 | NA | 0.088 | 0.090 | 0.093 | | 0.011 | 0.182 | 0.071 | 0.088 | 0.011 | 0.101 | 0.079 | 0.077 | 0.077 | 0.083 | 0.090 | 0.092 | 0.086 | 0.085 | 0.363 |
| | <i>Naganishia_globosa</i> _CBS1975 | 0.079 | 0.076 | 0.078 | 0.079 | 0.044 | 0.085 | NA | 0.086 | 0.088 | 0.092 | 0.017 | | 0.180 | 0.071 | 0.000 | 0.014 | 0.100 | 0.077 | 0.079 | 0.083 | 0.079 | 0.088 | 0.090 | 0.086 | 0.085 | 0.364 |
| | <i>Naganishia_tulchinskii</i> _IF6SW-B1 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | | 0.135 | 0.047 | 0.181 | 0.119 | 0.172 | 0.146 | 0.200 | 0.186 | 0.101 | 0.119 | 0.124 | 0.136 | 0.459 |
| | <i>Naganishia_randhawae</i> _J11 | 0.088 | 0.084 | 0.086 | 0.084 | 0.047 | 0.095 | NA | 0.097 | 0.099 | 0.098 | 0.032 | 0.030 | NA | | 0.000 | 0.075 | 0.052 | 0.055 | 0.006 | 0.085 | 0.057 | 0.036 | 0.039 | 0.040 | 0.044 | 0.346 |
| | <i>Naganishia_uzbekistanensis</i> _CBS8683 | 0.057 | 0.060 | 0.062 | 0.064 | 0.024 | 0.068 | NA | 0.062 | 0.062 | 0.064 | 0.044 | 0.042 | NA | 0.049 | | 0.000 | 0.000 | NA | NA | NA | NA | 0.060 | 0.000 | NA | NA | 0.000 |
| | <i>Naganishia_onofrii</i> _DBVPG5303 | 0.080 | 0.077 | 0.078 | 0.080 | 0.043 | 0.085 | NA | 0.088 | 0.090 | 0.093 | 0.013 | 0.013 | NA | 0.029 | 0.041 | | 0.100 | 0.082 | 0.082 | 0.089 | 0.088 | 0.084 | 0.090 | 0.090 | 0.089 | 0.369 |
| | <i>Naganishia_vishniacii</i> _CBS7110 | 0.059 | 0.060 | 0.062 | 0.062 | 0.030 | 0.064 | NA | 0.062 | 0.062 | 0.067 | 0.050 | 0.049 | NA | 0.059 | 0.030 | 0.048 | | 0.089 | 0.060 | 0.099 | 0.080 | 0.033 | 0.033 | 0.027 | 0.033 | 0.350 |
| | <i>Naganishia_qatarensis</i> _QCC-Y17/17 | 0.081 | 0.078 | 0.077 | 0.081 | 0.047 | 0.083 | NA | 0.084 | 0.086 | 0.086 | 0.029 | 0.027 | NA | 0.032 | 0.045 | 0.025 | 0.045 | | 0.060 | 0.076 | 0.015 | 0.072 | 0.072 | 0.072 | 0.070 | 0.377 |
| | <i>Naganishia_randhawae</i> _CBS10160 | 0.088 | 0.084 | 0.086 | 0.084 | 0.047 | 0.095 | NA | 0.097 | 0.099 | 0.098 | 0.032 | 0.030 | NA | 0.014 | 0.049 | 0.029 | 0.059 | 0.031 | | 0.087 | 0.057 | 0.044 | 0.046 | 0.046 | 0.046 | 0.361 |
| | <i>Naganishia_vaughanmartinae</i> _DBVPG4736 | 0.076 | 0.073 | 0.076 | 0.076 | 0.030 | 0.083 | NA | 0.085 | 0.088 | 0.090 | 0.004 | 0.002 | NA | 0.013 | 0.028 | 0.002 | 0.030 | 0.011 | 0.013 | | 0.080 | 0.090 | 0.092 | 0.084 | 0.078 | 0.400 |
| | <i>Naganishia_cerealis</i> _CBS10505 | 0.087 | 0.083 | 0.085 | 0.087 | 0.051 | 0.084 | NA | 0.090 | 0.092 | 0.092 | 0.032 | 0.030 | NA | 0.035 | 0.049 | 0.030 | 0.049 | 0.022 | 0.035 | 0.017 | | 0.066 | 0.066 | 0.062 | 0.060 | 0.394 |
| | <i>Naganishia_floricola</i> _10D4 | 0.109 | 0.106 | 0.107 | 0.106 | 0.079 | 0.108 | NA | 0.115 | 0.117 | 0.116 | 0.078 | 0.076 | NA | 0.081 | 0.078 | 0.082 | 0.081 | 0.081 | 0.084 | 0.062 | 0.072 | | 0.013 | 0.010 | 0.011 | 0.356 |
| | <i>Naganishia_bhutanensis</i> _CBS6294 | 0.097 | 0.093 | 0.095 | 0.093 | 0.063 | 0.103 | NA | 0.102 | 0.102 | 0.102 | 0.068 | 0.067 | NA | 0.068 | 0.061 | 0.068 | 0.065 | 0.061 | 0.068 | 0.060 | 0.067 | 0.041 | | 0.012 | 0.014 | 0.345 |
| | <i>Naganishia_antarctica_var_circumpolaris</i> _CBS7689 | 0.127 | 0.123 | 0.125 | 0.123 | 0.094 | 0.124 | NA | 0.131 | 0.131 | 0.131 | 0.099 | 0.098 | NA | 0.099 | 0.092 | 0.092 | 0.096 | 0.092 | 0.099 | 0.064 | 0.096 | 0.062 | 0.047 | | 0.004 | 0.366 |
| | <i>Naganishia_antarctica_var_antarcticus</i> _CBS7687 | 0.095 | 0.092 | 0.093 | 0.092 | 0.066 | 0.101 | NA | 0.099 | 0.099 | 0.099 | 0.071 | 0.069 | NA | 0.071 | 0.064 | 0.069 | 0.067 | 0.064 | 0.071 | 0.062 | 0.069 | 0.047 | 0.026 | 0.044 | | 0.398 |
| | <i>Goffeauzyma_gastricus</i> _CBS2288 | 0.183 | 0.179 | 0.181 | 0.183 | 0.191 | 0.198 | NA | 0.191 | 0.185 | 0.187 | 0.191 | 0.189 | NA | 0.191 | 0.193 | 0.197 | 0.195 | 0.185 | 0.191 | 0.124 | 0.200 | 0.226 | 0.217 | 0.256 | 0.217 | |

Tree scale: 0.01



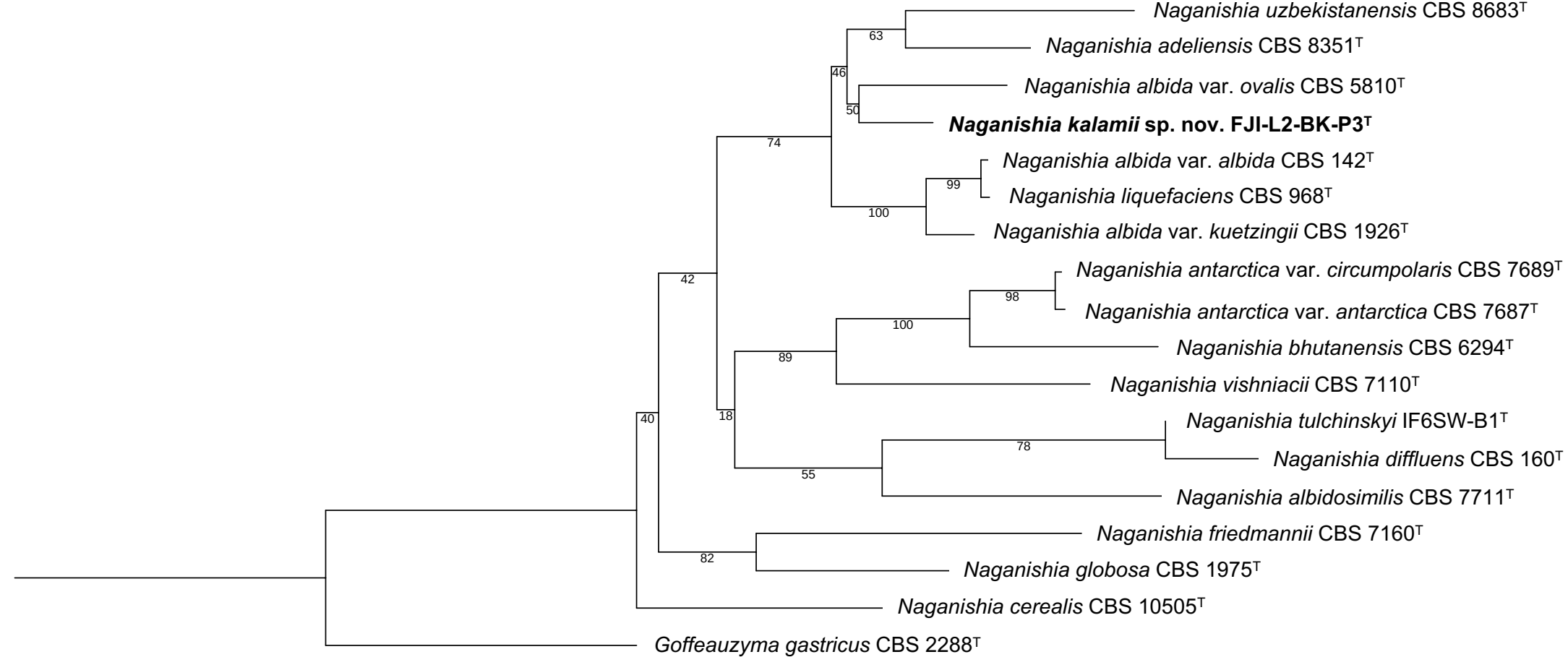
Supplemental Figure SF3. SSU

Tree scale: 0.1



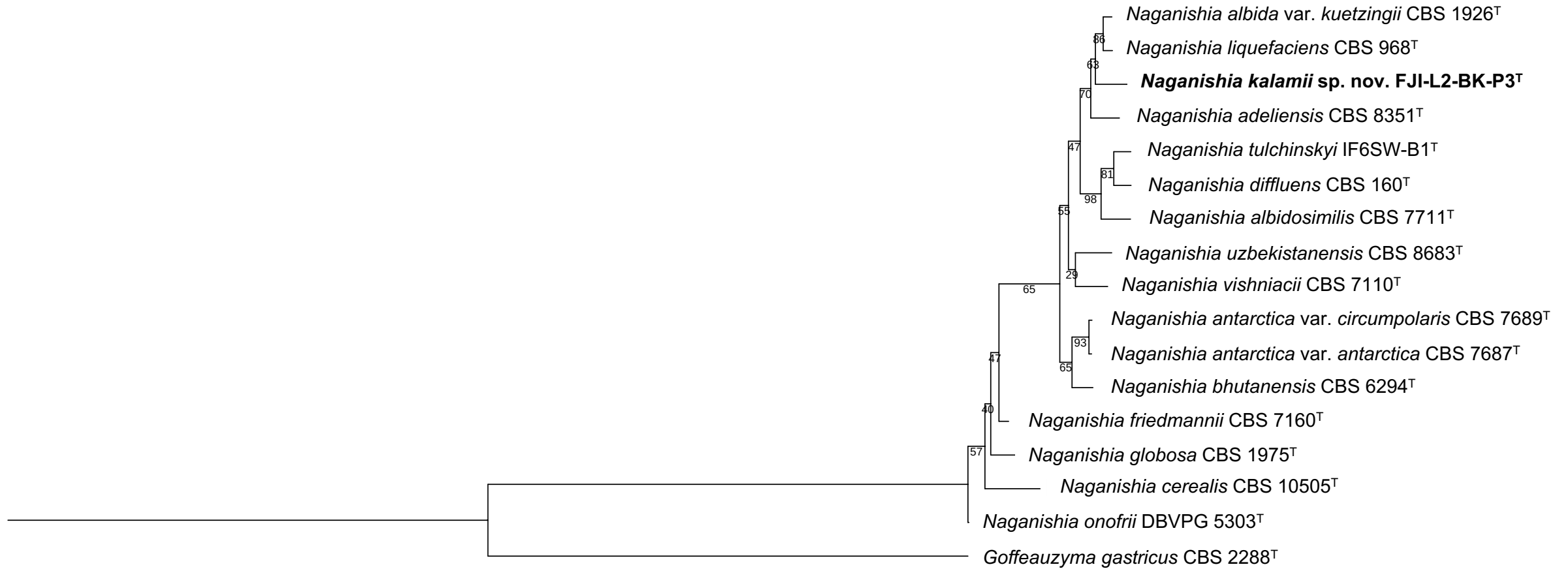
Supplemental Figure SF4. *CYT*B

Tree scale: 1



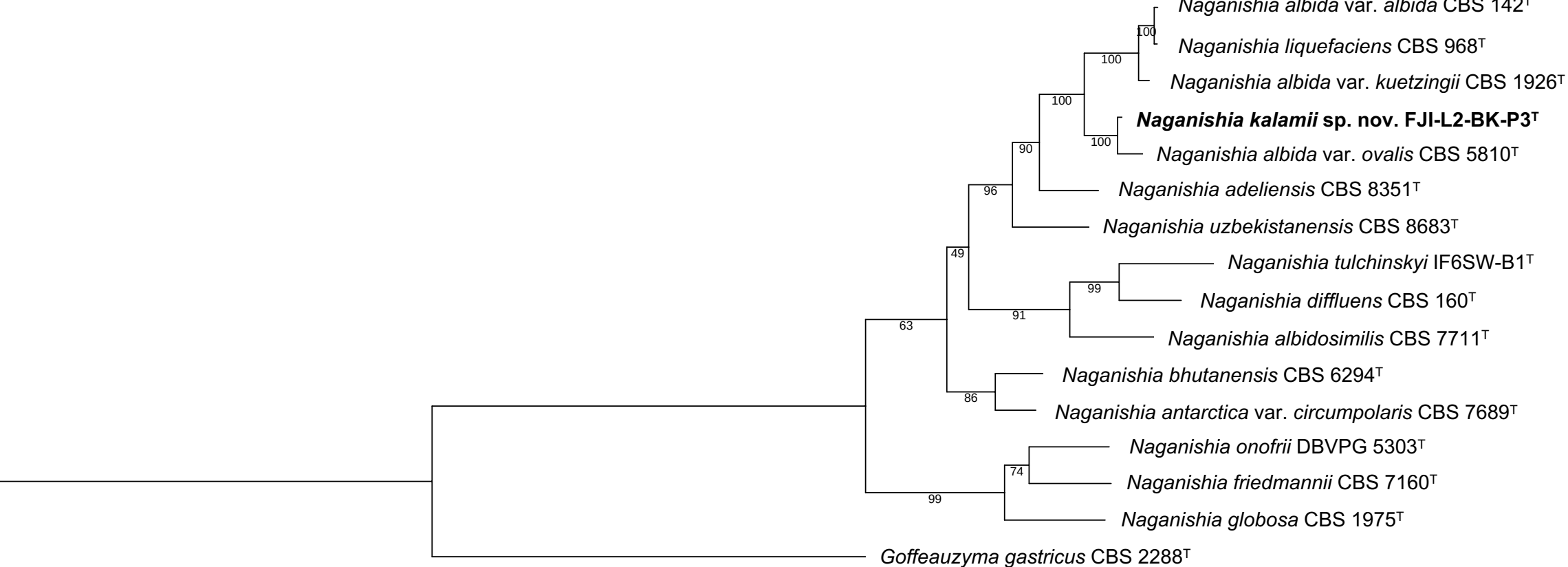
Supplemental Figure SF5. *TEF1*

Tree scale: 1

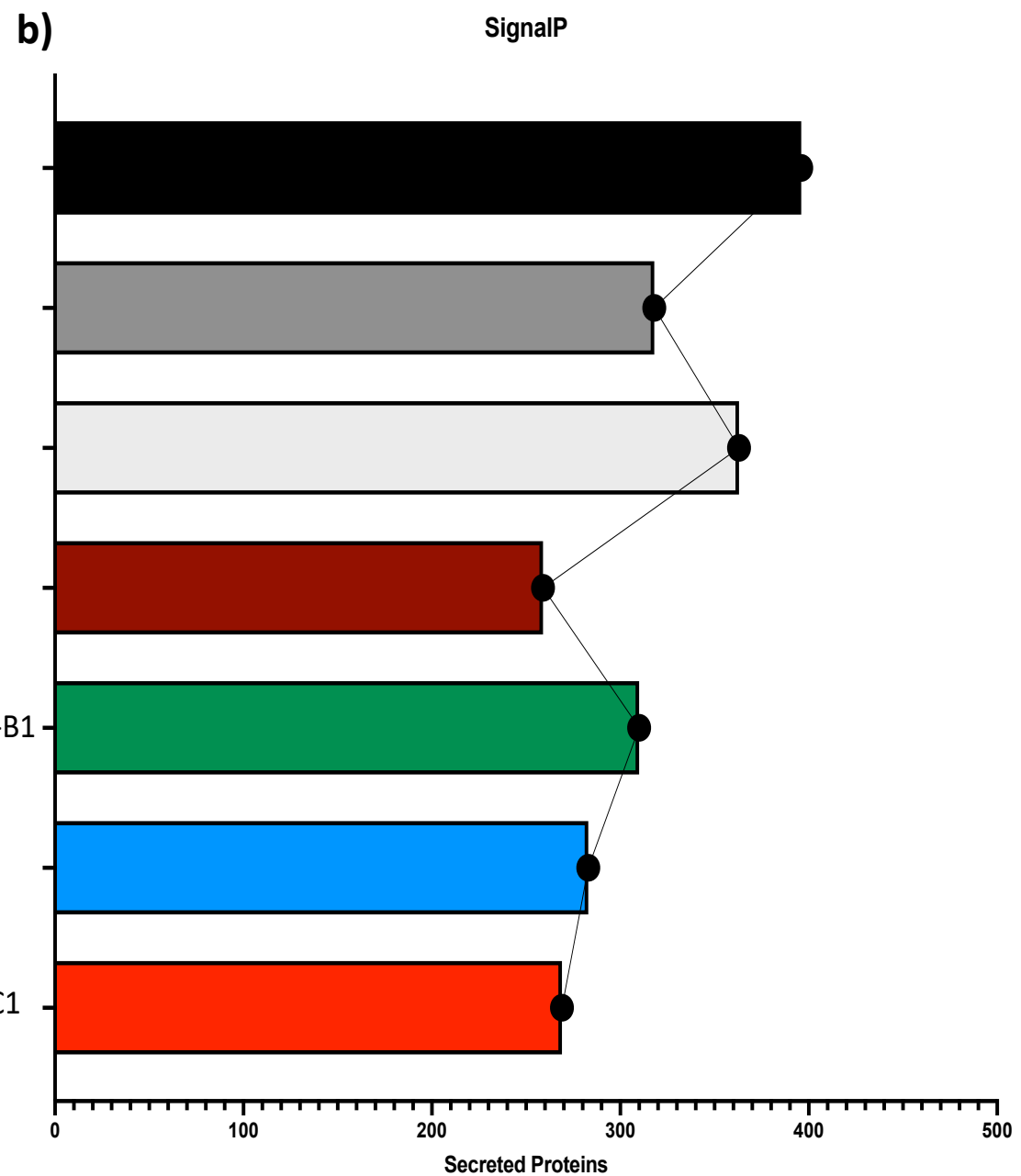
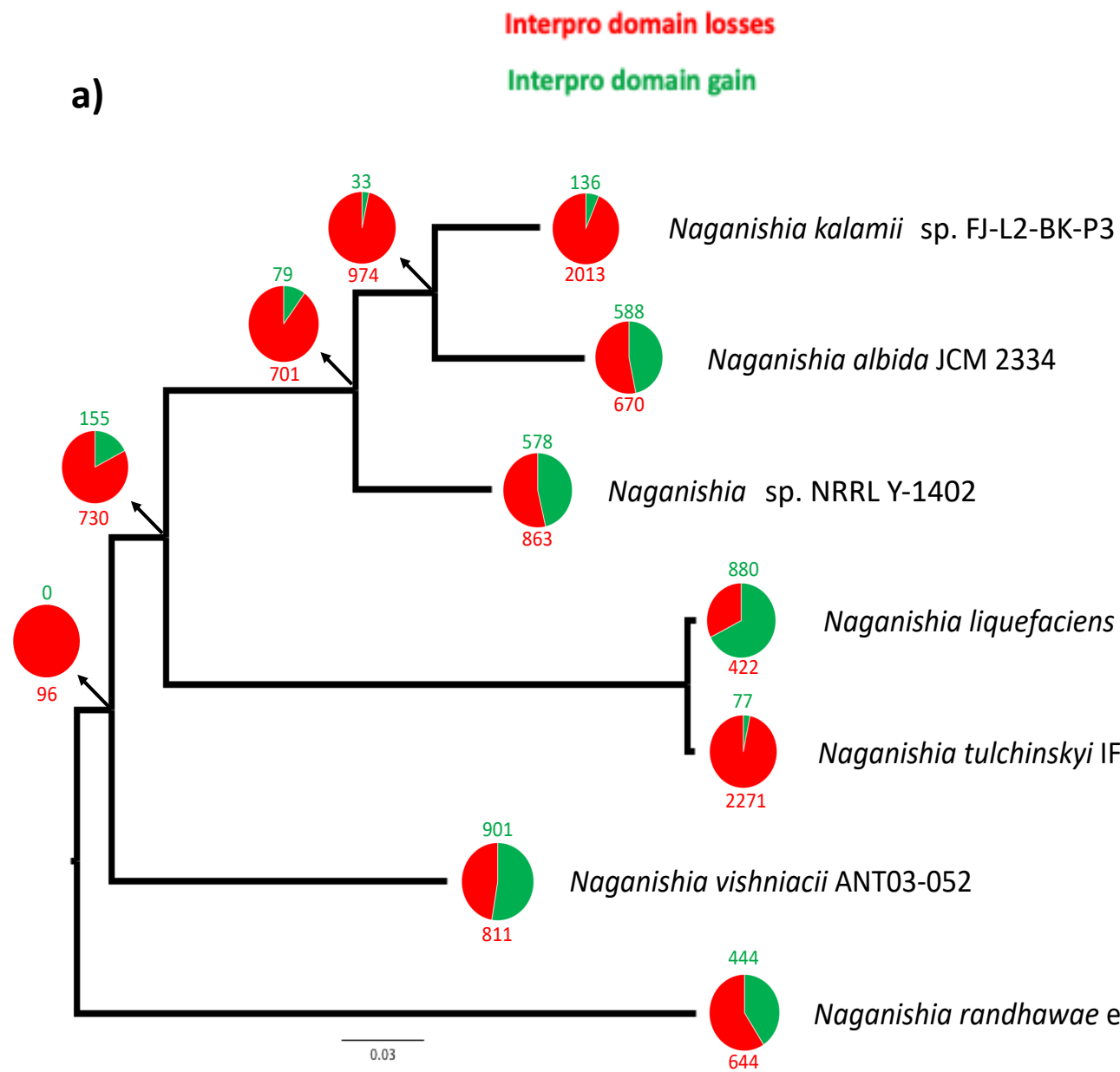


Supplemental Figure SF6. *RPB1*

Tree scale: 0.1

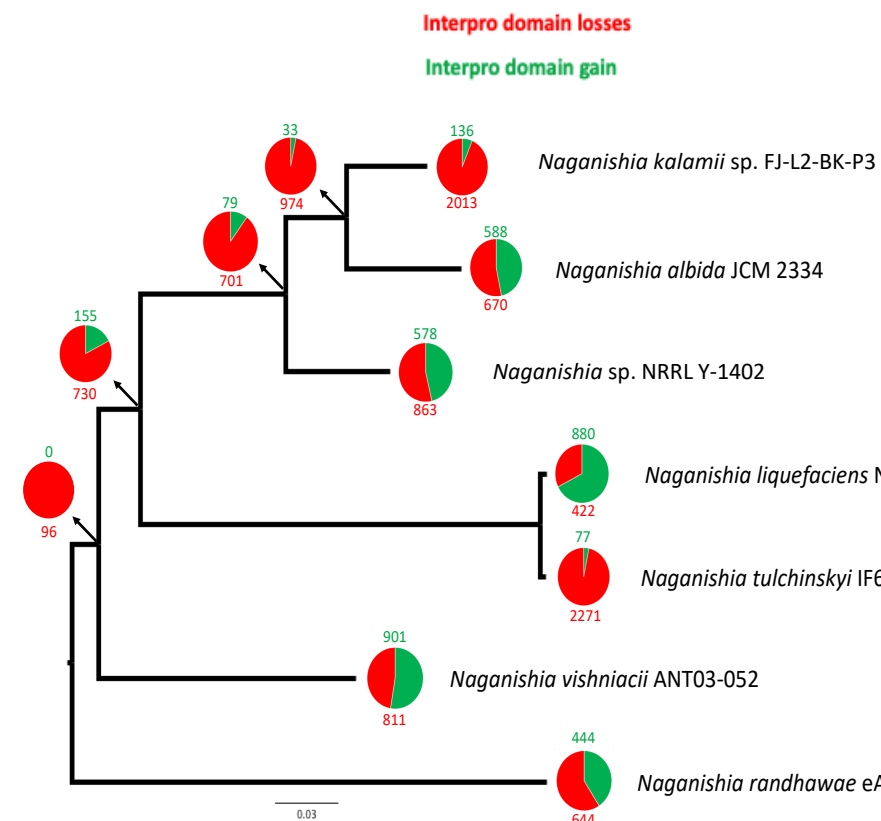


Supplemental Figure SF7. *RPB2*



Supplemental Figure SF8

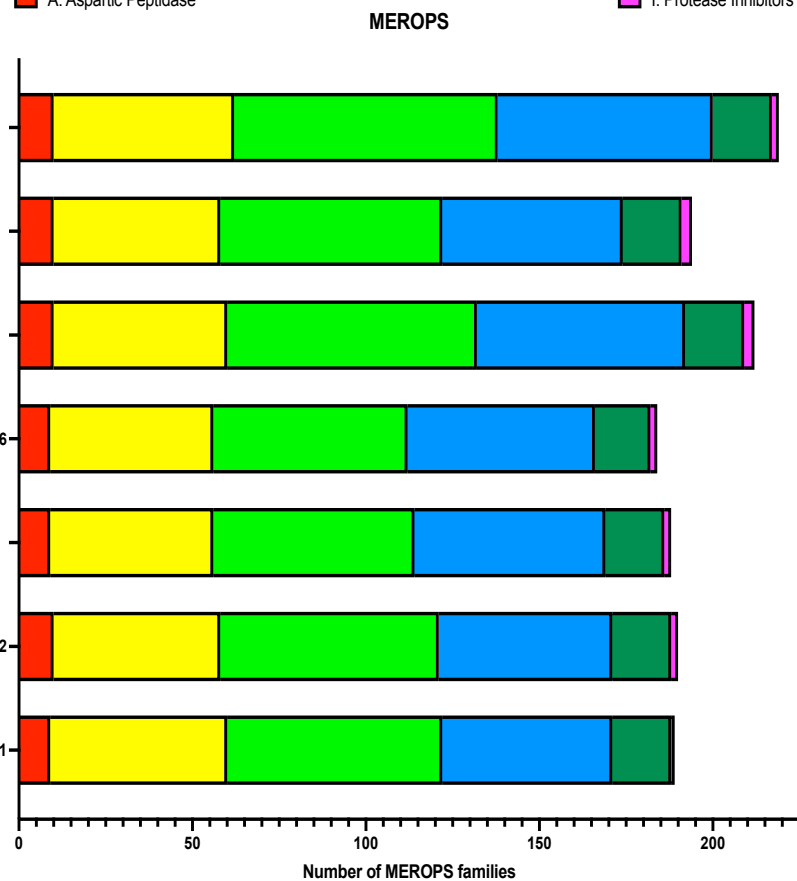
a)



b)

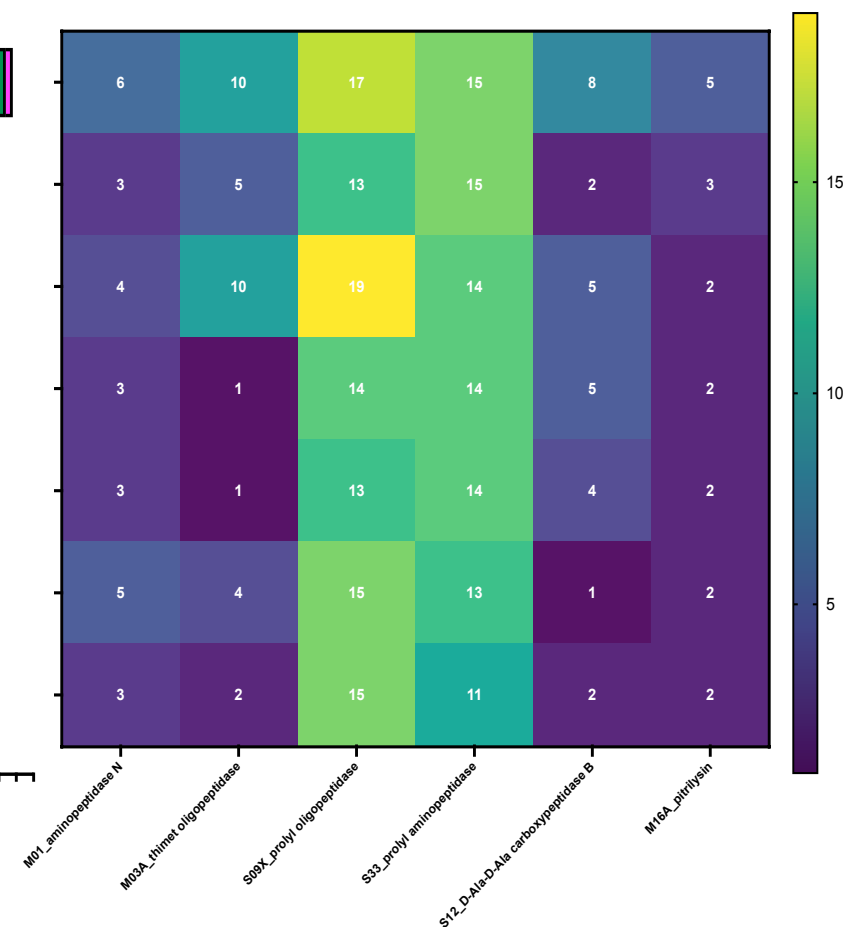
MEROPS – Gene groups

C: Cysteine Peptidase M: Metallo Peptidase S: Serine Peptidase T: Threonine Peptidase
A: Aspartic Peptidase I: Protease Inhibitors

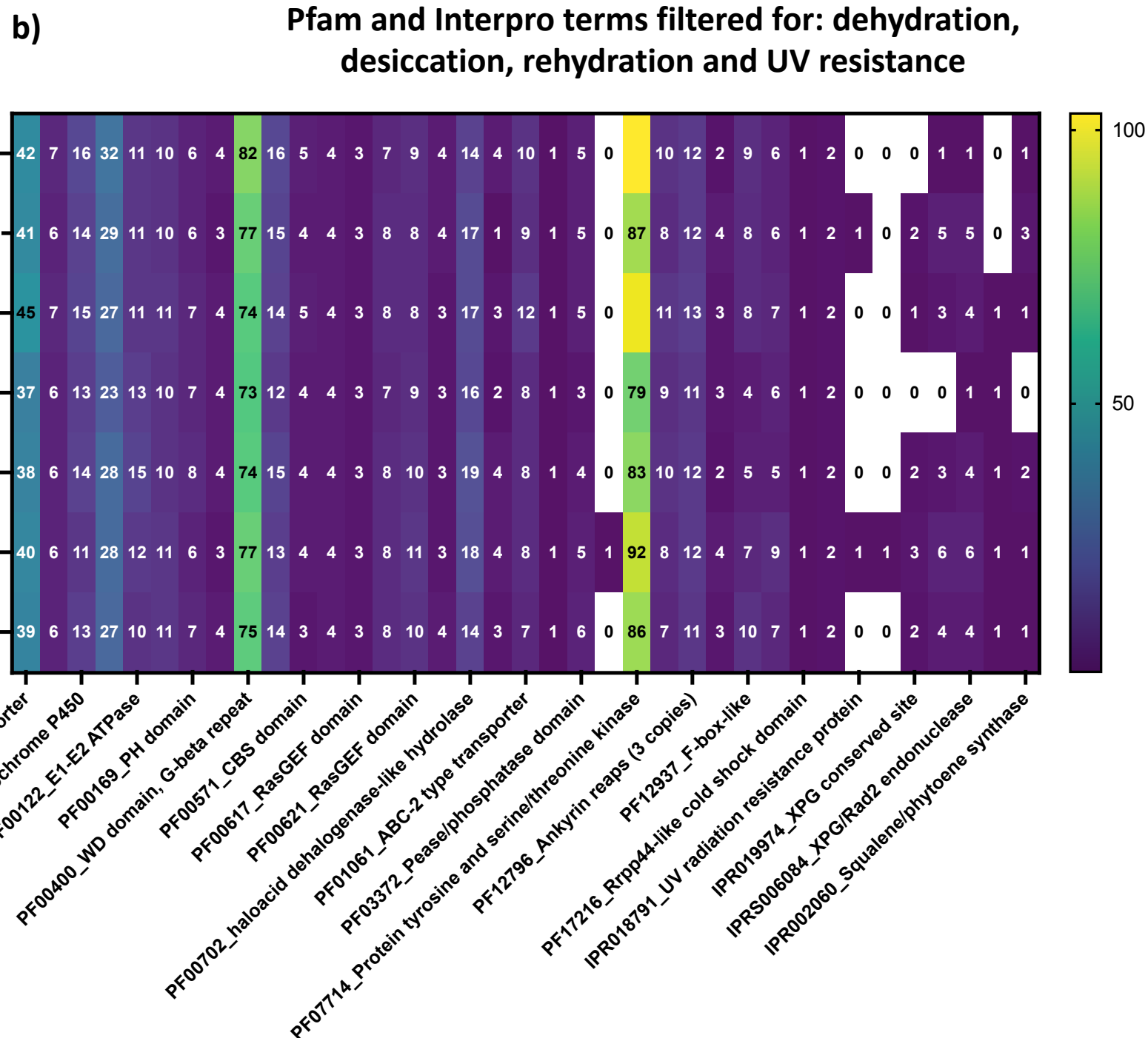
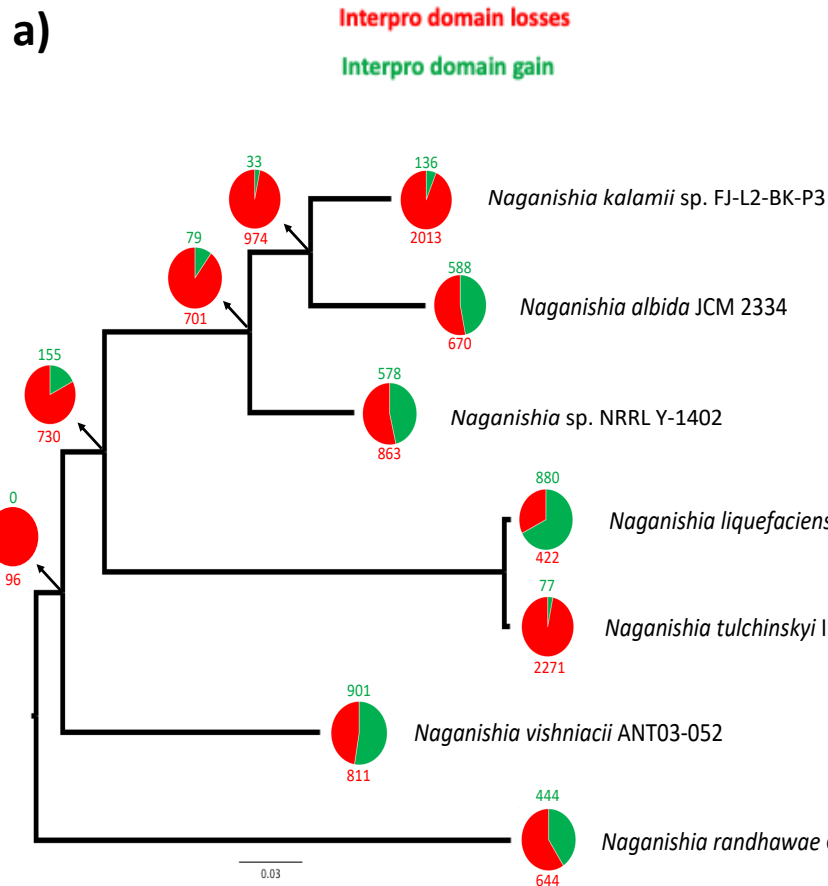


c)

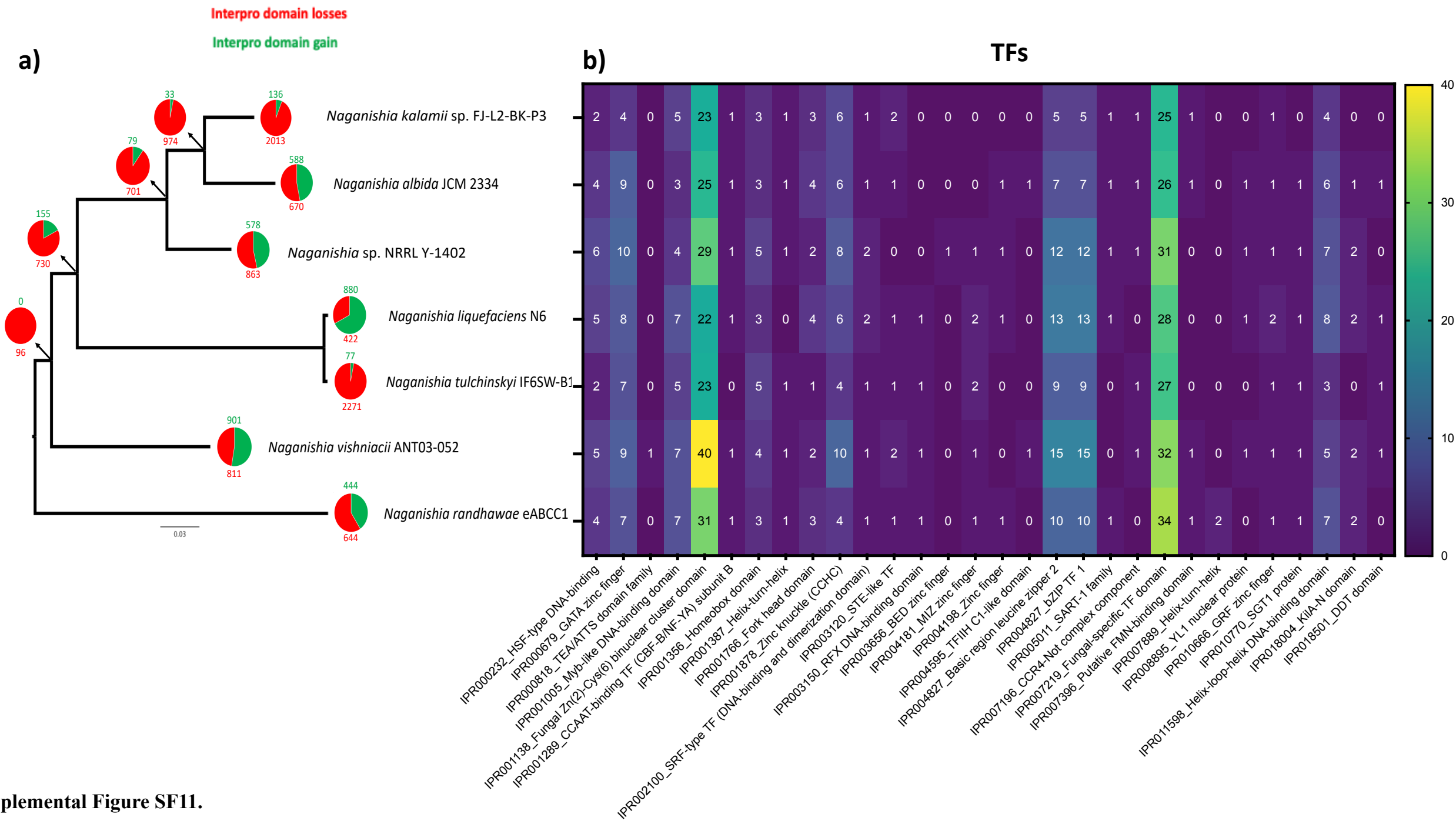
MEROPS - peptidase family and subfamily



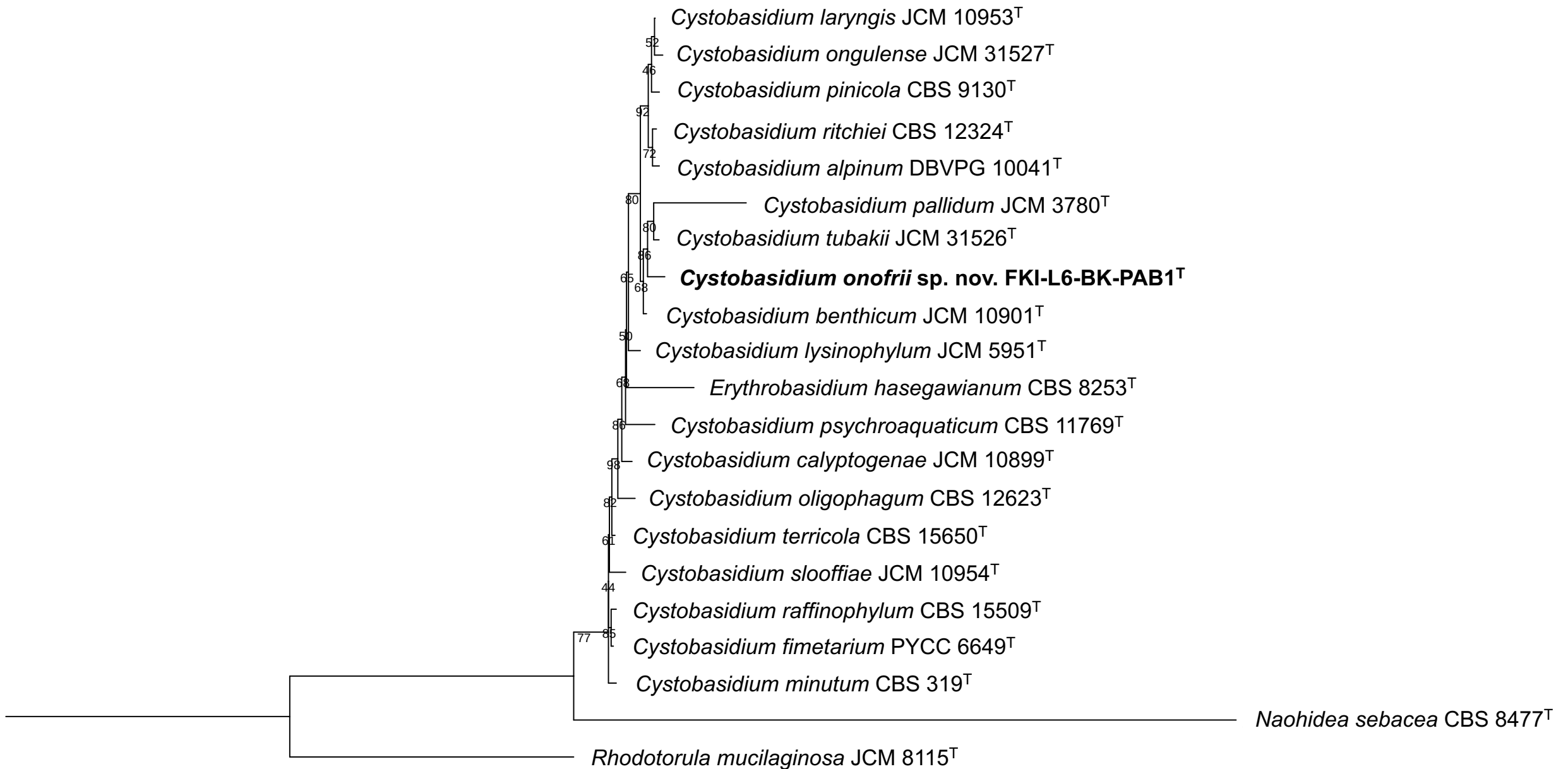
Supplemental Figure SF9.



Supplemental Figure SF10.



Supplemental Figure SF11.



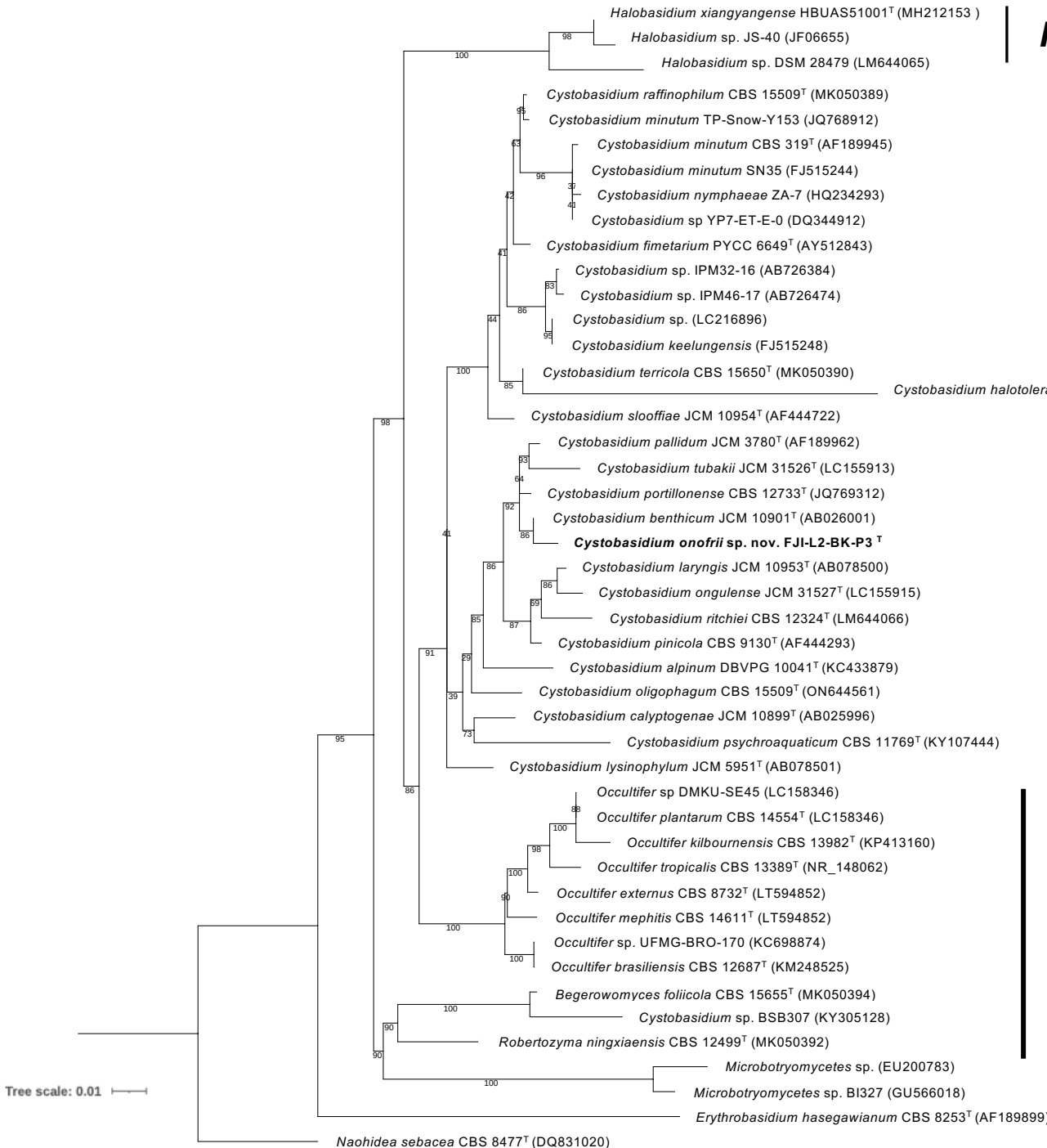
Supplemental Figure SF12. ITS

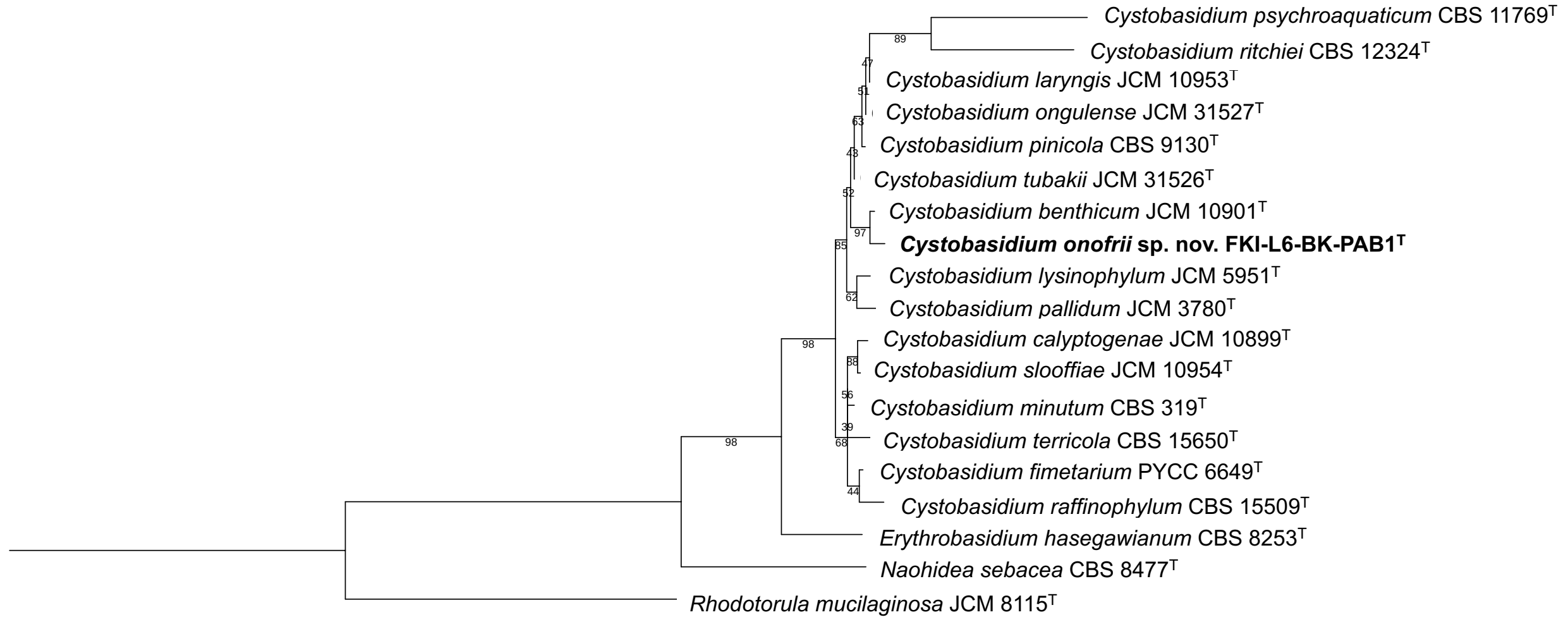
Cystobasidiaceae

Halobasidium

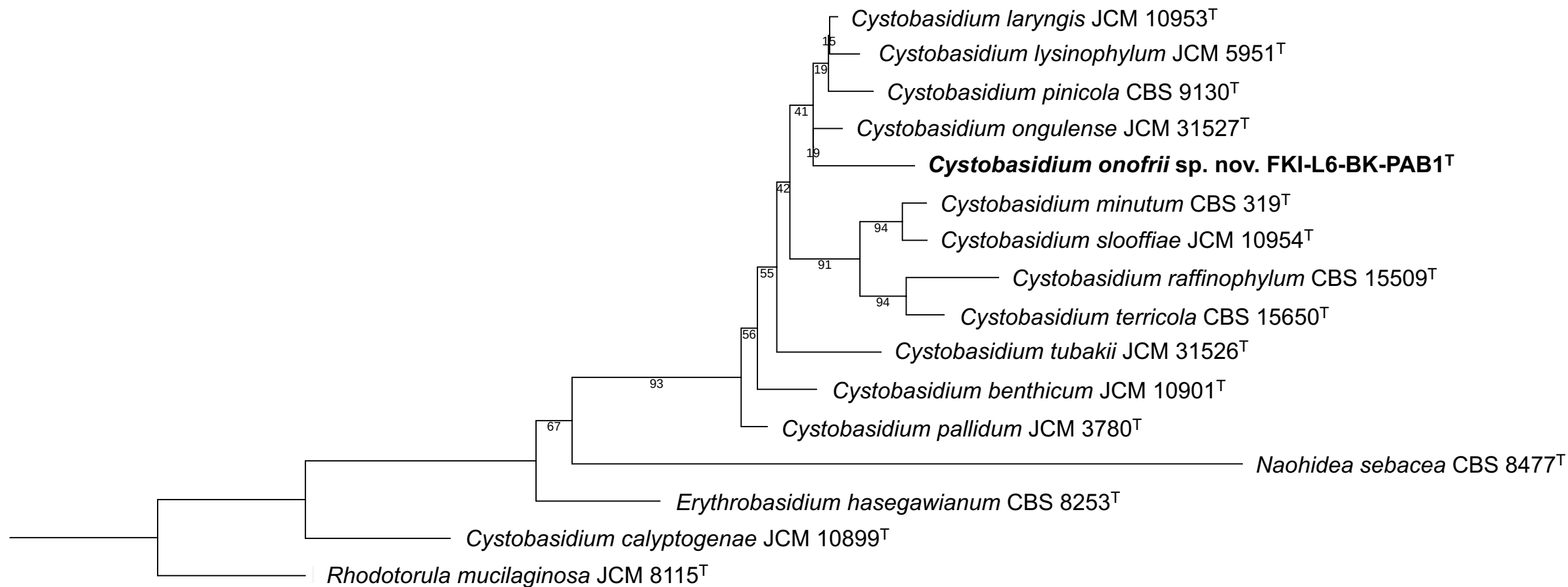
Cystobasidium

Cystobasidiales incertae sedis

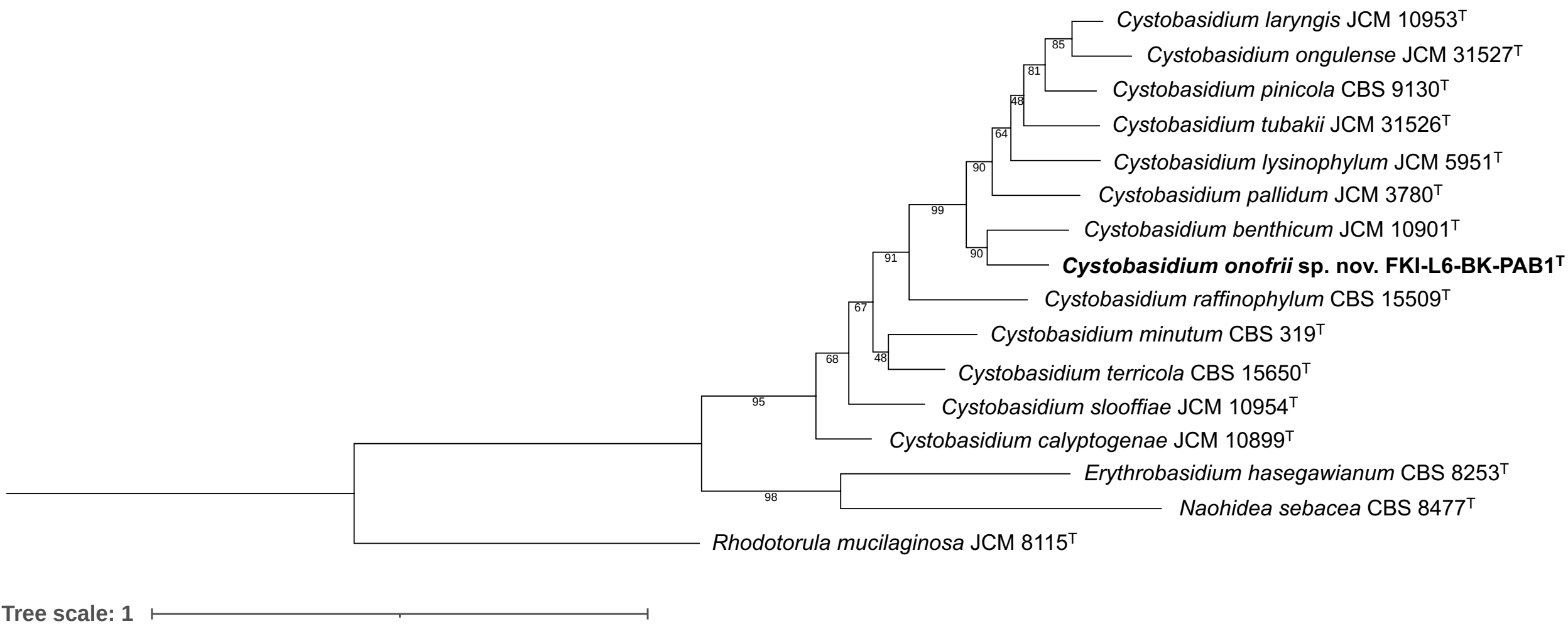




Supplemental Figure SF14. SSU

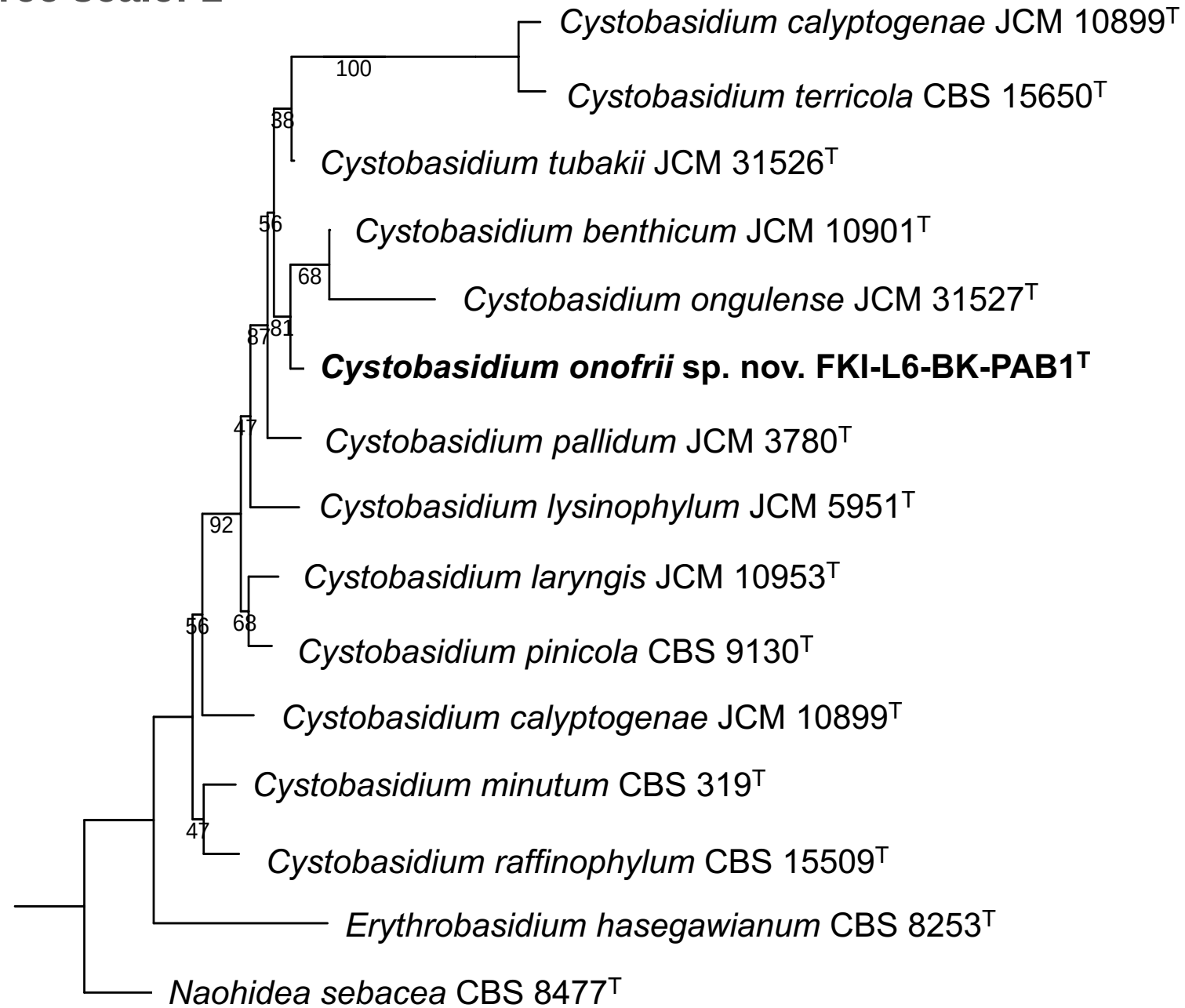


Tree scale: 0.1



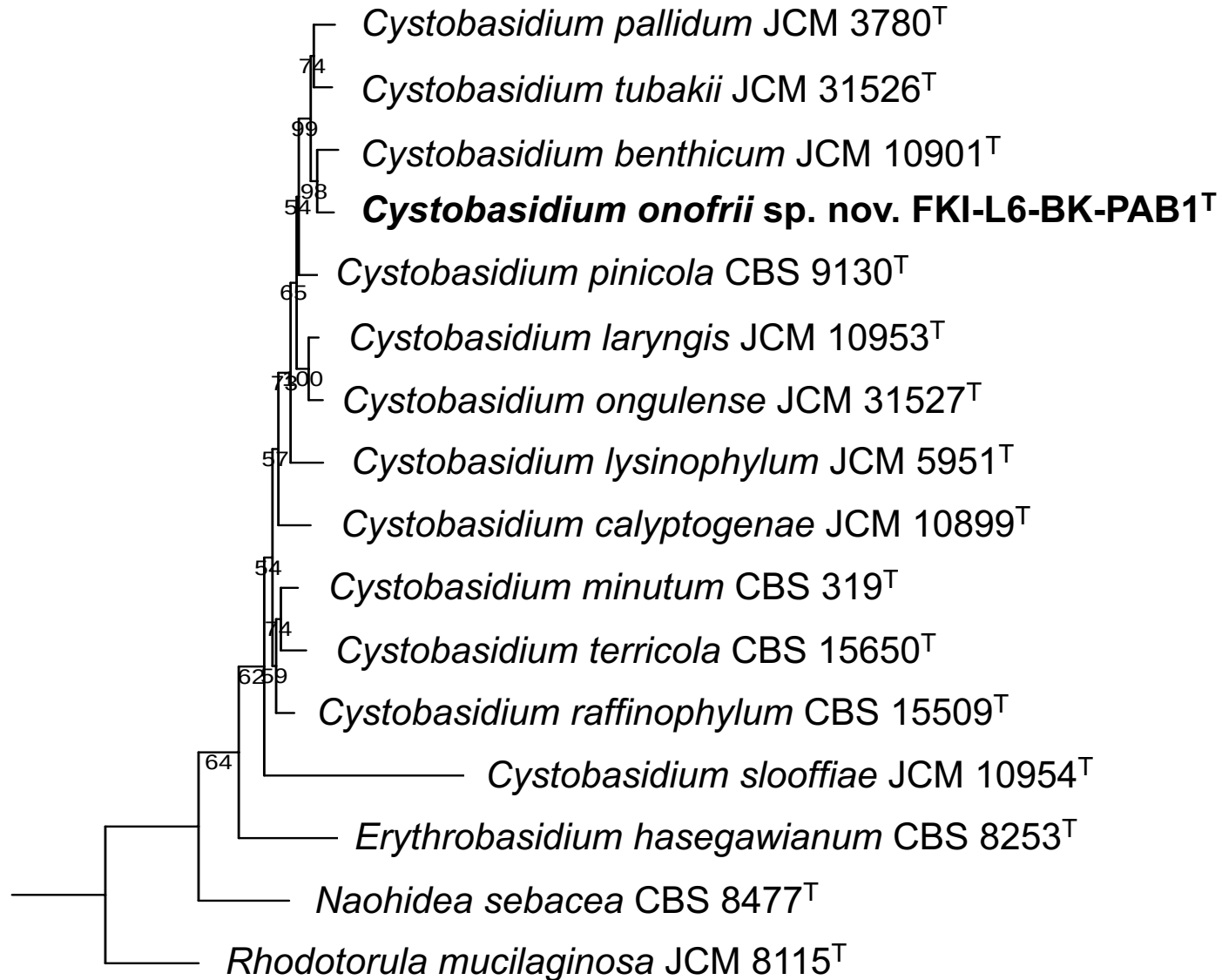
Supplemental Figure SF16. *TEF1*

Tree scale: 1



Supplemental Figure SF17. *RPB1*

Tree scale: 1

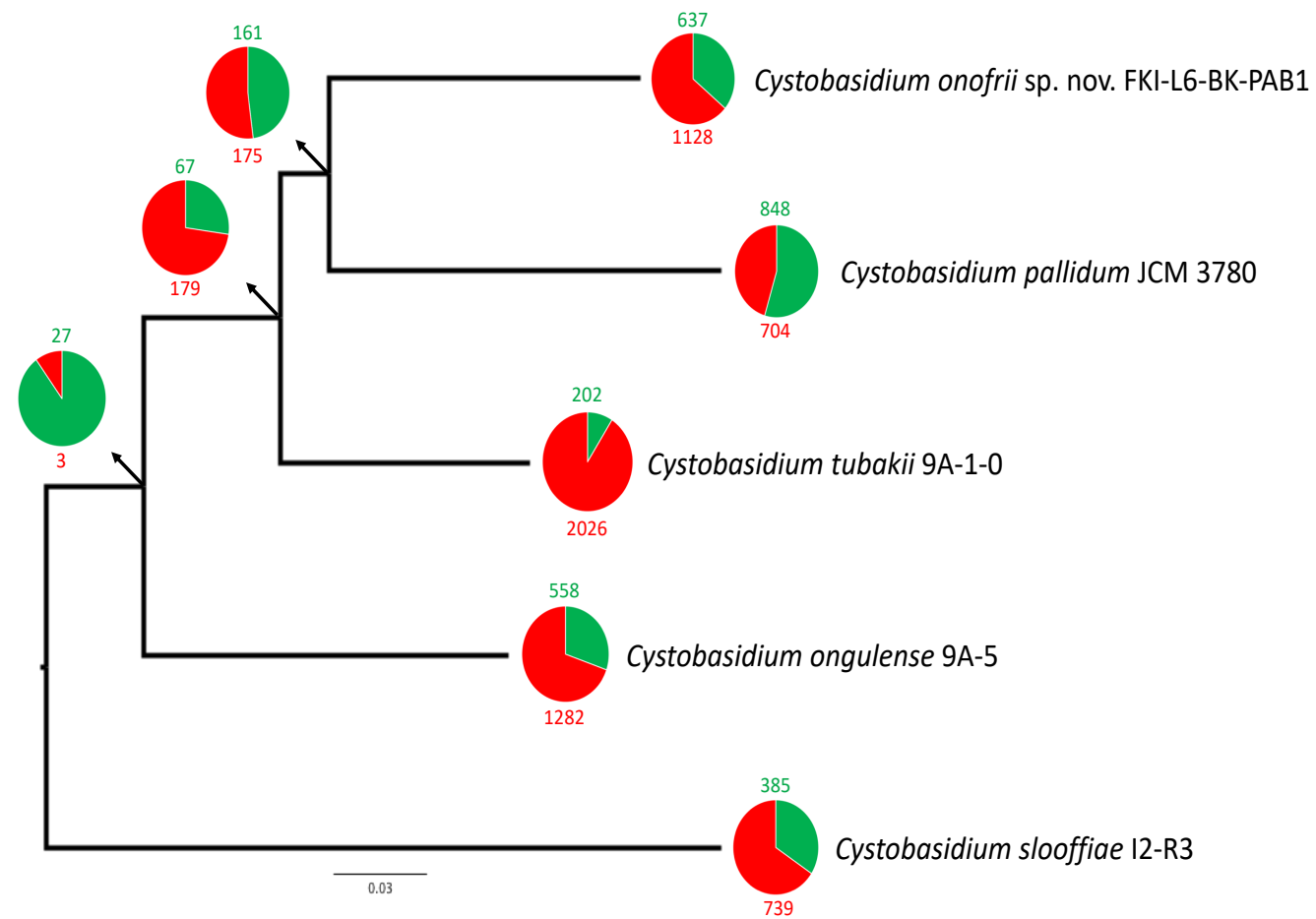


Supplemental Figure SF18. *RPB2*

a)

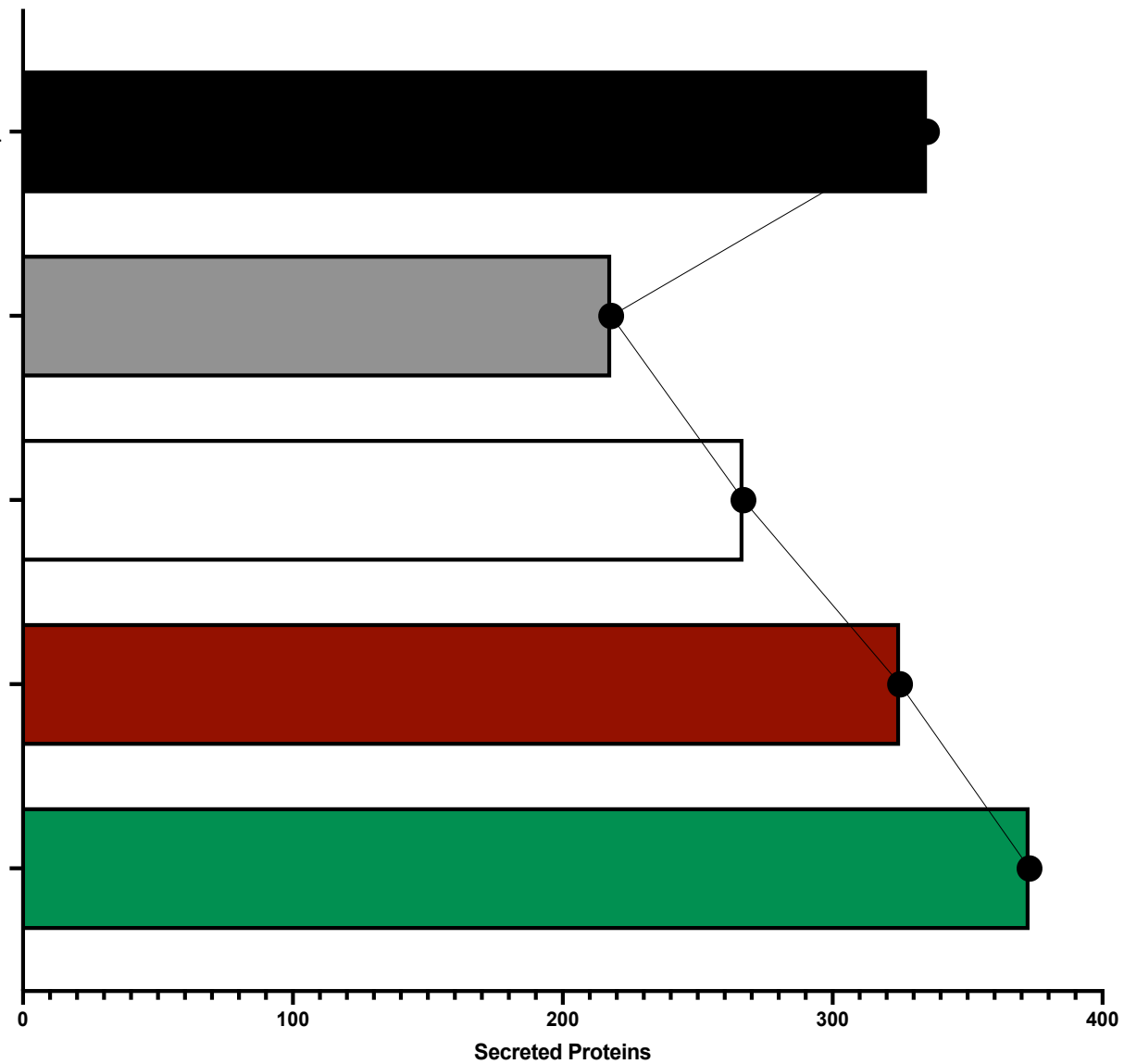
Interpro domain losses

Interpro domain gain

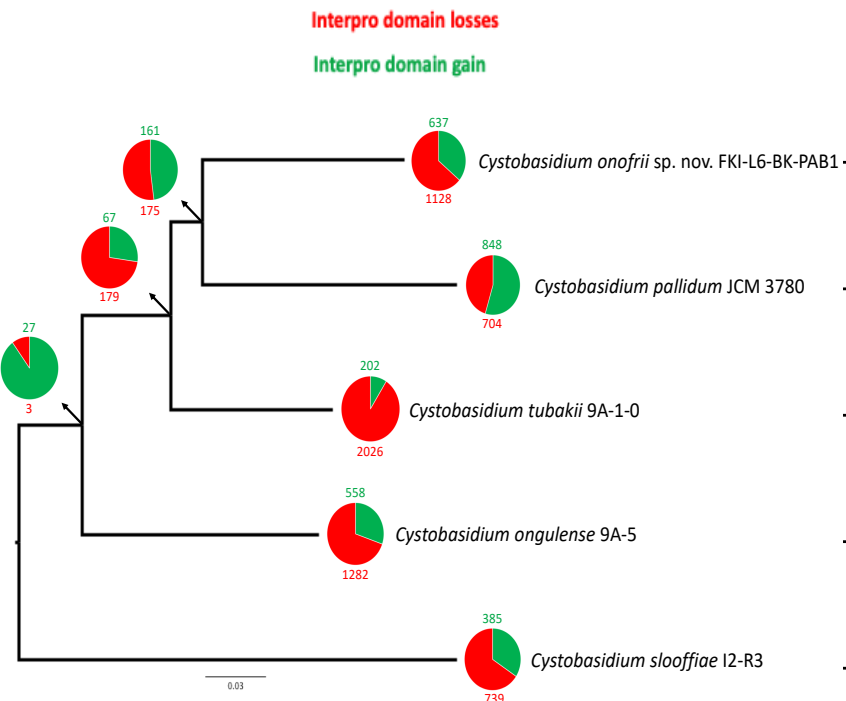


b)

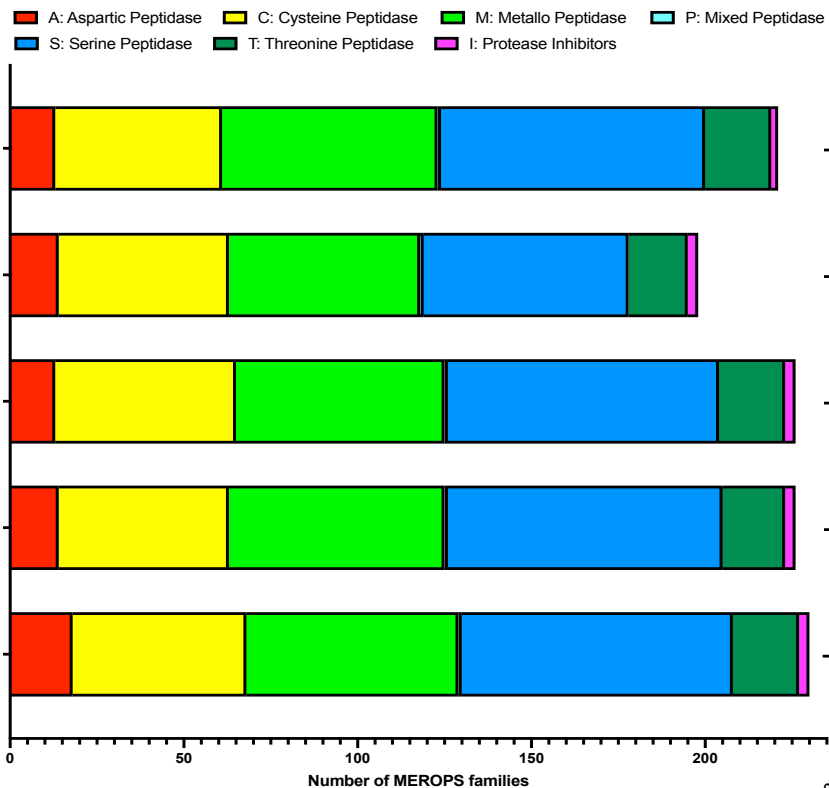
SignalP



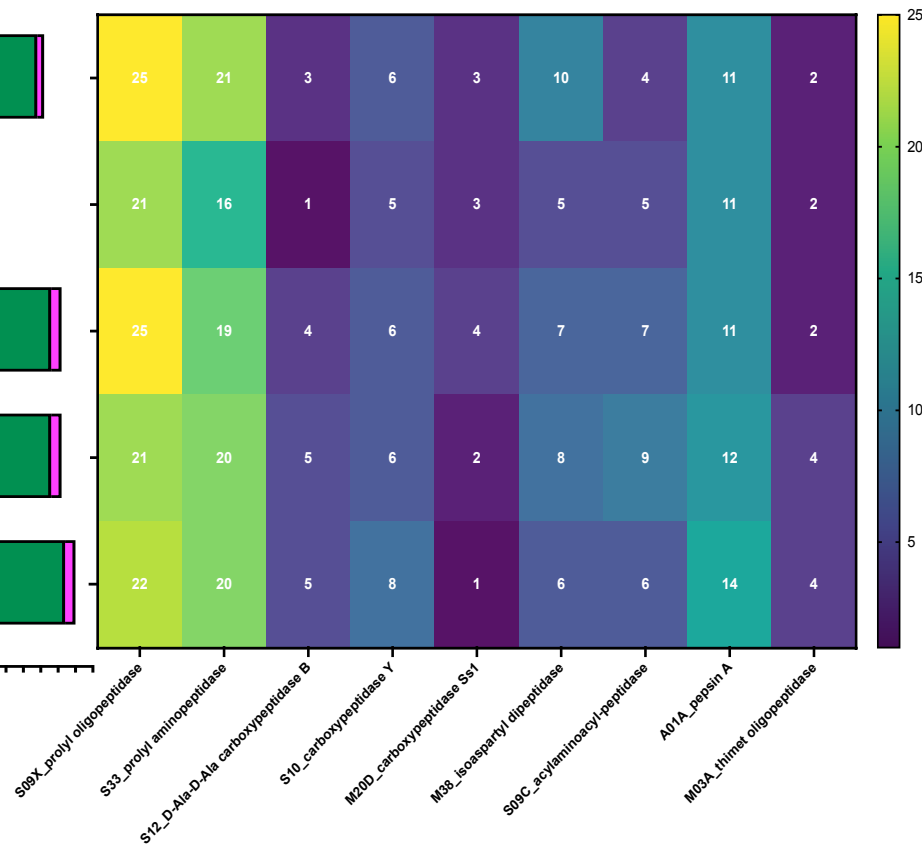
a)



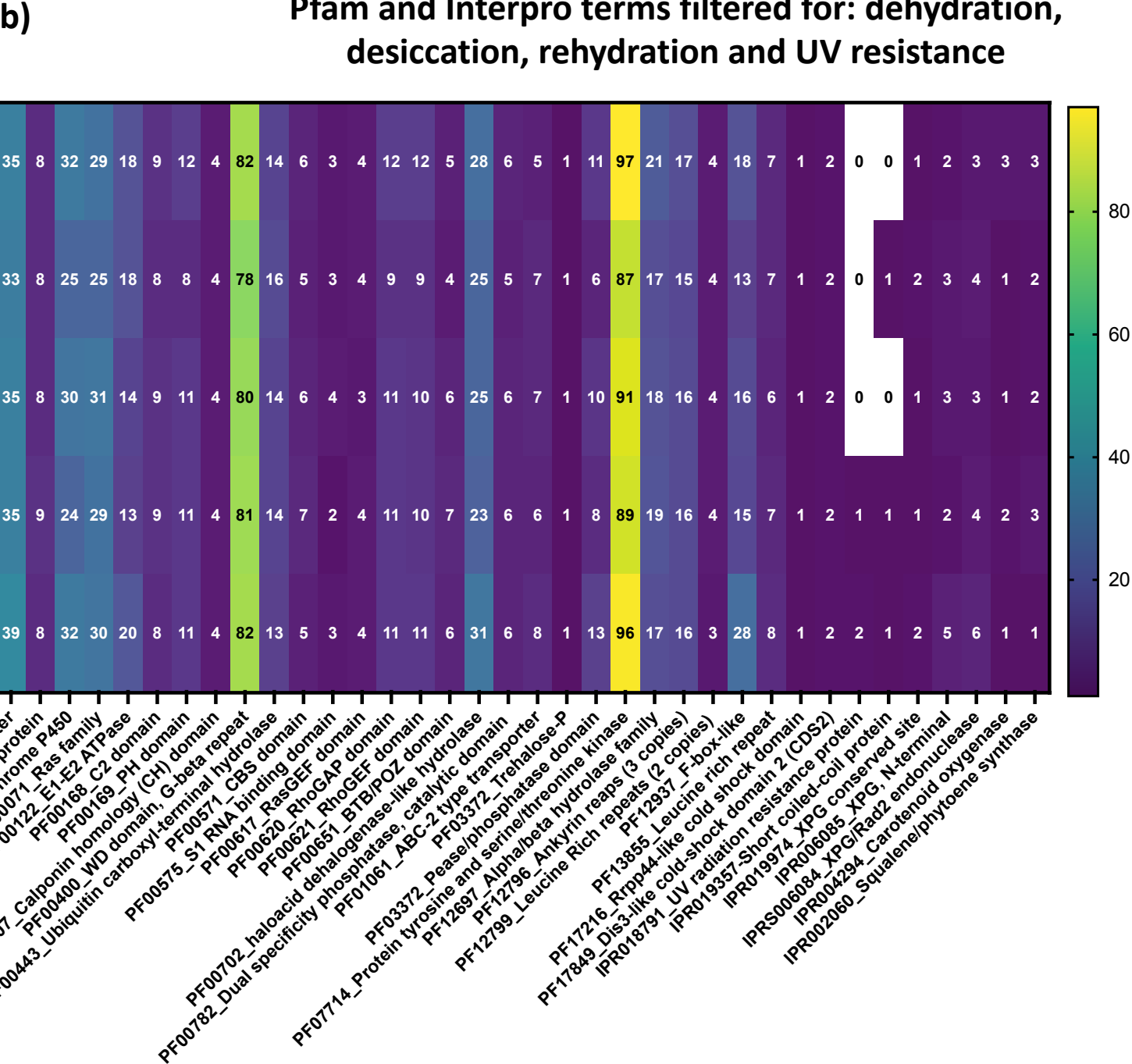
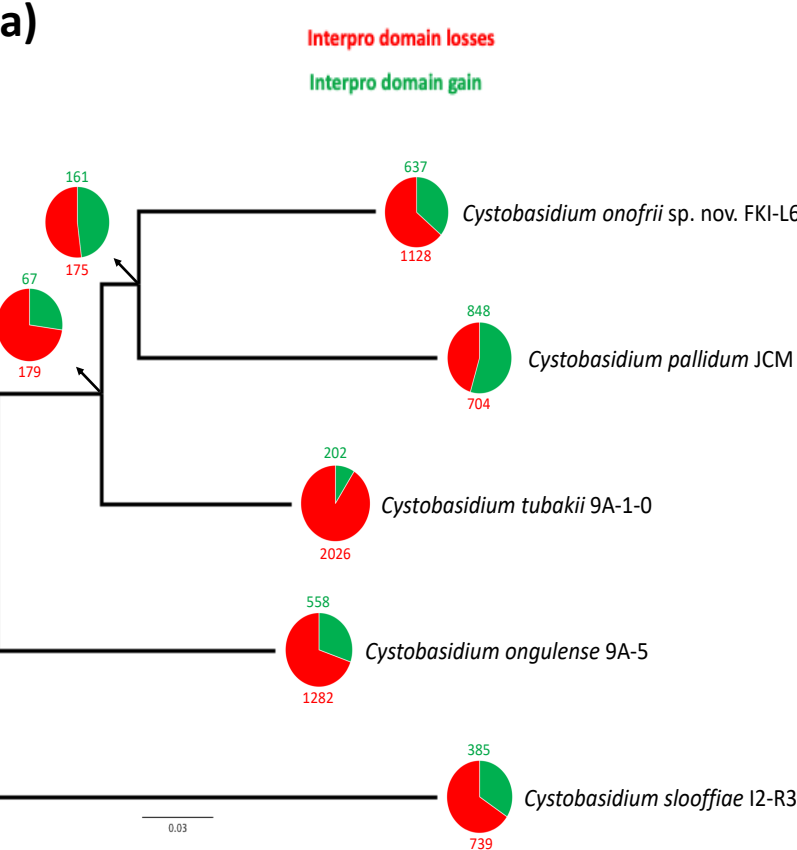
b) MEROPS – Gene groups



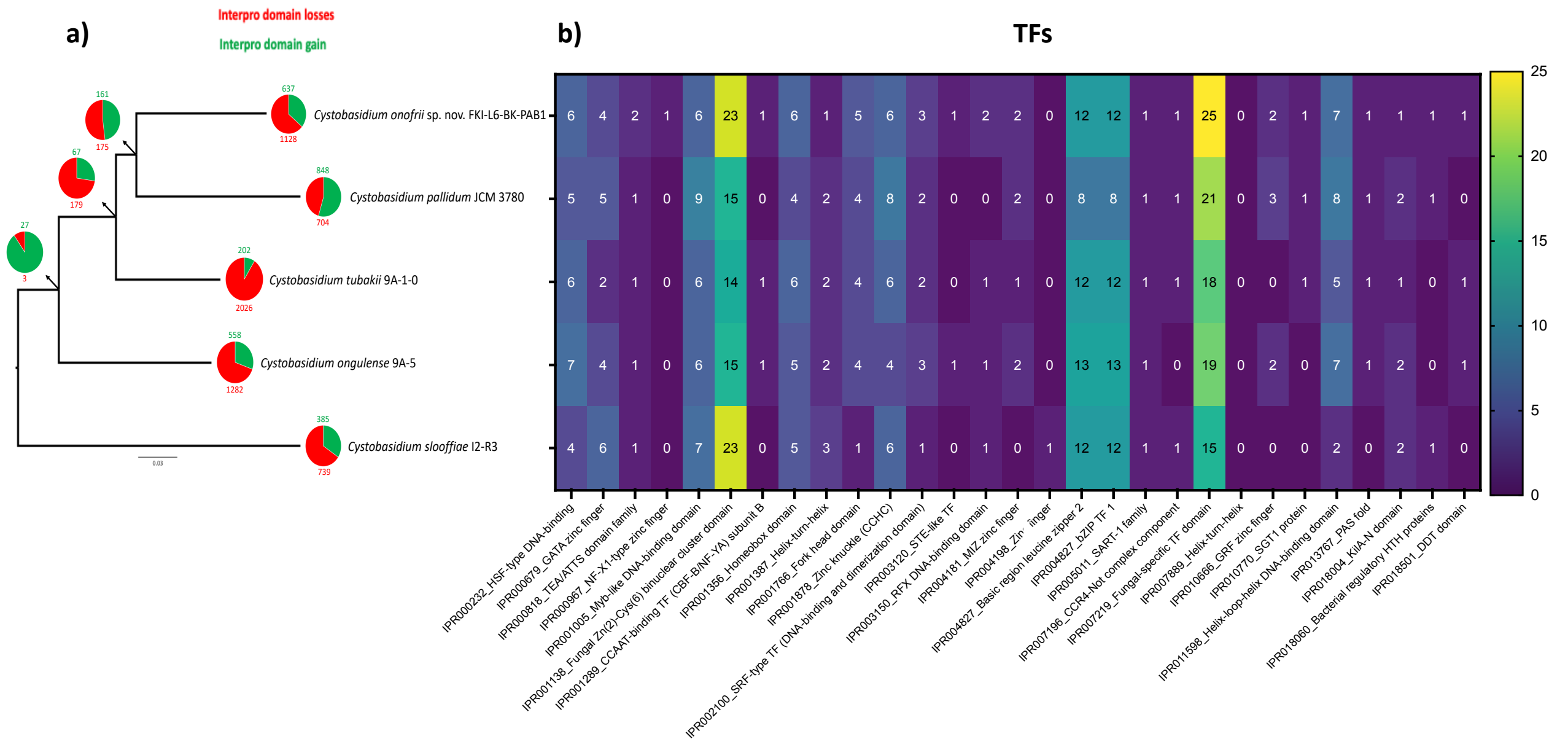
c) MEROPS - peptidase family and subfamily



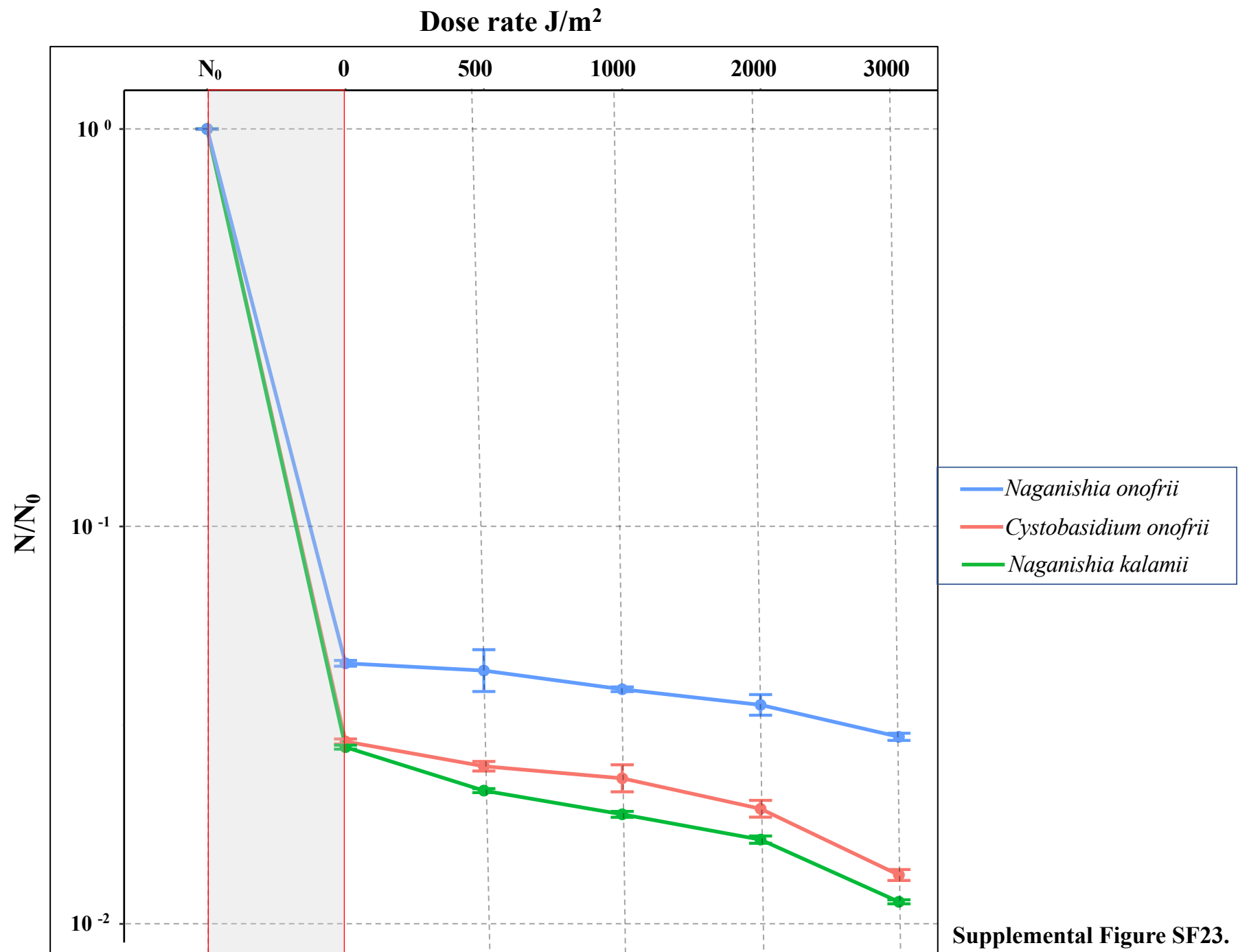
Supplemental Figure SF20.



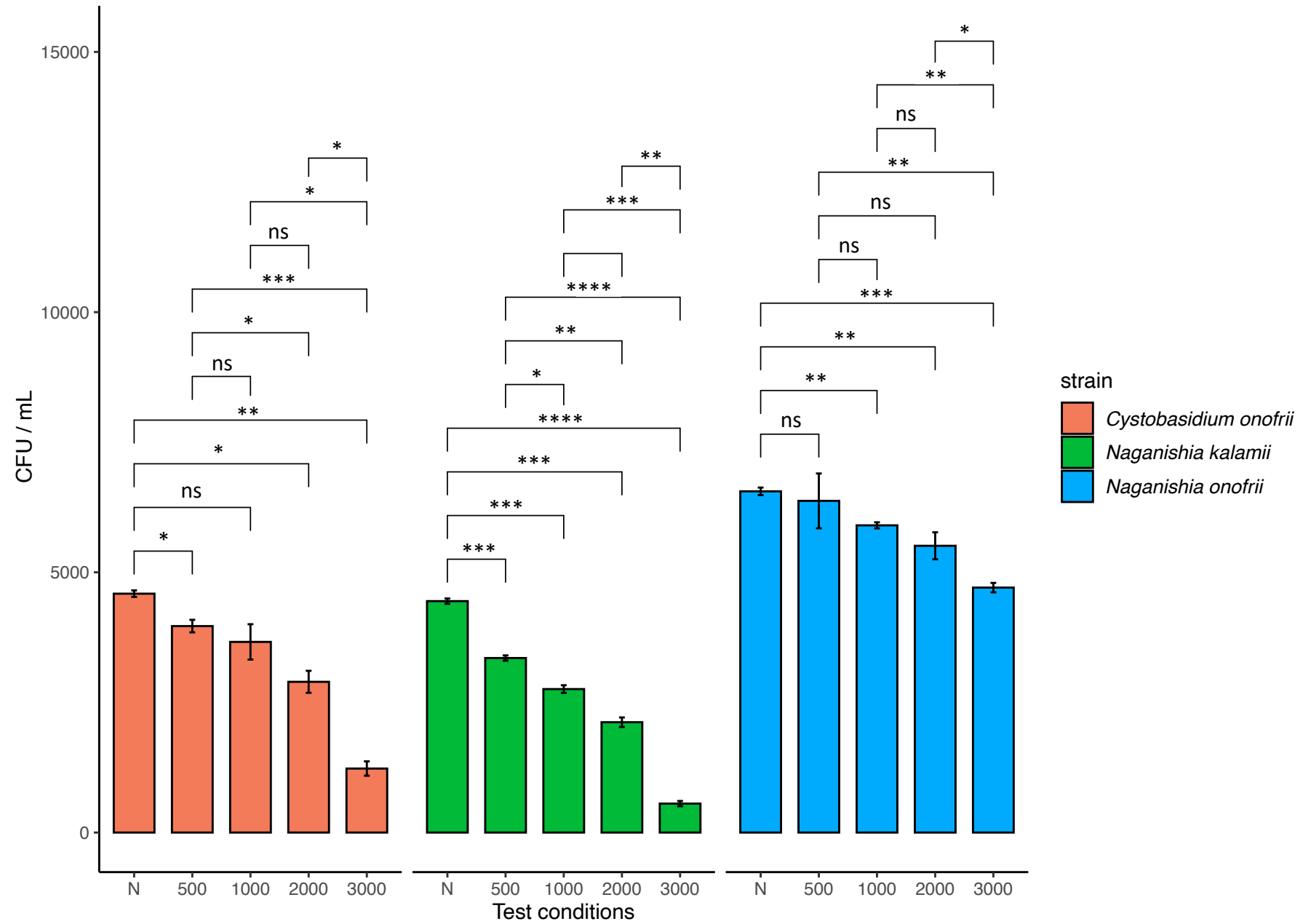
Supplemental Figure SF21.



Supplemental Figure SF22.



Supplemental Figure SF23.



Supplemental Figure SF24.