## Supplementary Information

## SI Material and Methods.

**Taxon and Locus Sampling.** Families were sampled proportionally to their species richness. The Teloschistaceae included 97 species (including potentially new species) and 9 genera. The family Megalosporaceae was represented by five species and 3 genera, and the tropical families Brigantiaeaceae and Letrouitiaceae, by three species each. This sampling represents about 15% of species currently accepted within the Teloschistales and covers most phenotypic diversity within the group. Of the 511 sequences included in this study, 270 were generated anew and 241 were retrieved from GenBank or the WASABI database of AFToL (1) (see Table S3 for voucher and GenBank accession numbers information). DNA extraction, amplification, and sequencing followed (2).

**Alignments and Datasets.** Newly generated sequence fragments were subjected to BLAST searches for a first verification of their identities. They were assembled and edited using DNASTAR Lasergene Core Suite 11 (DNASTAR Inc., Madison, WI), and aligned manually with Mesquite 2.75 (3). The nuclear ribosomal loci were aligned with the help of the secondary structure as described in (2). Ambiguously aligned regions (sensu (4)) and introns were delimited manually and excluded from subsequent analyses. At least three of the six targeted loci were available for all taxa included in this study. The concatenated alignment was deposited in TreeBASE (accession number 18015).

### Phylogenetic Analyses.

*Detecting conflict*: No incongruency was detected among the six loci used in our analyses. Of particular relevance to this study, no incongruence was observed in shorter internodes located deeper in the phylogeny. A conflict was assumed to be significant if two different relationships (one being monophyletic and the other being non-monophyletic) for the same set of taxa were both supported with bootstrap values ≥70% (5). Based on this approach, we initially detected significant conflicts only for a few internodes, and further examination revealed that these were due to misidentification or contamination. When the corresponding five sequences were removed from the dataset, we detected no significant conflict among single-locus trees. We then concatenated the individual alignments to form one conflict-free dataset.

*Bayesian and maximum likelihood analyses*: In the Bayesian analyses, the AIC in MrModeltest 2.3 (6) was used to choose the model of molecular evolution. Prior distributions were as in (2). Two analyses of four chains were run for 50 M using MrBayes 3.2.2 (7), with trees sampled every 500 generations. Log-likelihood scores were plotted against generation time with Tracer v1.6 ((8); http://beast.bio.ed.ac.uk/Tracer) and assigned stationarity when they reached a stable equilibrium

value (9), when the average standard deviation of split frequencies (ASDSF) across runs dropped below 0.01, and the potential scale reduction factor (PSRF) of the parameters and branch lengths was equal or close to 1. This was also verified with the AWTY program, http://ceb.csit.fsu.edu/awty, (10). A burn-in sample of 30,000 trees was discarded for each run. The remaining 140,000 trees were used to estimate branch lengths and posterior probabilities.

Maximum likelihood analysis was computed in RAxML with the same partitions as in Bayes (Table S4) but with *RPB*1 and *RPB*2 1st and 2nd codons unlinked, a GTRGAMMA model of nucleotide substitution, and 1,000 replicates.

*Classification of the Teloschistaceae*: As discussed in the main text, the taxonomy of this group of lichens, especially the family Teloschistaceae, has been habitually highly controversial. In the last years, several alternative classifications have been proposed including new and resurrected genera (e.g., (11, 12)). Regardless of exceptional efforts to cover a broad taxon sampling in some of these studies (e.g., (11)), they have (a) relied on only one to three ribosomal RNA-coding genes, (b) failed to find strong support for several of the newly delimited genera as monophyletic, and (c) disagreed over many generic circumscriptions, showing a lack of consistency. Although the present 6-gene phylogeny brings significant levels of support for a number of clades, a complete reassessment including phenotypic information and a thorough revision of all current available names are urgently needed to procure a more secure and stable nomenclature at the generic level. While we plan to address this complex issue in a forthcoming study, on the grounds of simplicity and practicality we have used here the traditional generic names for the group, recently included in a 'without-prejudice' list of generic names of fungi for protection under the International Code of Nomenclature (13), being aware that their current circumscription is polyphyletic in some cases.

**Dating Analyses.** Settings for the two analyses used in this study are described below.

*Eukaryotes dataset*: A five-gene dataset (*RPB*1, *RPB*2, *EF*1a, nrLSU, and nrSSU) was assembled to comprise 8,324 characters and 114 taxa, including 13 species of Teloschistales and 101 taxa representing all main groups of fungi as well as several plants, animals, and protists. We used a Bayesian approach to estimate divergence times as implemented in the software package BEAST v.1.7.4. Input files were prepared using BEAUti (14). A randomly generated starting tree was used, but several nodes were constrained as monophyletic (see Table S5) based on previous results (15). The nucleotide substitution model was set to GTR + Gamma + Invariant sites, with simultaneously estimated base frequencies, four gamma categories, and five gene partitions as well as partitions for the three codon positions of *RPB*1, *RPB*2, and *EF*1a. For the clock, we used an uncorrelated log normal model, with simultaneously estimated rates. We used a Yule tree prior, which assumes a constant speciation rate per lineage. Calibrations were set as prior distributions as described in (15), with few minor modifications (Table S6). The analysis was run for 40 M

generations and parameters were sampled every 1,000 generations. The software Tracer v.1.6 was used to analyze the trace files (8). Trees were annotated using TreeAnnotator v.1.7.5 with a burnin of 10,000 trees (14) and visualized in FigTree v.1.4.2 (http://tree.bio.ed.ac.uk/software/figtree; Fig. S6).

*Teloschistales dataset*: A six-locus dataset [*RPB*1, *RPB*2 (two amplicons), 5.8S, mtSSU, and nrLSU] was assembled to obtain a chronogram (Fig. S1). This dataset included 4,643 characters and 108 taxa belonging to Teloschistales. The dataset was partitioned into five gene regions as well as three codon positions for both *RPB*1 and *RPB*2. The nucleotide substitution model was the same as in the eukaryotes dataset. We used an uncorrelated log normal model for the clock and a Yule tree prior for the speciation rate per lineage. Calibrations were set as priors using normal distributions. The nine deepest nodes (node A-I; Figs. S1, S6) were calibrated as described in Table S7. Analysis were run and examined as for the eukaryotes dataset. Resulting age estimates for selected nodes are shown in Table S8.

**Testing for Shifts in Diversification Rates.** We performed multiple BAMM runs with four chains on the Teloschistales maximum clade credibility tree (MCCT), with 10 M generations of Markov Chain Monte Carlo (MCMC) sampling per run and evolutionary parameters sampled every 10,000 generations. We assessed convergence of BAMM runs by computing effective sample sizes of log-likelihoods, numbers of shifts, and evolutionary rate parameters using the CODA library in R; all parameters had effective sample sizes > 500. We reconstructed marginal distributions of net diversification rates for each branch in the MCC Teloschistales phylogeny using the posterior distribution of evolutionary parameters sampled using the rjMCMC algorithm in BAMM. We simulated prior shifts in order to compute Bayes Factors. We set a conservative prior of 1 for rate shifts under the compound Poisson process (poissonRatePrior), and constrained the location of possible rate-change events to occur only on branches with at least 10 descendant tips. We implemented the 'time-flip' proposal (time-constant and time-variable shifts) to avoid potential biased inference on speciation in some areas of the parameter space; rate shifts will lead to a constant-rate diversification process (MEDUSA-like) unless the data contains sufficient evidence for temporally varying macroevolutionary rate dynamics. According to the authors this model improves BAMM performance (see http://bamm-project.org/time-flip.html).

**Ancestral Character State Estimations.** The settings used in the different methods implemented in the ancestral character state estimation of binary traits were the following: 1) a Bayesian approach with BayesTraits (http://www.evolution.reading.ac.uk/BayesTraits.html) across a random subset of 500 post-burnin dated trees from the BEAST output. The Multistate Markov model was implemented to determine probabilities of character state change on each branch. Analyses were run for 10 M MCMC iterations, with 5 M as a burnin and trees sampled every 1,000

generations. Runs were carried out at least twice in order to check for convergence. In addition, we compared performance among three sets of analyses implementing a reversible-jump (RJ) MCMC on an unconstrained model, an unconstrained model without RJ, and a constrained model with forward (q01) and backward (q10) transition rates set to equal, without RJ. In all implementations we used hyper priors for discrete rate parameters. We tested for different intervals (0 0.01 to 0 100) with hyper exponential and hyper gamma priors on all parameters. Harmonic means (HMEs) and Bayes Factors (BFs) were compared between analyses. Best-fit models were selected on the basis of BF > 2. Reconstructions were implemented with a MRCA approach. In all traits, BayesTraits supported a constrained model over a Reverse jump and a hyper prior unconstrained, with transition rates set to equal and a hyper exponential prior on all parameters drawn from a uniform with different ranges depending on the trait (Table S9). These analyses accounted for phylogenetic uncertainty. 2) A maximum likelihood approach with BiSSE (16); implemented in diversitree 0.9-2 package (17), using marginal reconstructions and the model selected in the diversification analyses described in the main text. After assessing several sampling regimes in BiSSE, we estimated the reconstructions for a 10% taxon sampling as the most realistic scenario in all traits. 3) A maximum likelihood approach with the *corHMM* function contained within the R package *corHMM* (18, 19), using marginal reconstructions, considering a '*hidden rates model*' (HRM), and testing for different numbers of hidden rate classes for the evolution of traits. Several random starts were performed, different initial values used for the likelihood search (ip = 0.001 to 1), and root was set to 'maddfitz' to implement the same procedure as in (16) and (20). Model fit was assessed by comparing AICc values. A 2-rate model of phenotypical evolution clearly outperformed a 1-rate model only for the shade character (Table S10). We used *corHMM* under a 1-rate model as a simple maximum likelihood reconstruction.

**Testing for State-Dependent Diversification Rates.** We implemented a full 10-parameter BiSSE-ness model (21), a 9-parameter model where the probability of character change at speciation is p0c = 0, an 8-parameter model where p0c = p1c, an 8-parameter with speciation and extinction rates constrained to equal independently of the state, and a 6-parameter model with one speciation and extinction rates and p0c = p1c. We used AIC scores to compare these models and we examined all BiSSE and BiSSE-ness models with different taxon sampling scenarios, with assumptions that we had sampled from 10% up to 90% of the taxa within the Teloschistaceae.

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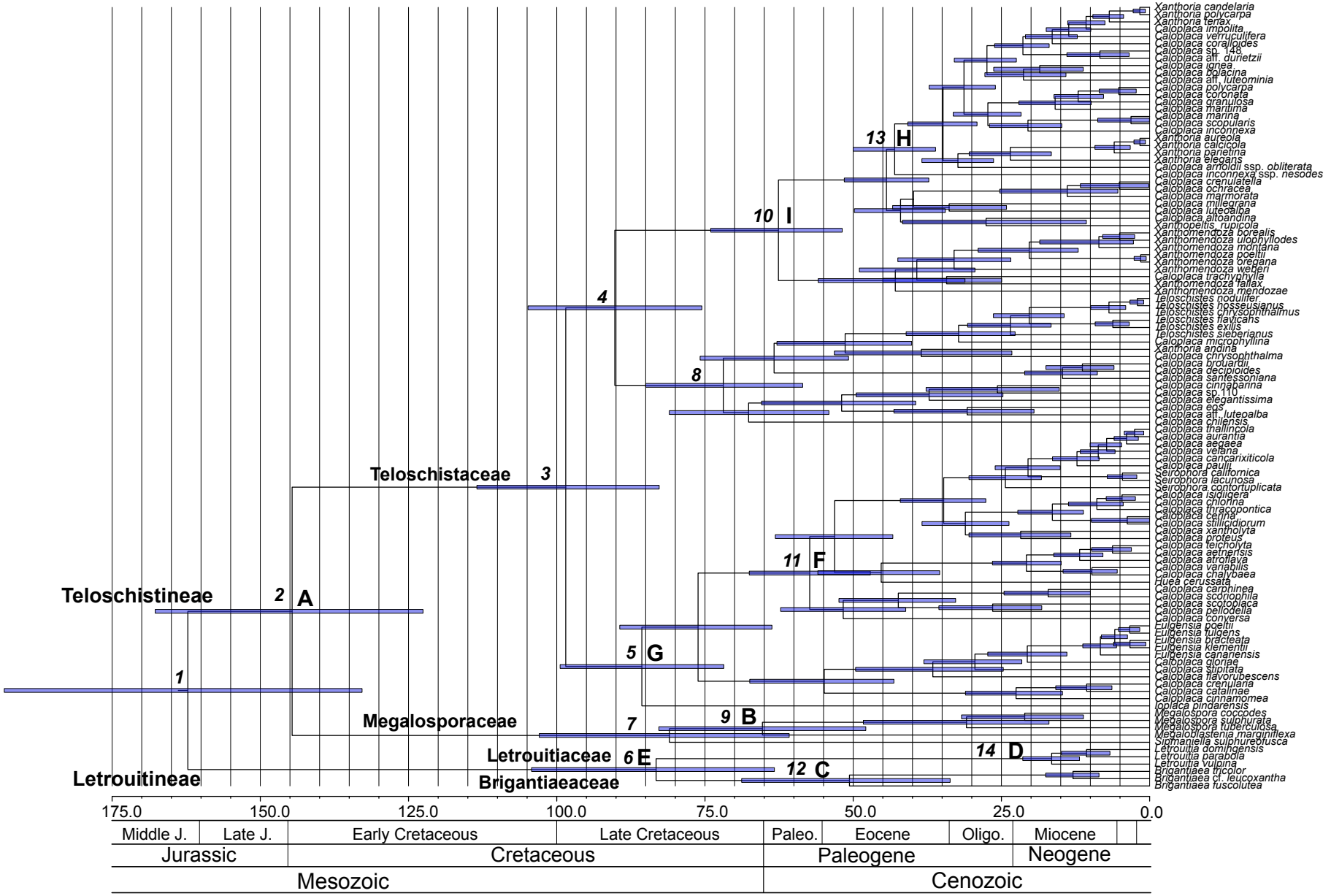



**Fig. S1.** Chronogram picturing divergence time estimates for 108 taxa of the order Teloschistales obtained using a six-locus dataset (*RPB*1, *RPB*2 – two amplicons, 5.8S, mtSSU, and nrLSU). Bars correspond to 95% confidence intervals. The nine nodes marked with letters A-I correspond to the secondary calibrations obtained from the eukaryotes analyses (Fig. S6) as described in Table S7. Means and confidence interval values for nodes labeled 1-14 are shown in Table S8.

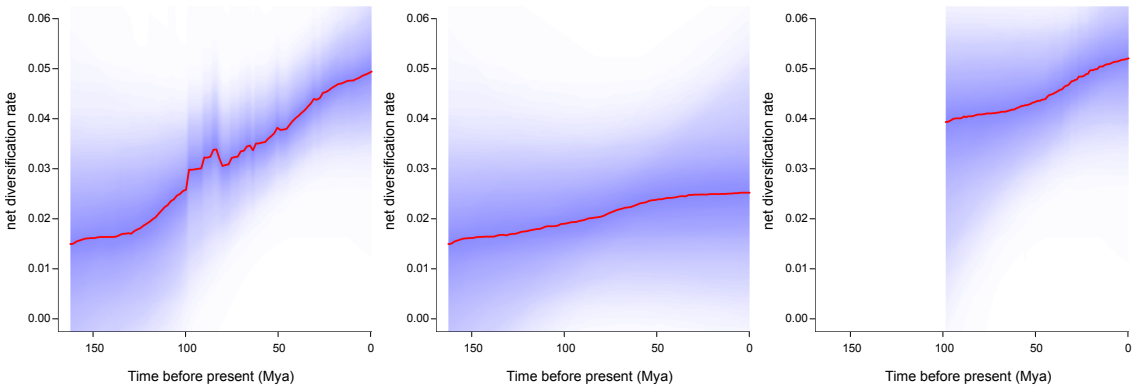



**Fig. S2**. Temporal dynamics in net diversification rates computed from the joint posterior density of macroevolutionary rate parameters simulated using the reversible jump MCMC algorithm in BAMM. Left graph shows overall mean rates through time for the Teloschistales (red line), with blue color density shading denoting confidence on evolutionary rate reconstructions at any point in time (10% through 90% Bayesian credible regions on the distribution of rates through time). Middle graph shows the rate-through-time estimates for the tropical Letrouitineae and Megalosporacea alone. Right-hand graph shows the rate for the Teloschistaceae alone.

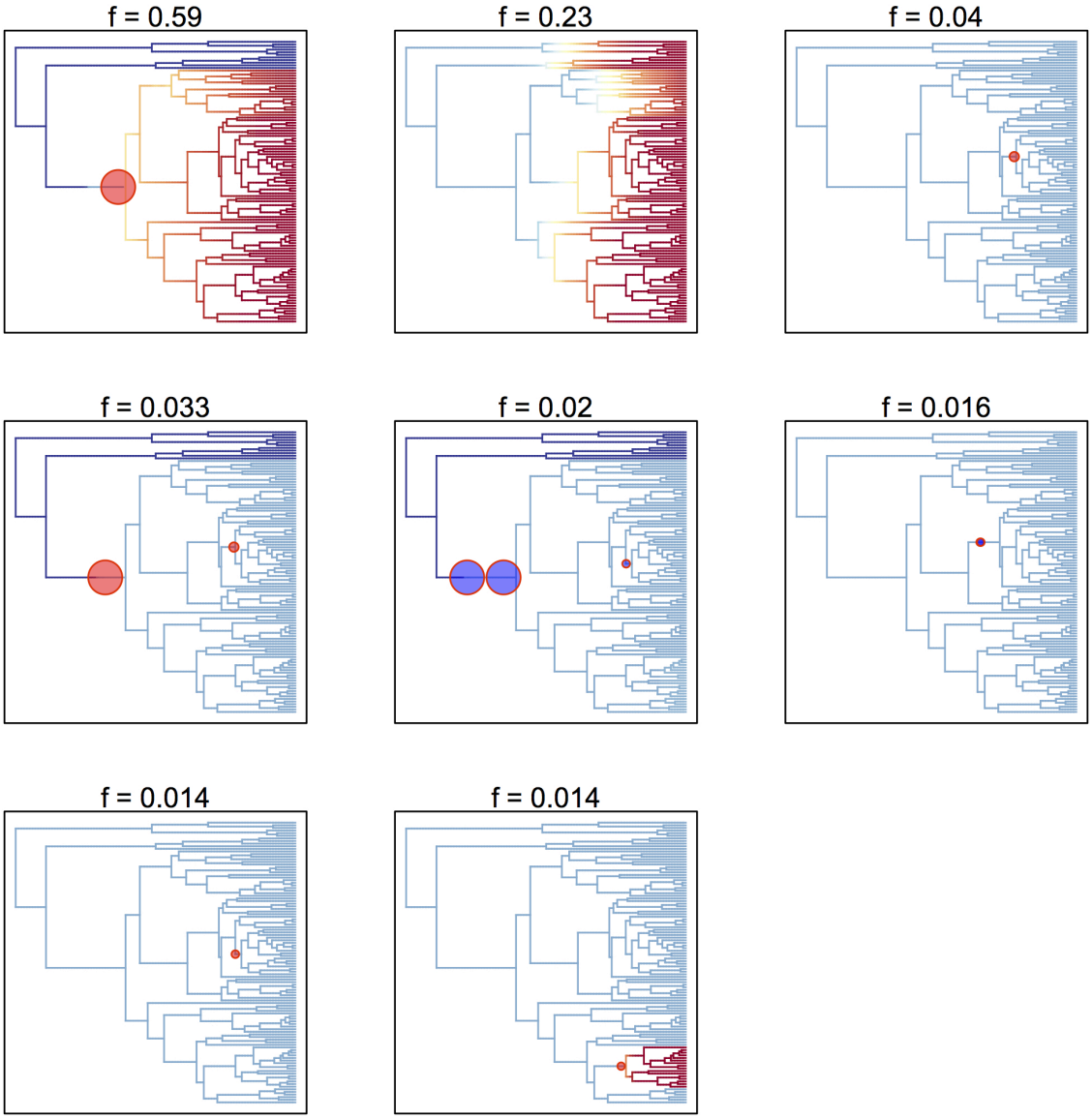



**Fig. S3**. Set of the most frequently sampled distinct shift configurations with the highest posterior probability. For each distinct shift configuration, the locations of rate shifts are shown as red (rate increases) and blue (rate decreases) circles, with circle size proportional to the marginal probability of the shift. Text labels (e.g., *f* = 0.59) denote the posterior probability of each shift configuration.

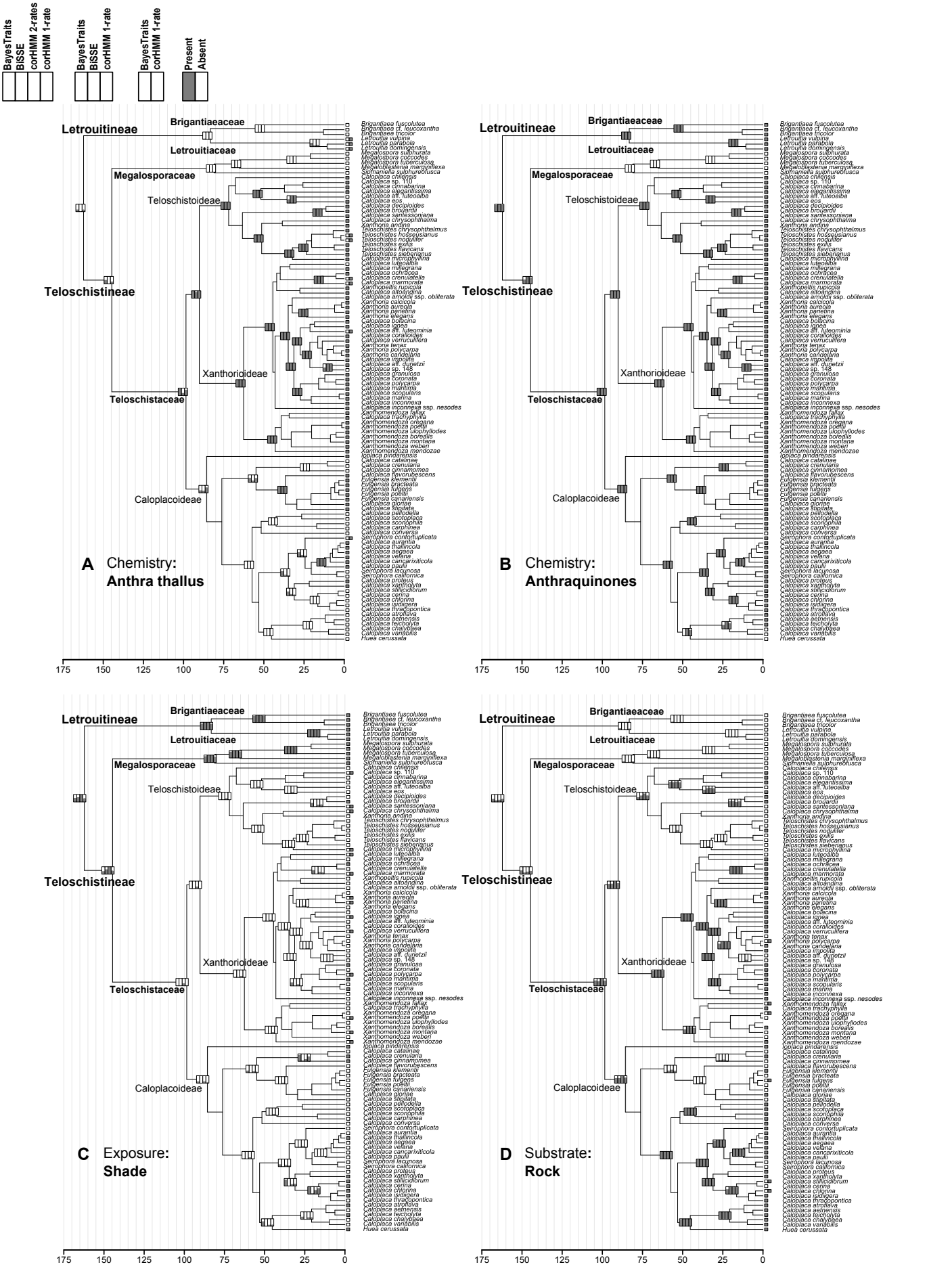
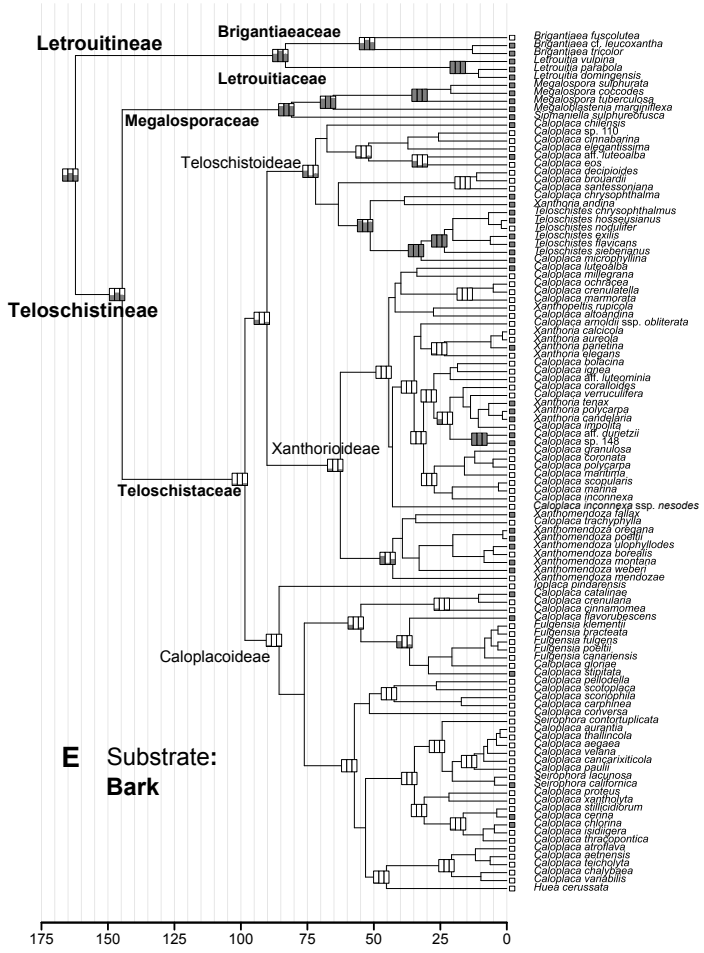
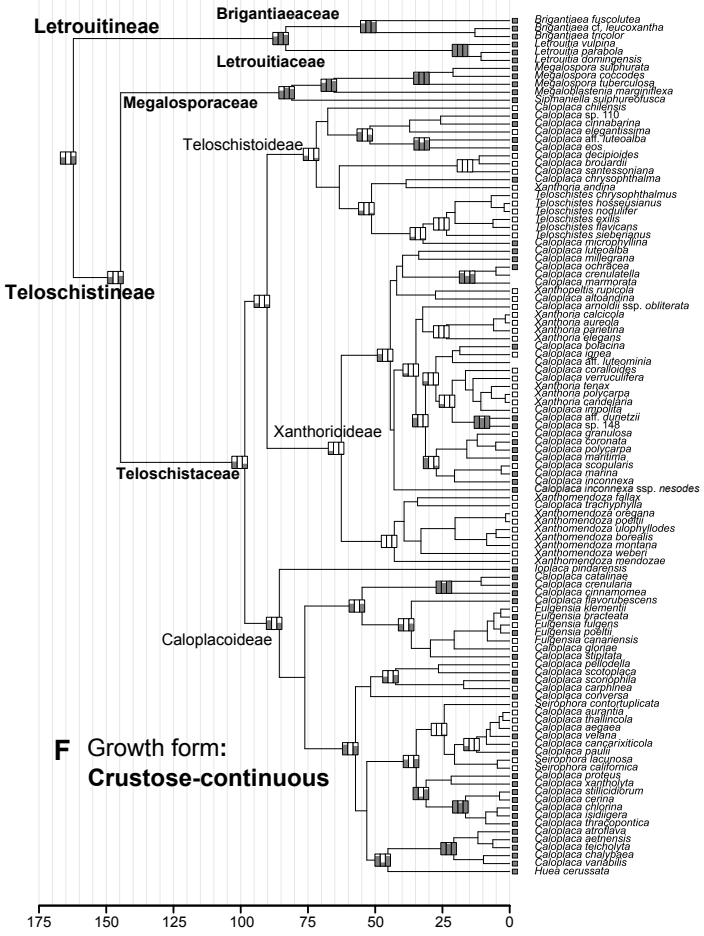



**Fig. S4.** (See next page for caption).



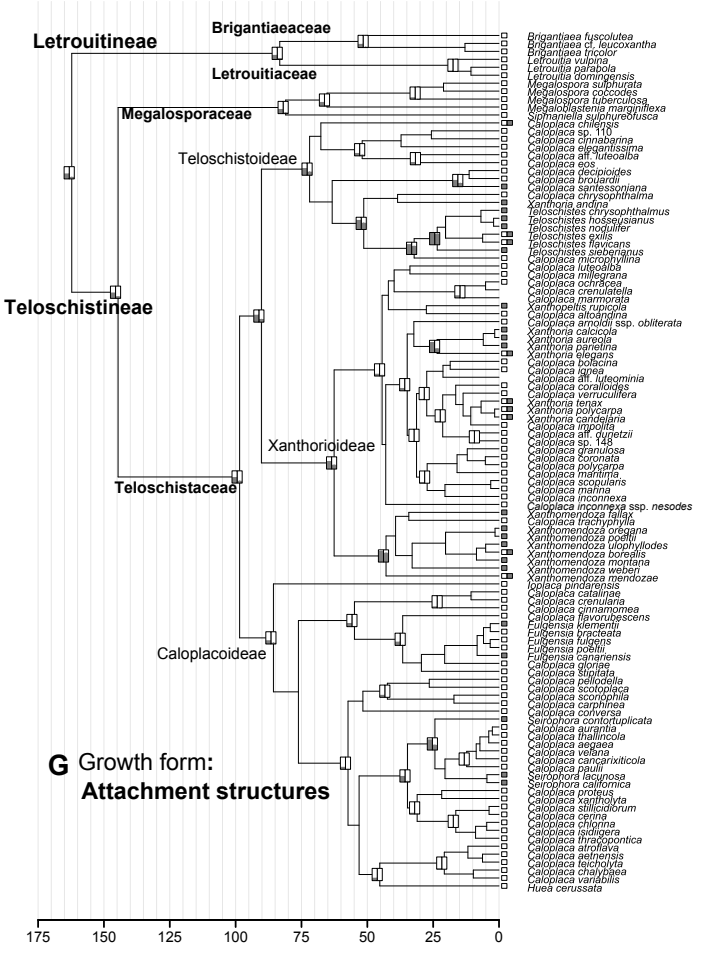




**Fig. S4.** Ancestral character state estimations for selected binary characters A) presence of anthraquinones in the thallus, B) presence of anthraquinones, C) shade exposure, D) rock substrate, E) bark substrate, F) crustose-continuous growth habit, G) attachment structures, using four different methods: (1) BayesTraits (accounting for model parameter and phylogenetic uncertainty); (2) BiSSE [Binary State Speciation and Extinction; accounting for effects of trait evolution on species diversification among lineages; (16)], assuming that our phylogeny represents a random sample of extant species (20); (3) hidden rates model (HRM) implemented in R package *corHMM* (accounting for different rates of evolution in a binary character along different branches of a phylogeny, (18)); (4) standard maximum likelihood (ML) estimation. Boxes on internodes show the estimated probabilities of the trait being present (black) or absent (white). In figures with four boxes per internode, these represent (from left to right): BayesTraits, BiSSE, *corHMM* (2-rates) and *corHMM* (1-rate; equivalent to a standard ML ancestral state estimation) analyses. In figures with three boxes, *corHMM* (2-rates) is omitted due to lack of evidence for more than one evolutionary rate. In figures with two boxes, *corHMM* (2-rates) as well as BiSSE analyses are omitted due to lack of evidence for trait correlation with diversification rates in the latter analysis.

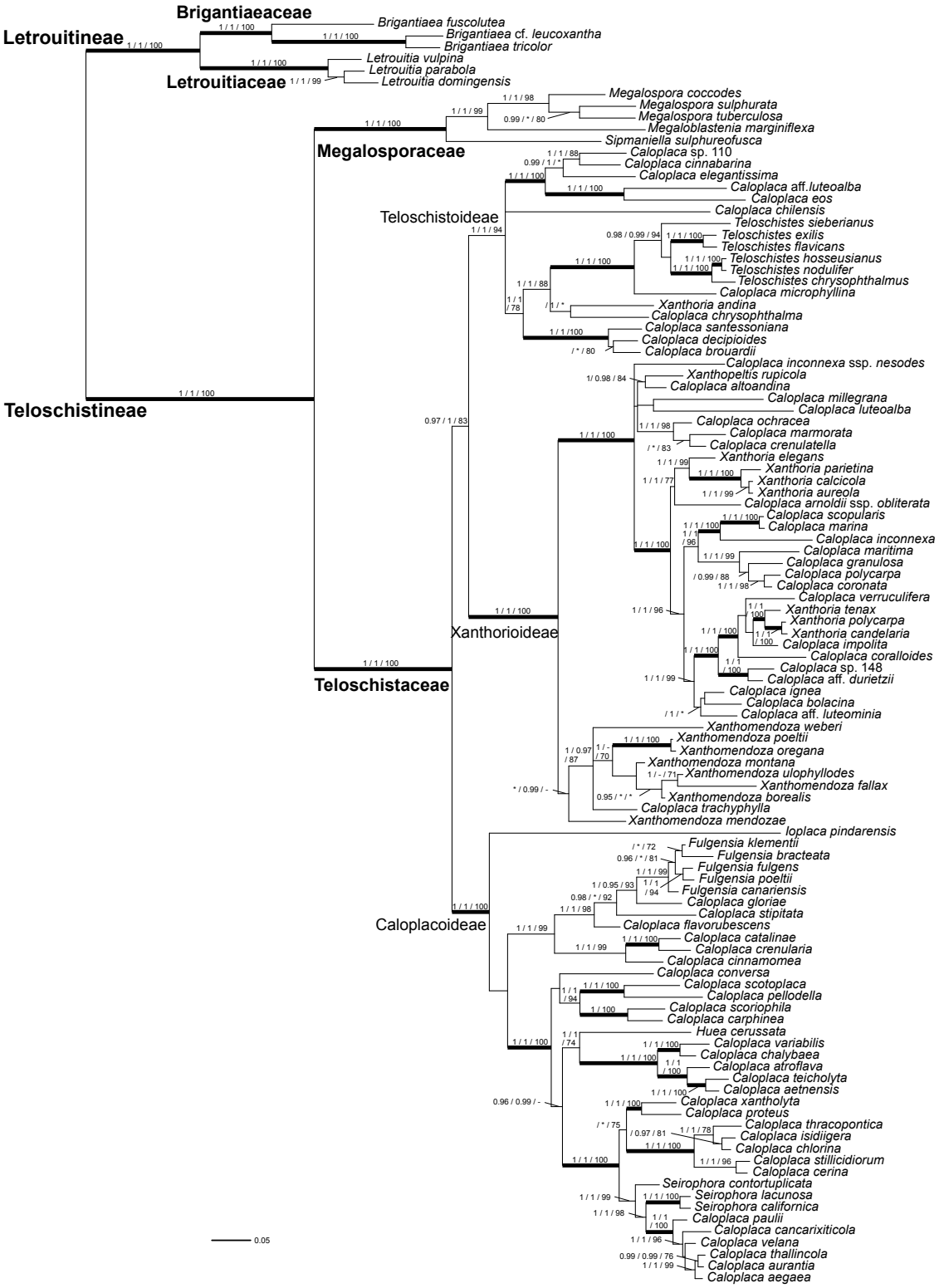



**Fig. S5.** Teloschistales phylogeny. Topology derived from Bayesian analysis performed on a combined 5.8S, nrLSU, mtSSU, *RPB*1 and *RPB*2 (two loci) supermatrix for 108 taxa. Only taxa with at least three genes were included. The suborder Letrouitineae was used to root the tree. The three support values associated with branches are Bayesian posterior probabilities from MrBayes / from BEAST / maximum likelihood bootstrap values from RAxML. Only bootstrap values ≥70% or posterior probabilities ≥0.95 are indicated. Thickened branches denote posterior probabilities = 1.00 and bootstrap support values = 100.

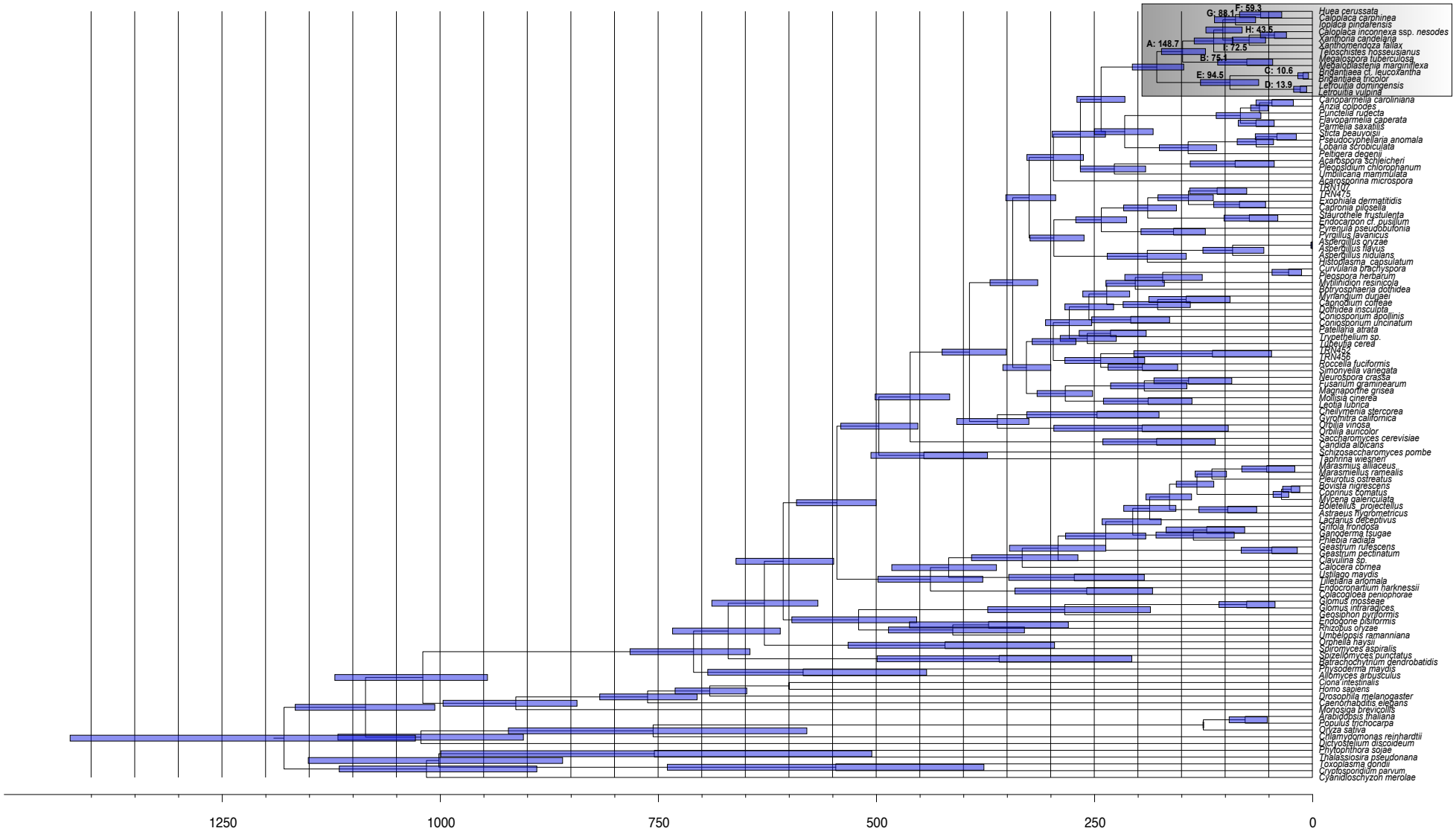



**Fig. S6.** Chronogram picturing divergence time estimates for 114 taxa representing all main groups of fungi and other eukaryotes (eukaryotes dataset) obtained using a five-gene dataset (*RPB*1, *RPB*2, *EF*1a, nrLSU, and nrSSU). Bars correspond to 95% confidence intervals. The Teloschistales clade is highlighted by a grey box.

**Table S1.** Summary of likelihood-ratio tests and ΔAICs of two alternative BiSSE models (full model versus λ0=λ1, μ0=μ1) considering different taxon sampling scenarios, with P-values based on a $\chi^2$ distribution (16). Parameters were estimated using a single ML tree. (*** p<0.001, ** p<0.01, * p<0.05).

| **BiSSE** | | | |
|---|---|---|---|
| **Anthra Thallus** | **ΔlnL** | **ΔAIC** | **P value** |
| Complete sampling | 2.45 | 0.9 | 0.08678 |
| 90% Taxa sampled | 2.66 | 1.4 | 0.07005 |
| 80% Taxa sampled | 2.89 | 1.8 | 0.05564 |
| 70% Taxa sampled | 3.07 | 2.2 | **0.0463 *** |
| 60% Taxa sampled | 3.17 | 2.4 | **0.04173 *** |
| 50% Taxa sampled | 3.18 | 2.4 | **0.0414 *** |
| 40% Taxa sampled | 3.18 | 2.4 | **0.04139 *** |
| 30% Taxa sampled | 3.18 | 2.4 | **0.04139 *** |
| 20% Taxa sampled | 3.18 | 2.4 | **0.04139 *** |
| 10% Taxa sampled | 3.18 | 2.4 | **0.0414 *** |
| **Anthraquinones** | **ΔlnL** | **ΔAIC** | **P value** |
| Complete sampling | 3.18 | 2.37 | **0.04153 *** |
| 90% Taxa sampled | 3.81 | 3.62 | **0.02219 *** |
| 80% Taxa sampled | 4.06 | 4.11 | **0.01726 *** |
| 70% Taxa sampled | 3.44 | 2.88 | **0.03214 *** |
| 60% Taxa sampled | 3.48 | 2.95 | **0.0309 *** |
| 50% Taxa sampled | 3.49 | 2.98 | **0.03047 *** |
| 40% Taxa sampled | 3.49 | 2.98 | **0.03048 *** |
| 30% Taxa sampled | 3.49 | 2.97 | **0.03057 *** |
| 20% Taxa sampled | 3.49 | 2.99 | **0.03042 *** |
| 10% Taxa sampled | 2.83 | 1.65 | 0.05899 |
| **Shade** | **ΔlnL** | **ΔAIC** | **P value** |
| Complete sampling | 5.56 | 7.1 | **0.003869 **** |
| 90% Taxa sampled | 5.95 | 7.9 | **0.002602 **** |
| 80% Taxa sampled | 6.21 | 8.4 | **0.002007 **** |
| 70% Taxa sampled | 6.62 | 9.2 | **0.001334 **** |
| 60% Taxa sampled | 6.99 | 9.9 | **0.0009263 ***** |
| 50% Taxa sampled | 7.25 | 10.5 | **0.0007091 ***** |
| 40% Taxa sampled | 7.33 | 10.6 | **0.0006568 ***** |
| 30% Taxa sampled | 7.33 | 10.6 | **0.0006594 ***** |
| 20% Taxa sampled | 7.33 | 10.6 | **0.0006567 ***** |
| 10% Taxa sampled | 7.33 | 10.6 | **0.0006569 ***** |
| **Rock** | **ΔlnL** | **ΔAIC** | **P value** |
| Complete sampling | 2.01 | 0.1 | 0.1338 |
| 90% Taxa sampled | 2.13 | 0.3 | 0.1177 |
| 80% Taxa sampled | 2.27 | 0.5 | 0.1032 |
| 70% Taxa sampled | 2.36 | 0.7 | 0.0947 |
| 60% Taxa sampled | 2.37 | 0.8 | 0.09291 |
| 50% Taxa sampled | 2.37 | 0.8 | 0.0929 |
| 40% Taxa sampled | 2.38 | 0.8 | 0.09289 |
| 30% Taxa sampled | 2.37 | 0.8 | 0.09289 |
| 20% Taxa sampled | 2.37 | 0.8 | 0.09295 |
| 10% Taxa sampled | 2.38 | 0.8 | 0.09528 |
| **Bark** | **ΔlnL** | **ΔAIC** | **P value** |
| Complete sampling | 2.38 | 0.7 | 0.09173 |
| 90% Taxa sampled | 2.57 | 1.2 | 0.07593 |
| 80% Taxa sampled | 2.78 | 1.6 | 0.06203 |
| 70% Taxa sampled | 2.94 | 1.9 | 0.05295 |
| 60% Taxa sampled | 3.02 | 2.1 | **0.04885 *** |
| 50% Taxa sampled | 3.02 | 2.1 | **0.04876 *** |
| 40% Taxa sampled | 3.02 | 2.1 | **0.04875 *** |

**Table S1.** (Continued)

| **Bark** | **ΔlnL** | **ΔAIC** | **P value** |
|---|---|---|---|
| 30% Taxa sampled | 3.02 | 2.1 | **0.04874 *** |
| 20% Taxa sampled | 3.02 | 2.1 | **0.04877 *** |
| 10% Taxa sampled | 3 | 2 | **0.04987 *** |
| **Crustose-continuous** | **ΔlnL** | **ΔAIC** | **P value** |
| Complete sampling | 8.06 | 12.1 | **0.0003149 ***** |
| 90% Taxa sampled | 8.22 | 12.4 | **0.0002698 ***** |
| 80% Taxa sampled | 8.38 | 12.7 | **0.0002282 ***** |
| 70% Taxa sampled | 8.5 | 13 | **0.0002032 ***** |
| 60% Taxa sampled | 8.55 | 13.1 | **0.000194 ***** |
| 50% Taxa sampled | 8.55 | 13.1 | **0.0001941 ***** |
| 40% Taxa sampled | 8.55 | 13.1 | **0.0001942 ***** |
| 30% Taxa sampled | 8.54 | 13.1 | **0.0001943 ***** |
| 20% Taxa sampled | 8.54 | 13.1 | **0.0001947 ***** |
| 10% Taxa sampled | 8.54 | 13.1 | **0.000194 ***** |
| **Attach. Struct.** | **ΔlnL** | **ΔAIC** | **P value** |
| Complete sampling | 0.67 | -2.6 | 0.5123 |
| 90% Taxa sampled | 0.83 | -2.3 | 0.4391 |
| 80% Taxa sampled | 0.99 | -2 | 0.3728 |
| 70% Taxa sampled | 1.09 | -1.8 | 0.3381 |
| 60% Taxa sampled | 1.1 | -1.8 | 0.3344 |
| 50% Taxa sampled | 0.89 | -2.2 | 0.4117 |
| 40% Taxa sampled | 1.1 | -1.8 | 0.3343 |
| 30% Taxa sampled | 1.1 | -1.8 | 0.3342 |
| 20% Taxa sampled | 1.1 | -1.8 | 0.3348 |
| 10% Taxa sampled | 1.1 | -1.8 | 0.3343 |

**Table S2**. Summary of likelihood-ratio tests and ΔAICs of alternative BiSSEness models (21) considering different taxon sampling scenarios. Parameters were estimated using a single ML tree. (*** p<0.001, ** p<0.01, * p<0.05). The cases where a cladogenetic effect was significant are highlighted in red.

**BiSSEness**

| **Anthra Thallus** | **ΔlnL** | **ΔAIC** | **P value** |
|---|---|---|---|
| **Complete sampling:** | | | |
| Full model vs. p0c=p1c | 0.66 | -0.7 | 0.2492 |
| Full model vs. p1c=0 (p0c=p1c) | 1.19 | -1.6 | 0.3038 |
| Full model vs. λ0=λ1, μ0=μ1 | 1.35 | -1.3 | 0.2581 |
| p0c=p1c vs. p1c=0 | 0.53 | -0.9 | 0.3044 |
| p1c=0 vs. λ0=λ1, μ0=μ1 | 2.45 | 0.9 | 0.08684 |
| full model vs. λ0=λ1, μ0=μ1 (p1c=0) | 3.64 | -0.7 | 0.1223 |
| **50% Taxa sampled:** | | | |
| Full model vs. p0c=p1c | 0.29 | -1.4 | 0.4456 |
| Full model vs. p1c=0 (p0c=p1c) | 0.87 | -2.3 | 0.4201 |
| Full model vs. λ0=λ1, μ0=μ1 | 2.5 | 1 | 0.08203 |
| p0c=p1c vs. p1c=0 | 0.58 | -0.9 | 0.283 |
| p1c=0 vs. λ0=λ1, μ0=μ1 (p1c=0) | **3.18** | **2.4** | **0.04142 *** |
| Full model vs. λ0=λ1, μ0=μ1 (p1c=0) | 4.05 | 0.1 | 0.08789 |
| **10% Taxa sampled:** | | | |
| Full model vs. p0c=p1c | 0.04 | -1.9 | 0.7797 |
| Full model vs. p1c=0 (p0c=p1c) | 0.21 | -3.6 | 0.813 |
| Full model vs. λ0=λ1, μ0=μ1 | **3.09** | **2.2** | **0.04557 *** |
| p0c=p1c vs. p1c=0 | 0.17 | -1.7 | 0.5622 |
| p1c=0 vs. λ0=λ1, μ0=μ1 (p1c=0) | **3.18** | **2.4** | **0.04141 *** |
| full model vs. λ0=λ1, μ0=μ1 (p1c=0) | 3.39 | -1.2 | 0.1478 |
| **Shade** | **ΔlnL** | **ΔAIC** | **P value** |
| **Complete sampling:** | | | |
| Full model vs. p0c=p1c | 0.03 | -1.9 | 0.8072 |
| Full model vs. p1c=0 (p0c=p1c) | **5.52** | **7.1** | **0.004013 **** |
| Full model vs. λ0=λ1, μ0=μ1 | 2.74 | 1.5 | 0.06493 |
| p0c=p1c vs. p1c=0 | **5.49** | **9** | **0.0009227 ***** |
| p1c=0 vs. λ0=λ1, μ0=μ1 (p1c=0) | **5.56** | **7.1** | **0.003856 **** |
| full model vs. λ0=λ1, μ0=μ1 (p1c=0) | **11.08** | **14.2** | **0.0001869 ***** |
| **50% Taxa sampled:** | | | |
| Full model vs. p0c=p1c | 0.93 | -0.1 | 0.1729 |
| Full model vs. p1c=0 (p0c=p1c) | **5.26** | **6.5** | **0.005236 **** |
| Full model vs. λ0=λ1, μ0=μ1 | **6.89** | **9.8** | **0.00102 **** |
| p0c=p1c vs. p1c=0 | **4.33** | **6.6** | **0.003276 **** |
| p1c=0 vs. λ0=λ1, μ0=μ1 | **7.19** | **10.4** | **0.0007517 ***** |
| full model vs. λ0=λ1, μ0=μ1 (p1c=0) | **12.45** | **16.9** | **5.292e-05 ***** |
| **10% Taxa sampled:** | | | |
| Full model vs. p0c=p1c | 0.98 | 0 | 0.1605 |
| Full model vs. p1c=0 (p0c=p1c) | 1.63 | -0.7 | 0.1952 |
| Full model vs. λ0=λ1, μ0=μ1 | **7.8** | **11.6** | **0.0004076 ***** |
| p0c=p1c vs. p1c=0 | 0.65 | -0.7 | 0.2545 |
| p1c=0 vs. λ0=λ1, μ0=μ1 (p1c=0) | **7.33** | **10.6** | **0.0006568 ***** |
| full model vs. λ0=λ1, μ0=μ1 (p1c=0) | **8.96** | **9.9** | **0.001277 **** |
| **Rock** | **ΔlnL** | **ΔAIC** | **P value** |
| **Complete sampling:** | | | |
| Full model vs. p0c=p1c | 0.95 | -0.1 | 0.1678 |
| Full model vs. p1c=0 (p0c=p1c) | **5.97** | **7.9** | **0.002575 **** |
| Full model vs. λ0=λ1, μ0=μ1 | 2.04 | 0.1 | 0.13 |
| p0c=p1c vs. p1c=0 | **5.02** | **8** | **0.001548 **** |
| p1c=0 vs. λ0=λ1, μ0=μ1 (p1c=0) | 2.01 | 0.1 | 0.1338 |
| full model vs. λ0=λ1, μ0=μ1 (p1c=0) | **7.98** | **8** | **0.003092 **** |

**Table S2**. (Continued).

| Rock | ΔlnL | ΔAIC | P value |
|---|---|---|---|
| **50% Taxa sampled:** | | | |
| Full model vs. p0c=p1c | 0.44 | -1.1 | 0.3481 |
| Full model vs. p1c=0 (p0c=p1c) | **5.09** | **6.1** | **0.006191 **** |
| Full model vs. λ0=λ1, μ0=μ1 | **3.26** | **2.5** | **0.03868 *** |
| p0c=p1c vs. p1c=0 | **4.65** | **7.2** | **0.002305 **** |
| p1c=0 vs. λ0=λ1, μ0=μ1 | 2.37 | 0.8 | 0.09289 |
| full model vs. λ0=λ1, μ0=μ1 (p1c=0) | **7.46** | **6.9** | **0.004866 **** |
| **10% Taxa sampled:** | | | |
| Full model vs. p0c=p1c | 0.06 | -1.9 | 0.7355 |
| Full model vs. p1c=0 (p0c=p1c) | 1.53 | -1 | 0.2165 |
| Full model vs. λ0=λ1, μ0=μ1 | 2.72 | 1.4 | 0.06545 |
| p0c=p1c vs. p1c=0 | 1.47 | 0.9 | 0.08606 |
| p1c=0 vs. λ0=λ1, μ0=μ1 (p1c=0) | 2.38 | 0.8 | 0.09287 |
| full model vs. λ0=λ1, μ0=μ1 (p1c=0) | 3.91 | -0.2 | 0.09865 |
| **Bark** | **ΔlnL** | **ΔAIC** | **P value** |
| **Complete sampling:** | | | |
| Full model vs. p0c=p1c | 0.12 | -1.7 | 0.6255 |
| Full model vs. p1c=0 (p0c=p1c) | **4.68** | **5.4** | **0.009305 **** |
| Full model vs. λ0=λ1, μ0=μ1 | **3.2** | **2.4** | **0.04086 *** |
| p0c=p1c vs. p1c=0 | **4.56** | **7.1** | **0.002534 **** |
| p1c=0 vs. λ0=λ1, μ0=μ1 (p1c=0) | 2.38 | 0.7 | 0.09169 |
| full model vs. λ0=λ1, μ0=μ1 (p1c=0) | **7.06** | **6.1** | **0.006882 **** |
| **50% Taxa sampled:** | | | |
| Full model vs. p0c=p1c | 0.29 | -1.4 | 0.4406 |
| Full model vs. p1c=0 (p0c=p1c) | **4.35** | **4.7** | **0.01283 *** |
| Full model vs. λ0=λ1, μ0=μ1 | **3.89** | **3.8** | **0.02044 *** |
| p0c=p1c vs. p1c=0 | **4.06** | **6.1** | **0.004384 **** |
| p1c=0 vs. λ0=λ1, μ0=μ1 | **3.02** | **2.1** | **0.04869 *** |
| full model vs. λ0=λ1, μ0=μ1 (p1c=0) | **7.37** | **6.8** | **0.005233 **** |
| **10% Taxa sampled:** | | | |
| Full model vs. p0c=p1c | 0.14 | -1.7 | 0.5948 |
| Full model vs. p1c=0 (p0c=p1c) | 1.66 | -0.7 | 0.1905 |
| Full model vs. λ0=λ1, μ0=μ1 | **3.41** | **2.8** | **0.03312 *** |
| p0c=p1c vs. p1c=0 | 1.52 | 1 | 0.08158 |
| p1c=0 vs. λ0=λ1, μ0=μ1 (p1c=0) | **3.02** | **2.1** | **0.04873 *** |
| full model vs. λ0=λ1, μ0=μ1 (p1c=0) | 4.68 | 1.4 | 0.05273 |
| **Crustose-continuous** | **ΔlnL** | **ΔAIC** | **P value** |
| **Complete sampling:** | | | |
| Full model vs. p0c=p1c | 0.96 | -0.1 | 0.1645 |
| Full model vs. p1c=0 (p0c=p1c) | 0.96 | -2.1 | 0.3818 |
| Full model vs. λ0=λ1, μ0=μ1 | **6.02** | **8** | **0.002411 **** |
| p0c=p1c vs. p1c=0 | 0 | -2 | -0.0070079 |
| p1c=0 vs. λ0=λ1, μ0=μ1 (p1c=0) | **8.06** | **12.1** | **0.0003149 ***** |
| full model vs. λ0=λ1, μ0=μ1 (p1c=0) | **9.02** | **10** | **0.001206 **** |
| **50% Taxa sampled:** | | | |
| Full model vs. p0c=p1c | 0.6 | -0.8 | 0.2717 |
| Full model vs. p1c=0 (p0c=p1c) | 0.6 | -2.8 | 0.5463 |
| Full model vs. λ0=λ1, μ0=μ1 | **7.39** | **10.8** | **0.0006186 ***** |
| p0c=p1c vs. p1c=0 | 0 | -2 | 0.9733 |
| p1c=0 vs. λ0=λ1, μ0=μ1 | **8.55** | **13.1** | **0.0001942 ***** |
| full model vs. λ0=λ1, μ0=μ1 (p1c=0) | **9.15** | **10.3** | **0.001077 **** |
| **10% Taxa sampled:** | | | |
| Full model vs. p0c=p1c | 0.41 | -1.1 | 0.3655 |
| Full model vs. p1c=0 (p0c=p1c) | 0.39 | -3.2 | 0.6735 |

**Table S2**. (Continued).

| **Crustose-continuous** | **ΔlnL** | **ΔAIC** | **P value** |
|---|---|---|---|
| Full model vs. λ0=λ1, μ0=μ1 | **8.52** | **13.1** | **0.0001995 ***** |
| p0c=p1c vs. p1c=0 | -0.02 | -2.1 | -0.028563 |
| p1c=0 vs. λ0=λ1, μ0=μ1 (p1c=0) | **8.55** | **13.1** | **0.000194 ***** |
| full model vs. λ0=λ1, μ0=μ1 (p1c=0) | **8.94** | **9.9** | **0.001299 **** |
| **Attach. Struct.** | **ΔlnL** | **ΔAIC** | **P value** |
| **Complete sampling:** | | | |
| Full model vs. p0c=p1c | 0.91 | -0.2 | 0.1763 |
| Full model vs. p1c=0 (p0c=p1c) | 2.92 | 1.8 | 0.05394 |
| Full model vs. λ0=λ1, μ0=μ1 | 2.18 | 0.3 | 0.1133 |
| p0c=p1c vs. p1c=0 | 2.01 | 2 | 0.0452 * |
| p1c=0 vs. λ0=λ1, μ0=μ1 (p1c=0) | 0.67 | 2.6 | 0.5122 |
| full model vs. λ0=λ1, μ0=μ1 (p1c=0) | 3.59 | -0.8 | 0.1268 |
| **50% Taxa sampled:** | | | |
| Full model vs. p0c=p1c | 1.36 | 0.7 | 0.09856 |
| Full model vs. p1c=0 (p0c=p1c) | 2.44 | 0.9 | 0.0867 |
| Full model vs. λ0=λ1, μ0=μ1 | 2.55 | 1.1 | 0.07797 |
| p0c=p1c vs. p1c=0 | 1.08 | 0.2 | 0.1415 |
| p1c=0 vs. λ0=λ1, μ0=μ1 | 1.1 | -1.8 | 0.335 |
| full model vs. λ0=λ1, μ0=μ1 (p1c=0) | 3.54 | 0.1 | 0.1318 |
| **10% Taxa sampled:** | | | |
| Full model vs. p0c=p1c | 0.06 | -1.9 | 0.728 |
| Full model vs. p1c=0 (p0c=p1c) | 0.42 | -3.2 | 0.6565 |
| Full model vs. λ0=λ1, μ0=μ1 | 1.07 | -1.9 | 0.3436 |
| p0c=p1c vs. p1c=0 | 0.36 | -1.3 | 0.3959 |
| p1c=0 vs. λ0=λ1, μ0=μ1 (p1c=0) | 0.94 | -2.1 | 0.3941 |
| full model vs. λ0=λ1, μ0=μ1 (p1c=0) | 1.36 | -5.3 | 0.6085 |

**Table S3**. Voucher information for taxa included in this study organized according to the classification by (2). GenBank ID numbers are provided for sequences retrieved directly from GenBank, whereas GenBank accession numbers are provided for new sequences obtained in this study (indicated in bold). Sequences of *RPB*2 are divided into two amplicons (5–7, 7–11). Asterisks indicate amplicons of *RPB*2 newly sequenced in this study. In the Source column GB refers to GenBank as a source of sequences, and AFToL followed by numbers refer to the AFToL database.

| Classification | Taxon | Source | Locality/ Voucher | ITS | mtSSU | nrLSU | *RPB*1[A-D] | *RPB*2[5-7] | *RPB*2[7-11] |
|---|---|---|---|---|---|---|---|---|---|
| **Letrouitineae** | | | | | | | | | |
| **Brigantiaeaceae** | *Brigantiaea* cf. *leucoxantha* | GB/This study | Mascarene Islands, La Réunion, SW of St-André, N edge of Forêt Domaniale de la Plaine des Lianes, E-W trail, S of Cascade du Chien to Abri, boulders and outcrops in stream 'Bras des Lianes', tropical forest, 55º36.7'E 21º01.7'S, 730 m elev., on Guave, 5.6.2008, leg. P. & B. v.d. Boom 40691, D. & M. Brand, E. Sérusiaux (P.v.d. Boom Herb.). | 394998679 | 394998502 | 394998567 | 394998728 | **KT291611** | — |
| | *Brigantiaea fuscolutea* | GB | USA, Alaska, N of Skagway, White Pass, alpine, 59º36.833'N, 135º09.003'W, 948 m elev., over rocks on detritus in dry snow bed, 1.8.2008, leg. T. Spribille 26961 (GZU). | — | 394998503 | 394998569 | 394998732 | — | 394998802 |
| | *Brigantiaea tricolor* | GB/This study | Mascarene Islands, La Réunion, NW of Plaine-des-Palmistes, NW side of Forêt de Bébour, trail GR R1 from Gite de Bélouve, c. 3.5km to the south-west, to Caverne Mussard, 1980 m elev., well-lit area with mixed shrubs, including *Philippia* sp., on *Phylia* sp., 2.6.2008, leg. P. & B. v.d. Boom 40492, D. & M. Brand & E. Sérusiaux (P.v.d. Boom Herb.). | 394998680 | — | 394998568 | 394998730 | 394998800* | 394998800 |
| **Letrouitiaceae** | *Letrouitia domingensis* | GB | Dominican Republic, Duarte prov., NE of San Francisco de Macoris, Reserva Científica, SSE slope of Loma Quita Espuela, starting point at 'Rancho Don Lulu', trail in cocoa plantation with mature trees, 70º08.80'W 19º20.43'N, 400 m elev., on coffee shrub, 4.2.2008, leg. P. & B. v.d. Boom 39385 (P.v.d. Boom Herb.). | 394998698 | 394998530 | 394998594 | 394998760 | 394998850 | 394998850 |
| | *Letrouitia parabola* | GB | Alabama, Escambia Co., Andalusia Area, Solon-Dixon Forestry Center, montane rainforest, on *Fagus americana*, 14.4.2007, leg. E. Gaya 11 (DUKE). | 394998700 | 394998532 | 394998595 | 394998762 | — | 394998852 |
| | *Letrouitia vulpina* | GB | Mascarene Islands, La Réunion, Cirque de Cilaos, N of Cilaos, Forêt du Grand Matarum, trail GR R1, to Caverne Dufour, tropical rainforest, first part, from parking lot along road to Bras sec, up to 200 m in the forest, 55º29.2'E 21º07.3'S, 1420 m elev., on strong sloping trunk, 31.5.2008, leg. P. & B. v.d. Boom 40279, D. & M. Brand & E. Sérusiaux (P.v.d. Boom Herb.). | 394998702 | 394998534 | 394998596 | 394998764 | — | 394998854 |
| **Teloschistineae** | | | | | | | | | |
| **Megalosporaceae** | *Megaloblastenia margininiflexa* | GB/This study | Mascarene Islands, La Réunion, NW of Plaine-des-Palmistes, N side of Forêt de Bébour, Forêt de Bélouve (W), near Gite de Bélouve, 55º32.50'E 21º03.50'S, 1520 m elev., area with mature *Acacia heterophylla* trees in mixed forest along road and path, on small tree, 27.5.2008, leg. P. & B. v.d. Boom 39805, D. & M. Brand & E. Sérusiaux (P.v.d. Boom Herb.). | 394998703 | 394998535 | 394998597 | 394998766 | 394998856* | 394998856 |
| | *Megalospora coccodes* | This study | Mascarene Islands, La Réunion, Cirque de Cilaos, N of Cilaos, Forêt du Grand Matarum, trail GR R1, to Caverne Dufour, tropical rainforest, first part, from parking lot along road to Bras sec, up to 200 m in the forest, 55º29.2'E 21º07.3'S, 1420 m, on unidentified tree, 8 cm diam, 31.5.2008, leg. P. & B. v.d. Boom 40221, D. & M. Brand & E. Sérusiaux (P.v.d. Boom Herb.). | **KT291469** | **KT291520** | **KT291563** | — | — | — |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | *Megalospora sulphurata* | GB | Mascarene Islands, La Réunion, NW of Plaine-des-Palmistes, Forêt de Bébour, trail in tropical rainforest, from main road, just N of Col de Bébour, to Cassé de Takamaka, 1340 m elev., on Dombeya, 1.6.2008, leg. P. v.d. Boom 40349, M. Brand & E. Sérusiaux (P.v.d. Boom Herb.). | 394998706 | 394998539 | 394998598 | — | — | 394998858 |
| | *Megalospora tuberculosa* | GB/AFToL -107 | Costa Rica, Puntarenas, Zona Protectora Las Tablas (AC Amistad Pacifico), Los Portones, 25 km ENE of San Vito, 5 km on gravel road from Progreso to Las Tablas, road side, 82º 48'W 8º55'N, 1600 m elev., 28.6.2002, leg. H. Sipman 47933 (DUKE). | 336397114 | 46411388 | 46411439 | 113707385 | 113957833 | 113957833 |
| | *Sipmaniella sulphureofusca* | GB/This study | Ecuador, Zamora-Chinchipe, Nature Reserve of Estación Científica San Francisco, S of road Loja-Zamora, ca. 40 km from Loja, 79º04'W 3º58'S, 1945 m elev., primary montane forest on steep slope, *Prunus huantensis*, on canopy, 2.7.2004, leg. H. Sipman 53087 (B). | — | 394998529 | 394998593 | — | **KT291659** | — |
| **Teloschistaceae (Caloplacoideae)** | *Caloplaca aegaea* | GB/This study | Spain, Catalonia, Girona prov., Alt Empordà, Llançà, Cau del Llop, wall facing North, slope 10º-30º, 3-5 m, 11.01.2001, leg. E. Gaya 248 & X. Llimona. | 183585217 | — | — | — | **KT291612** | **KT291612** |
| | *Caloplaca aetnensis* | GB/This study | Spain, Catalonia, Girona prov., Alt Empordà, Castell de Quermançó (Vilajuïga), facing South, slope 80º, weathered granite, 23.01.2001, leg. X. Llimona s.n. (BCN). | 183585210 | **KT291476** | — | — | — | **KT291613** |
| | *Caloplaca atroflava* | This study | USA, California, Sta Cruz Island, along road linking the duck and the ranch along river, open oak forest, 34º0.017'N 119º45.097'W, 46 m, shady, 25º slope, very humid, rock immediately bordering a small creek, semi-aquatic, leg. E. Gaya 02.27.10-8a & F. Lutzoni (DUKE). | **KT291444** | **KT291511** | **KT291560** | **KT291593** | **KT291650** | **KT291650** |
| | *Caloplaca aurantia* | GB/This study | Spain, Catalonia, Lleida prov., Segarra, Torà, slopes in the right side of the road to Solsona, Km 13, in front of Sant Miquel de Fontanet church, 41º49'20''N 1º25'10''E, 31TCG6831, 450-550 m, blocks of carbonated sandstone, *Quercus faginea* brushwood, 23.02.1999, leg. P. Navarro-Rosinés & X. Llimona s.n. (BCN 13326). | 183585222 | **KT291479** | — | — | **KT291616** | **KT291616** |
| | *Caloplaca cancarixiticola* | GB/This study | Spain, Castilla-La Mancha, Albacete prov., between Agramón and Cáncarix (Sierra de las Cabras), 30SXH2353, 671 m, on cancarixite, 03.1981, leg. X. Llimona & J.M. Egea s.n. (MUB, holotype). | 183585228 | **KT291482** | — | — | **KT291620** | **KT291620** |
| | *Caloplaca carphinea* | GB/This study | Spain, Catalonia, Girona prov., Alt Empordà, P.N. Cap de Creus, Roses, near Puig del Gall, above Mas de la Torre del Sastre, Jóncols road, 31TEG1777, 200-300 m elev., quartzite blocks, 11.1.2001, leg. E. Gaya 201, X. Llimona & M. De Cáceres (BCN 13714). | 183585215 | | | | **KT291621** | |
| | | GB | Spain, Catalonia, Girona prov., Alt Empordà, P.N. Cap de Creus, Roses, near Puig del Gall, above Mas de la Torre del Sastre, Jóncols road, 31TEG1777, 200-300 m elev., siliceous rocks (quartzite), 4.1.2008, leg. E. Gaya, S. Fernández-Brime 542 & X. Llimona (BCN). | | 394998507 | 394998573 | 394998736 | — | 394998808 |
| | *Caloplaca catalinae* | This study | USA, California, Sta. Cruz Island, South ridge road, 34º00.542'N 119º46.934'W, 405 m, *Quercus pacifica* forest/shrub, very exposed to light, flat, on branches of dead scrub oaks, leg. E. Gaya 02.26.10-13 & F. Lutzoni (DUKE). | **KT291445** | **KT291477** | **KT291532** | **KT291572** | — | **KT291614** |
| | *Caloplaca cerina* | GB | USA, Alaska, Elliott Hway, N65º17.229' W148º11.537', 400 m elev., ca. mile 40, on aspen, 22.7.2007, leg. E. Gaya, J. Geml, J. Gomà (DUKE). | — | 394998508 | 394998574 | — | 394998810 | — |
| | *Caloplaca chalybaea* | GB/This study | Sweden, Gotland, Östergarn par., Österganberget, 57º25'30"N 18º50'24"E, 33 m elev., on calcareous rocks, 14.8.2006, leg. E. Gaya, P. Navarro-Rosinés, U. Arup, U. Sochting, N. Hladun, A. Gómez-Bolea (BCN). | 394998684 | 394998509 | 394998575 | 394998738 | 394998812* | 394998812 |
| | *Caloplaca chlorina* | This study | Sweden, Skåne, Genarp par., Genarp church, at the parking place W of the churchyard. On *Fraxinus* in open, nutrient-enriched situation, RT90: X 6166399 Y 1348136, 09/05/2009, Leg. Ulf Arup L09009 (LD). | **KT291449** | **KT291483** | — | **KT291576** | **KT291622** | — |

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| | *Caloplaca cinnamomea* | GB | Iceland, Sudur-Thingeyjarsysla County, Laxardalur Valley, by Laxa river close to abandoned farm Brettingsstadir, 65°38'24"N, 17°09'48"W, on mosses on soil on big lava extrusion, about 50 m from river, 8.6.2006, leg. F. Lutzoni & C. Gueidan 06.08.07-1 (DUKE). | — | 394998512 | 394998577 | 394998742 | — | 394998818 |
| | *Caloplaca conversa* | This study | Mexico, Baja California South, Loreto, Sierra Giganta, on the road from Loreto to San Javier, next to cinegetic ranch, on plateau, after las parras, 25º57.099'N 111º30.984'W, 514 m, leguminose shrubs and cactus, open-exposed site, North exposure, basaltic boulder along dry creek, leg. E. Gaya 03.03.10-2C & F. Lutzoni (DUKE). | **KT291450** | **KT291504** | **KT291554** | **KT291589** | **KT291643** | **KT291643** |
| | *Caloplaca crenularia* | GB | Sweden, Bohuslän, Kungshamn par., Sunnerskär, 58°19'42.53"N 11°14'48.12"E, 5 elev., granitic islands, 11.8.2006, leg. E. Gaya, P. Navarro-Rosinés, U. Arup, U. Sochting, N. Hladun, A. Gómez-Bolea (BCN). | 394998686 | 394998514 | — | 394998744 | — | 394998822 |
| | *Caloplaca flavorubescens* | GB | We6140; Kasalicky T., Doering H., Rambold G. and Wedin M. (2000). | 13810817 | | 13810817 | — | — | — |
| | | GB | Wedin M., Baloch E. and Grube M. (2002); Wedin M., Doring H., Nordin A. and Tibell L. (2000). | | 33304587 | | — | — | — |
| | *Caloplaca gloriae* | GB | Spain, Almería, E-SE of Almería, Sierra del Cabo de Gata, SW San José, path between Casa Mónsul to Torre de Vela Blanca, small valley (N-S), NE exposed sloping outcrops, 2º10.14'W 36º43.85'N, 75 m elev., volcanic outcrops, 6.9.2007, leg. P. & B. v.d. Boom 38420 (P.v.d. Boom Herb.). | — | — | 394998580 | 394998746 | 394998826 | 394998826 |
| | *Caloplaca isidiigera* | GB/This study | Slovakia, Low Tatras mountains, eastern part of mountains range, mount Velký bok, small limestone outcrops near tourist trail on south slope, 48º56'03.35"N 19º52'53.44"E, 1560 m elev., limestone outcrops, 14.8.2007, leg. J. Šoun (CBFS). | **KT291460** | 394998517 | 394998581 | 394998748 | 394998828* | 394998828 |
| | *Caloplaca paulii* | GB/This study | Spain, Catalonia, Girona prov., Ripollès, Queralbs, Vall de Núria, entre el Torrent de Noucreus i la Coma de les Mulleres, 31TDG3195-3295, 2200-2400 m, decalcified surfaces of calcareous schist, facing North-West, 02.09.2000, leg. E. Gaya 183 (BCN). | 183585226 | **KT291503** | — | — | **KT291642** | **KT291642** |
| | *Caloplaca pellodella* | This study | Mexico, Baja California South, Loreto, Sierra Giganta, on the road from Loreto to San Javier, next to cinegetic ranch, on plateau, after las parras, 25º57.099'N 111º30.984'W, 514 m, leguminose shrubs and cactus, open-exposed site, North exposure, basaltic boulder along dry creek, leg. E. Gaya 03.03.10-2A & F. Lutzoni (DUKE). | — | **KT291505** | **KT291555** | **KT291590** | **KT291644** | **KT291644** |
| | *Caloplaca proteus* | GB/This study | Spain, Catalonia, Tarragona prov., Conca de Barberà, Vimbodí, la Pena (Serra de Prades), 31TCF4181-4281, 700-900 m, walls and small caves of carbonated rocks, NE exposure, 18.01.2001, leg. E. Gaya 215 & X. Llimona (BCN 13706). | 183585233 | **KT291507** | **KT291557** | — | **KT291646** | **KT291646** |
| | *Caloplaca scoriophila* | GB/This study | Spain, Almería, E-SE of Almería, Sierra del Cabo de Gata, path W of Torre de Vela Blanca to lighthouse, small hill, NE exposed sloping outcrops, 2º10.46'W 36º43.82'N, 150 m elev., 6.9.2007, leg. P. & B. v.d. Boom 38386 (P. v.d. Boom Herb.). | 394998689 | 394998521 | 394998585 | 394998750 | 394998832* | 394998832 |
| | *Caloplaca scotoplaca* | GB/This study | Sweden, Bohuslän, Askums par., Vägga, Lökås, near Kugshamn, 58º21'58.36"N 11º17'01.19"E, 22 m elev., siliceous rocks, 11.8.2006, leg. E. Gaya, P. Navarro-Rosinés, U. Arup, U. Sochting, N. Hladun, A. Gómez-Bolea (BCN). | 394998690 | 394998522 | 394998586 | 394998752 | 394998834* | 394998834 |
| | *Caloplaca stillicidiorum* | GB/This study | France, Rhônes-Alpes, Haute-Savoic Platcau des Glières - la Commanderie, palaise au NE de la Mîson de paps 1500 m, 90ºS, calcareous. | 183585227 | **KT291510** | — | — | — | **KT291649** |
| | *Caloplaca stipitata* | This study | Mexico, Baja California South, along road between La Paz and La Constitución, closer to La Paz, 24º03.174'N 110º34.719'W, 268 m, leguminose with cactuses and *Yucca*, sun-exposed, flat slope, on an individual shrub, leg. E. Gaya 03.06.10-5 & F. Lutzoni (DUKE). | **KT291465** | **KT291490** | **KT291543** | **KT291582** | **KT291630** | **KT291630** |

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| | *Caloplaca teicholyta* | GB/This study | Spain, Catalonia, Lleida prov., Segarra, Torà, above Font de Can Porta, road to Solsona, 41º49'05''N 1º25'05''E, 31TCG6830, 550-650 m, sun-exposed blocks of calcareous sandstone, 01.09.2000, leg. E. Gaya 203 & P. Navarro-Rosinés (BCN 13695). | 183585212 | **KT291512** | — | **KT291594** | **KT291651** | **KT291651** |
| | *Caloplaca thallincola* | GB/This study | Sweden, Halland, Varberg, Vendelsö island, 57º17'54.53''N 12º 07'29.68''E, 0-2 m elev., on siliceous rocks, 9.8.2006, leg. E. Gaya, P. Navarro-Rosinés, U. Arup, U. Sochting, N. Hladun, A. Gómez-Bolea (BCN). | 394998692 | 394998523 | 394998588 | **KT291595** | 394998838* | 394998838 |
| | *Caloplaca thracopontica* | GB | Turkey, Black Sea Coast, Sinop, coastal rocks on NE coast of peninsula, 42º01'57.81''N 35º11'34.42''E, 130 m elev., on volcanic rocks, 21.4.2007, leg. J. Šoun (CBFS). | 394998693 | 394998524 | — | — | — | 394998840 |
| | *Caloplaca variabilis* | This study | Italy, Veneto, Verona prov., N-NE of Verona, Monte Purga at Velo Veronese, S-facing grazed slope above the village. On limestone rocks. 45º36.755'N. 11º05.905'E, alt. C. 1230 m. 2007-03-08. Leg. Ulf Arup L07196 (LD). | **KT291466** | **KT291514** | **KT291561** | **KT291597** | **KT291653** | — |
| | *Caloplaca velana* | This study | Italy, Veneto, Verona prov., San Giogio NE of Ambrogio di Valpolicella, SE-facing slope NE of Biotto. On limestone rocks in SE-facing slope with scattered bushes. 45º32.191'N 10º50.548'E, 380 m elev., 2007-03-09. Leg. Ulf Arup L07123 (LD). | **KT291467** | **KT291515** | — | **KT291598** | — | **KT291654** |
| | *Caloplaca xantholyta* | GB/This study | Greece, Crete, Imbros Gorge, 24º09.5'E 35º14'N, 400-700 m elev., on calcareous rock walls, 7.5.2004, leg. T. Spribille 12970 (B). | 394998695 | 394998526 | 394998590 | — | 394998844* | 394998844 |
| | *Fulgensia bracteata* | GB | K141, Kasalicky T., Doering H., Rambold G. and Wedin M. (2000). | 13810787 | | | — | — | — |
| | | GB/AFToL-4844 | Estonia, Saaremaa, Sörve, Kaugatuma alvar, on dry places along road, on soil, 15.6.2004, leg. P. Alanko 121555 (H). | | 394998527 | 394998591 | — | — | — |
| | *Fulgensia canariensis* | GB/This study | Spain, Canary Islands, La Palma, summits of Caldera de Taburiente (Parque Nacional), 2200 m alt., 07.2001, leg. P.L. Pérez de Paz & C. Hernández-Padrón s.n. (TFC Lich: 3593, duplic.). | 183585207 | **KT291516** | **KT291562** | **KT291599** | **KT291655** | **KT291655** |
| | *Fulgensia fulgens* | GB/This study | Sweden, Öland, Hulterstad par., 1.5 km WNW of Gösslunda, N from the road, 56º29'33.84''N 16º30'41.96''E, 33 m elev., calcareous soils and rocks (Ordovician), 12.8.2006, leg. E. Gaya, P. Navarro-Rosinés, U. Arup, U. Sochting, N. Hladun, A. Gómez-Bolea (BCN). | 394998696 | 394998528 | 394998592 | 394998756 | 394998846* | 394998846 |
| | *Fulgensia klementii* | This study | Turkey, Konya province, Geune Valley, Beyreli village, N36º51'220'' E32º21'905'', 1560 m, on calcareous rocks, 28.07.2011, leg. M. Kocakaya and M. G. Halici. | **KT291468** | **KT291517** | — | **KT291600** | **KT291656** | **KT291656** |
| | *Fulgensia poeltii* | GB/This study | Spain, Catalonia, Lleida prov., between Ponts i Torà, after the crossroad de Guissona, Mas d'en Bruc, entre Cal Perxa i Casanova de la Garriga, gypsum-rich walls, South exposure, 27.04.2002, leg. E. Gaya 400 (BCN). | 183585206 | **KT291518** | — | — | **KT291657** | — |
| | *Huea cerussata* | This study | South America. Unknown locality, leg. Ulrik Sochting. | — | **KT291519** | — | **KT291601** | **KT291658** | **KT291658** |
| | *Ioplaca pindarensis* | GB | China, Yunnan prov., Dali co., Mt. Cangshan, 3150-3500 m elev., sclerophyll shrub on steep mountains slopes, on shale, leg. A. Aptroot 56827 (ABL). | 394998697 | — | — | 394998758 | 394998848 | — |
| | *Seirophora californica* | This study | Mexico, Baja California South, along road, between Ciudad Constitution and Puerto San Carlos, N25º02.337' W111º45.814', 41 m, shrubs, with legumes, cactuses, and *Fulqueria*, sun exposed site, flat, humid, on *Fulqueria*, leg. E. Gaya 03.04.10-9 & F. Lutzoni (DUKE). | **KT291470** | **KT291521** | **KT291564** | **KT291602** | **KT291660** | — |
| | *Seirophora contortuplicata* | This study | Tajikistan, 4000m, 14.09.2010, leg. U. Sochting | **KT291471** | **KT291522** | — | **KT291603** | **KT291661** | — |
| | *Seirophora lacunosa* | GB | Spain, Alacant, Les Salines d'Elda, at margins of seasonal lagoon, 30SXH86, 500 m elev., on soil, 28.3.2002, leg. A. Pérez s.n. (BCN, herb. Gaya 391). | 394998708 | 394998542 | 394998600 | 394998770 | 394998864 | 394998864 |

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| **(Teloschistoideae)** | *Caloplaca brouardii* | This study | Mexico, Baja California South, Loreto, Sierra La Giganta, on the road from Loreto to San Javier, next to cinegetic ranch, on plateau, after Las Parras, 25º57.099'N 111º30.984'W, 514 m, shrubs (leguminose) and cactus, sun-exposed, little cliff, facing creek N-NE, exposure North, slope 0-5º flat, substrate locality is volcanic-basaltic, sample collected in different rocks, less vitrified conglomerate, leg. E. Gaya 03.03.10-3 & F. Lutzoni (DUKE). | **KT291448** | — | **KT291536** | **KT291575** | **KT291619** | **KT291619** |
| | *Caloplaca chilensis* | GB | Chile, P.N. Fray Jorge, IVrta Región, 30º39'48"S 71º4'23.7", 455 m elev., on twigs, 5.2008, leg. D. Stanton 0212-0508 (SGO). | 394998685 | 394998510 | 394998576 | 394998740 | — | 394998814 |
| | *Caloplaca chrysophthalma* | This study | Mexico, Sonora, along road 14 to Moctezuma 29º37.009'N 109º56.934'W, 912 m, open forest, partially shaded, top of mountain, epiphytic on bark of the dominant tree, leg. E. Gaya 03.08.10-4 & F. Lutzoni (DUKE). | **KT291446** | **KT291484** | **KT291537** | **KT291577** | **KT291623** | **KT291623** |
| | *Caloplaca cinnabarina* | This study | Mexico, Baja California, along trail between La Burrera and La Laguna, 23º30.973'N 110º02.325'W, 680 m, legume small trees and cactus, 75% sun-exposed site, exposure W, slope 70º, west exposure, humid, on rock boulders along trail, leg. E. Gaya 03.05.10-11 & F. Lutzoni (DUKE). | — | — | **KT291538** | **KT291578** | **KT291624** | **KT291624** |
| | *Caloplaca decipioides* | This study | South Korea, Gangwon Province, Inje-gun, Buk-myun, Yongdae-ri, Sorak-san National Park, inner part of the massif Sorak Mts, along the road in Backdam Valley, from Backdam (Paekdam) temple towards the village Yongdae-ri, where the road crosses the river ca. 1.5 km NW Backdam (Paekdam) temple, 38°10'N 128°22'E, 410–420 m, on almost vertical rock, shaded from running water, probably at least partly with a higher pH than true siliceous rocks, exposed to S at the river, October 2006, Thor 20768 (holotype UPS, isotypes NIBR, UPS). | **KT291453** | **KT291487** | **KT291540** | **KT291579** | **KT291627** | — |
| | *Caloplaca elegantissima* | This study | Namibia, Skeleton coast, 2000, leg. P. Crittenden | **KT291454** | **KT291488** | **KT291541** | **KT291580** | **KT291628** | **KT291628** |
| | *Caloplaca eos* | This study | Australia, New South Wales, S of Anna Bay, Tomaree National Park, 32º47'16"S 152º4'48"E, rock (rhyolite) outcrops along the coast, 24.01.2004, Kärnefelt 20044701, Filson & Kondratyuk 20475 (CANB - holotype, PERTH, AQ, MEL, LD, KW - isotypes). | **KT291455** | **KT291489** | **KT291542** | **KT291581** | — | **KT291629** |
| | *Caloplaca* aff. *luteoalba* | This study | Mexico, Baja California South, along road between La Paz and La Constitución, closer to La Paz, 24º03.174'N 110º34.719'W, 268 m, leguminose with cactuses and *Yucca*, sun-exposed, on a legume tree about 5 m high Leg. E. Gaya 03.06.10-7B & F. Lutzoni (DUKE). | **KT291447** | **KT291497** | **KT291550** | — | — | **KT291636** |
| | *Caloplaca microphyllina* | This study | USA, California, Sta Cruz Island, near main ranch on the road passing to the right of the church when facing the church, 33º59.672'N 119º42.627'W, 58 m, patch of very large *Quercus*, on fallen dead trees, leg. E. Gaya 02.27.10-24 & F. Lutzoni (DUKE). | **KT291462** | **KT291501** | — | — | — | **KT291639** |
| | *Caloplaca santessoniana ad int.* (sub. *Caloplaca* sp. EG-2015a in GB) | This study | Chile, Parque Nacional Pan de Azúcar, coastal hill crust, 25º59'05.7"S 70º36'51.2"W +/- 3 m, 720 m, leg. E. Gaya 19.2.11- 37 & R. Vargas (DUKE). | **KT291463** | **KT291508** | **KT291558** | **KT291592** | **KT291647** | **KT291647** |
| | *Caloplaca* sp. 110 | This study | USA, California, Sta Cruz Island, along the road linking the duck and the ranch, along river, on open slope facing North, 33º59.955'N 119º42.8991'W, 46 m, oak forest, partly shady, slope 25º, volcanic rock, on creek, semi-aquatic, leg. E. Gaya 02.27.10-8B & F. Lutzoni (DUKE). | **KT291456** | **KT291499** | **KT291552** | **KT291587** | **KT291637** | **KT291637** |
| | *Teloschistes chrysophthalmus* | GB | Spain, Catalonia, Tarragona prov., Conca de Barberà, Vimbodí, Barranc de Castellfollit, 550-650 m elev., 31TCF3780-3781, on *Quercus ilex* ssp. *ballota*, 18.1.2001, leg. E. Gaya 200b & X. Llimona (BCN 13687). | 183585272 | 394998543 | 394998601 | 394998772 | 394998866 | 394998866 |
| | *Teloschistes exilis* | GB | USA, Texas, Mason co., Double Helix Ranch, 411 m elev., 30º52'28"N 99º02'53"W, 26.05.07, on bark, D. Hillis 07-726 (DUKE). | 394998709 | 394998544 | 394998602 | 394998774 | 394998868 | 394998868 |

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| | *Teloschistes flavicans* | This study | USA, California, Sta Cruz Island, South Rigde road, 34º00.763'N 119º47.485'W, 422 m, Southern exposure, 45º slope, shrub oak vegetation, sun-exposed, on *Quercus pacifica*, young, on small branches, the oak was about 3' tall, leg. E. Gaya 02.26.10-8, F. Lutzoni (DUKE). | **KT291472** | **KT291523** | **KT291565** | **KT291604** | — | **KT291662** |
| | *Teloschistes hosseusianus* | GB/This study | Argentina, Villaciencio, 1.12.2007, leg. W.F. Morris (DUKE). | 394998711 | 394998546 | 394998604 | 394998778 | 394998872* | 394998872 |
| | *Teloschistes nodulifer* | This study | Peru, Tarma province, Capia, above Tarma village, S11º25'12.3" W75º40'39", 3138 m, open-exposed site, 50-60º slope, dry desert, soil in small hills mixed with basaltic, leg. E. Gaya 07.05.10-7, D. Ramos (DUKE). | — | **KT291524** | **KT291566** | **KT291605** | **KT291663** | **KT291663** |
| | *Teloschistes sieberianus* | GB/This study | Australia, New South Wales, secus viam ad "Coreys Cave" ducentem, 2 km ad septentriones et orientem a Wee Jasper (35º06' austr., 148º40' orient.), 400 m s. m. In ramulis silva (*Eucalyptus*). 12.08.1991, leg. H.T. Lumbsch & H. Streimann s.n. (DUKE, A. Vezda: Lichenes rariores exsiccati 30). | 183585275 | **KT291525** | — | — | **KT291664** | — |
| | *Xanthoria andina* | GB | Bolívia, Dpto. La Paz, Prov. Murillo, Laguna de Cota – Cota (calle 31), sector frente a la puerta principal, 16º32'24.8"S 68º04'01.7"W, 3750 m elev., Puna and Altoandina vegetation, on *Populus balsamifera*, 8.2.2002, leg. Canseco A-113 (LPB-B). | 394998717 | 394998557 | 394998616 | — | 394998894 | 394998894 |
| **(Xanthorioideae)** | *Caloplaca altoandina* (sub *C. squamosa* s.l. in GB) | GB/This study | Argentina, Villaciencio, 1.12.2007, leg. W. Morris (DUKE). | 394998691 | — | 394998587 | 394998754 | 394998836* | 394998836 |
| | *Caloplaca arnoldii* ssp. *obliterata* | GB | Sweden, Halland, Varberg, Vendelsö island, 57º17'54.53"N 12º 07'29.68"E, 0-2 m elev., on siliceous rocks, 9.8.2006, leg. E. Gaya, P. Navarro-Rosinés, U. Arup, U. Sochting, N. Hladun, A. Gómez-Bolea (BCN). | 394998682 | 394998506 | 394998572 | 394998734 | 394998806 | 394998806 |
| | *Caloplaca bolacina* | GB/This study | Mexico, Baja California sur, Sta Rosalia - Guerrero Negro, Desierto de Vizacíno, Llano El Angel, N of San Ignacio, 3,5 km from highway 1 along road to punta Abreojos, 27º15'N 113º11'W, 60-260 m, volcanic rocks, 21.02.1993, leg. Pere Navarro-Rosinés (BCN-Lich 12532). | 183585246 | **KT291480** | **KT291534** | — | **KT291617** | **KT291617** |
| | *Caloplaca coralloides* | This study | USA, California, Santa Barbara, San Miguel Island, secondary point at the beginning (N-side) of Harris Point, 34.07083(34º4'15"N)-120.35972 (120º21'35"W), 30 m (98ft), acidic rock, 15 March 1998, leg. T.H. Nash III 41158 (ASU 511740). | **KT291451** | **KT291485** | **KT291539** | — | **KT291625** | — |
| | *Caloplaca coronata* | GB | Spain, Almería, ENE of Almería, N rim of Sierra Cabrera, W of Mojácar, W of Turre, road AL150, near bridge over Rio de Aguas, 1º55'97"W 37º 08'48"N, 90 m elev., N exposed rocky and grassy slope with some shrubs and *Chamaeops humilis*, terricolous and mostly low outcrops, on vertical shaded low outcrop, 5.9.2007, leg. P. & B. v.d. Boom 38374 (P.v.d. Boom Herb.). | — | 394998513 | 394998578 | — | 394998820 | — |
| | *Caloplaca crenulatella* | This study | USA, California, end of Morris Ranch Road above Cedar Springs Trail, 33º39.373'N 116º35.056'W, 1559 m, chaparral and yucca, completely open-exposed site, slope 50º, dry, on limestone, leg. E. Gaya 02.24.10-23 & F. Lutzoni (DUKE). | **KT291452** | **KT291486** | — | — | — | **KT291626** |
| | *Caloplaca* aff. *durietzii* | This study | USA, California, Saint Jacinto mountains, Highway 74, on the other side of the road from, along the pacific crest trail, 4 1/2 from Table Mountain road, 33º33.753'N 116º34.649'W, 1493 m, desert chaparral, dry, sun-exposed, flat, on *Quercus* with leaves, Leg. E. Gaya 02.25.10-4 & F.Lutzoni (DUKE). | **KT291442** | **KT291481** | **KT291535** | **KT291574** | **KT291618** | **KT291618** |
| | *Caloplaca granulosa* | GB/This study | Spain, Catalonia, Tarragona prov., Conca de Barberà, Vimbodí, la Pena (Serra de Prades), under l'Àliga peak, near Roca de les Abelles, 31TCF3980, 900-1000 m, rainwater runoff on calcareous vertical walls, 18.01.2001, leg. E. Gaya 223 & X. Llimona (BCN 13702). | 183585250 | **KT291491** | **KT291544** | **KT291583** | — | **KT291631** |

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| | *Caloplaca ignea* | This study | USA, California, Sta Cruz Island, along road linking the duck and the ranch along river, open oak forest, 34º0.017'N 119º 45.097'W, 46 m, shady, 25º slope, very humid, on small boulder embebed in soil about 1 m above water level of creek, leg. E. Gaya 02.27.10-9 & F. Lutzoni (DUKE). | **KT291458** | **KT291492** | **KT291545** | — | **KT291632** | **KT291632** |
| | *Caloplaca impolita* | This study | USA, California, Sta Cruz Island, along road in Cristy Canyon, Centinella grave, 34º00.955'N 119º48.096'W, 330 m, Southern exposure, 70º slope, low shrub *Artemisia* and shrub oak, on volcanic rock, leg. E. Gaya 02.26.10-5 & F. Lutzoni (DUKE). | **KT291459** | **KT291493** | **KT291546** | **KT291584** | **KT291633** | **KT291633** |
| | *Caloplaca inconnexa* | GB/This study | France, Provence, prov. De Bouches-du-Rhône, Mimet, Col d'Ange, 500 m E de Pilon-du-Roi, 600-670 m, calcareous rocks, parasite on *Aspicilia calcarea* (BCN 13375). | 183585267 | **KT291494** | **KT291547** | — | **KT291634** | — |
| | *Caloplaca inconnexa* ssp. *nesodes* | This study | USA, California, Sta Cruz Island, along the road linking the duck and the ranch along river, 33º59.955'N 119º42.8991'W, 46 m, oak forest, slope 45º, volcanic rock, on terrace of a sunlit block, leg. E. Gaya 02.27.10-7 & F. Lutzoni (DUKE). | **KT291457** | **KT291495** | **KT291548** | **KT291585** | **KT291635** | **KT291635** |
| | *Caloplaca luteoalba* | This study | Sweden, Halland, Övraby, Sperlingsholm, 56º42'28.96"N 12º 53'46.93"E, 32 m, epiphyte on *Ulmus glabra*, 9.8.2006, leg. E. Gaya, P. Navarro-Rosinés, U. Arup, U. Sochting, N. Hladun, A. Gómez-Bolea (BCN). | **KT291461** | **KT291496** | **KT291549** | **KT291586** | — | — |
| | *Caloplaca* aff. *luteominia* | This study | USA, California, San Bernardino mountains, Cactus Flats, road 18, after Big Bear city, rocky hill, 34º18.879'N 116º48.495'W, 1863 m, Joshua tree with *Juniper* and oaks, 45º of slope, on granitic boulders, carbonated, on sides of rainwater runoff, leg. E. Gaya 02.23.10-17, F. Lutzoni (DUKE). | **KT291443** | **KT291478** | **KT291533** | **KT291573** | **KT291615** | **KT291615** |
| | *Caloplaca marina* | GB | U. Arup and M. Grube (1999). | 13242210 | | | — | — | — |
| | | GB/AFToL -4819 | Finland, Uusimaa, Kirkkonummi, Porkkala, Vetokannas, 59°59'N 24°25'E, on bare seashore cliffs, 7.4.2005, leg. S. Stenroos 5686 (H). | | 394998518 | 394998582 | — | — | — |
| | *Caloplaca maritima* | GB/This study | Spain, Catalonia, Girona prov., Llançà, Cau del Llop, surface facing North, 10º-30º slope, 3-5 m, 11.01.2001, leg. E. Gaya 243b & X. Llimona (BCN). | 183585247 | **KT291498** | **KT291551** | — | — | — |
| | *Caloplaca marmorata* | GB/This study | France, Provence, Var, Massif de la Ste. Baume, Plan d'Aups, entre l'Hostellerie de la Ste. Baume et le Vallon de Castelette, sun-exposed calcareous rocks, 10.06.2002, leg. E. Gaya 416 & C. Gueidan (BCN) | 183585241 | **KT291500** | **KT291553** | — | — | **KT291638** |
| | *Caloplaca millegrana* | This study | Antarctica, leg. Ulrik Sochting | — | **KT291502** | — | **KT291588** | **KT291640** | **KT291640** |
| | *Caloplaca ochracea* | GB/This study | Spain, Catalonia, Lleida prov., Spain, Catalonia, Fígols i Alinyà, shadow part of Tossa de Cambrils, 1560-1620 m, 31TCG69, *Pinus sylvestris* forest, calcareous rocks and boulders, 19.9.2001, leg. P. Navarro-Rosinés (BCN). | 394998688 | 394998519 | 394998583 | — | **KT291641** | — |
| | *Caloplaca polycarpa* | GB/This study | France, Provençe, near Apt, between Rocsalière and Les Claperèdes, 500 m elev., upper part of calcareous wall, flat sun-exposed surface, facing East, 11.06.2002, leg. E. Gaya 399, C. Roux & P. Navarro-Rosinés (BCN). | 183585251 | **KT291506** | **KT291556** | **KT291591** | **KT291645** | **KT291645** |
| | *Caloplaca scopularis* | GB | Scotland, West Ross (VC 105), Torridon, Rubha na h-Airde Glaise, and coast to north, locally abundant on rocky hevalland, grid. 18/80.56, 24.06.1994, leg. B.J. Coppins 16458, A.M. O'Dare & A.M. Fryday (E 126410). | 183585266 | | | — | 394998830 | — |
| | | GB/AFToL -4820 | Finland, Uusimaa, Kirkkonummi, Porkkala, Vetokannas, 59°59'N 24°25'E, on bare seashore cliffs, 20.4.2005, leg. S. Stenroos 5683 (H). | | 394998520 | 394998584 | — | — | — |
| | *Caloplaca* sp. 148 | This study | Mexico, along road, between Ciudad Constitution and Puerto San Carlos, 25º02.337'N 111º45.814'W, 41 m, shrubs with legumes, cactuses, and *Fulqueria*, sun exposed site, flat, humid, on alive part of *Fulqueria*, leg. E. Gaya 03.04.10-12 & F. Lutzoni (DUKE). | **KT291464** | **KT291509** | **KT291559** | — | **KT291648** | — |
| | *Caloplaca trachyphylla* | GB/This study | Pakistan (Northern Areas), NorthWestern Himalaya: rocky slopes in the gorge W, above Jutial (near Gilgit), ±1900 m, 20.07.1991, leg. J. Poelt s.n. (GZU). | 183585271 | **KT291513** | — | **KT291596** | **KT291652** | **KT291652** |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | *Caloplaca verruculifera* | GB | Iceland, INo. Eyjafjardarsysla, Silastadatangi, 65.726ºN 18.143ºW, ca. 1 m elev., marine habitat, 10.6.2006, leg. F. Lutzoni & C. Gueidan 06.10.07-7 (DUKE). | 394998694 | 394998525 | 394998589 | — | 394998842 | 394998842 |
| | *Xanthomendoza borealis* | This study | East Antarctica, Hallett Peninsula, Cape Hallett, Ross Sea coast of Victoria Land, S 72.3167° E 170.2667°, 2006, leg. P. Crittenden (DUKE). | **KT291473** | **KT291526** | **KT291567** | **—** | **KT291665** | **KT291665** |
| | *Xanthomendoza fallax* | GB | Alaska, 19.6.2007, leg. E. Gaya, J. Geml, J. Gomà (DUKE). | 394998712 | 394998547 | 394998605 | 394998780 | 394998874 | 394998874 |
| | *Xanthomendoza mendozae* | GB | Bolivia, Potosí, Salar de Uyuni, Isla Inca Huasi, 20°14'39.0"S 67°37'36.1"W, 3650 m elev., on basaltic rock, leg. V. Reeb, VR 11-V-02-14 (DUKE). | 394998713 | 394998548 | 394998606 | — | — | 394998876 |
| | *Xanthomendoza montana* | This study | USA, Arizona, Mohave County, Grand Canyon Parashant National Monument, 36º40'41"N 113º37'52"W, habitat pinyon juniper woodland, on decorticate wood *Ephedra* sp., Sandstone bluff, 20 May 2003, Collected by K.G. Sweat #KGS136A, other Collectors: S.T. Bates, B.A. Iselin & T.H. Nash III (ASU 574356). | **KT291474** | **KT291528** | **KT291569** | — | — | — |
| | *Xanthomendoza oregana* | This study | USA, California, Santa Monica mountains, Rocky Oaks National Park service property, along the trail starting at the parking lot, at the 'brown house' just outside the fence around the house, 34º05.853'N 118º48.968'W, 516 m, open grassy area, sun-exposed site, dry, flat slope, on *Juglans californica* tree#4, leg. E. Gaya 03.01.10-18C & F. Lutzoni (DUKE). | — | **KT291527** | **KT291568** | **KT291606** | — | **KT291666** |
| | *Xanthomendoza poeltii* | GB | Sweden, Halland, Övraby, Sperlingsholm, 56º42' 28.96"N 12º 53'46.93"E, 32 m elev., epiphyte on *Ulmus glabra*, 9.8.2006, leg. E. Gaya, P. Navarro-Rosinés, U. Arup, U. Sochting, N. Hladun, A. Gómez-Bolea (BCN). | 394998714 | 394998550 | 394998608 | 394998782 | 394998878 | 394998878 |
| | *Xanthomendoza ulophyllodes* | GB | USA, Minnesota, Itasca State Park, R. Honegger 330t1 (Z+ZT). | 222352298 | | | — | | |
| | | GB | Russia, 2006, leg. Urbanavichus (H; A. Thell s.n.). | | 196174856 | | — | | |
| | | GB | USA, WI, Vilas co., Town of Land O'Lakes, Northern Highland State Forest, Johnson Lake Barrens State Natural Area just east of Jute Lake, NNE of Woodruff, 46º08'57"N 89º30'03"W, 545 m elev., open jack pine-aspen woods with *Prunus* and burned stumps, on dry wood, 26.4.2002, leg. R. Egan EL-15, 811 (OMA). | | | 394998609 | — | 394998880 | 394998880 |
| | *Xanthomendoza weberi* | This study | USA, North Carolina, Wake Co., Pleasants'yard, just north of Turnipseed Preserve, rural yard facing fallow agricultural field, sunny, 35º44'52"N 78º25'16"W, ca. 73 m elevation, on trunk of large oak, 02 Apr 2011, leg. Gary B. Perlmutter #2685, det. Gary B. Perlmutter (NCU). | — | **KT291529** | — | **KT291607** | — | **KT291667** |
| | *Xanthopeltis rupicola* | This study | Chile, Metropolitan Region, Cordillera Province, San José de Maipo municipality, 63km E of Santiago, following the road El Volcán, lat 33º 49' 47.3"S long 70º05'09.4"W, +/- 3 m, ca. 1759 m, saxicolous, in open well lit areas. Type locality. 10 Apr 2011 Leg R. Vargas 3638 & A. Ugarte, det R. Vargas. | — | **KT291530** | **KT291570** | **KT291608** | — | **KT291668** |
| | *Xanthoria aureola* | GB | Sweden, Bohuslän, Kungshamn par., Sunnerskär, 58º19'42.53"N 11º14'48.12"E, 5 elev., granitic islands, 11.8.2006, leg. E. Gaya, P. Navarro-Rosinés, U. Arup, U. Sochting, N. Hladun, A. Gómez-Bolea (BCN). | 394998715 | 394998551 | 394998610 | 394998784 | 394998882 | 394998882 |
| | *Xanthoria calcicola* | GB/This study | Spain, Catalonia, Montgrí, Cap d'Oltrera, 31TEG15, on calcareous rocks, 26.5.2006, leg. X. Llimona, S. Fernández-Brime et al. (BCN). | **KT291475** | 394998552 | 394998611 | **KT291609** | 394998884 | 394998884 |
| | *Xanthoria candelaria* | GB | France, Auvergne, Puy de Dôme, Chastreix, Puy Gros, 1793 m elev., Long E=0.530 gr. lat. 50.578 gr., Pelouses au N (cirque de la Fontaine Salée) et au sud, barre rocheuse exp. N et S., 30.8.1993, leg. X. Llimona, A. Gómez-Bolea & P. Navarro-Rosinés (BCN 8444). | 183585245 | | | | | |
| | | GB | Sweden, Halland, Varberg, Vendelsö island, 57º17'54.53"N 12º 07'29.68"E, 0-2 m elev., on siliceous rocks, 9.8.2006, leg. E. Gaya, P. Navarro-Rosinés, U. Arup, U. Sochting, N. Hladun, A. Gómez-Bolea (BCN). | | 394998553 | 394998612 | 394998786 | 394998886 | 394998886 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | *Xanthoria elegans* | GB | Spain, Catalonia, Lleida prov., Alt Urgell, Fígols i Alinyà, Collada de l'Estany, near Cadolla Verda, 31TCG7167, 1700- 1800 m elev., sun-lit calcareous boulders, 14.4.2000, leg. E. Gaya 192 (BCN). | 183585262 | | | | | |
| | | GB | USA, Alaska, Elliott Hway, on calcareous boulder, 22.7.2007, leg. E. Gaya, J. Geml, J. Gomà (DUKE). | | 394998554 | 394998613 | 394998788 | 394998888 | 394998888 |
| | *Xanthoria parietina* | GB | Sweden, Bohuslän, Kungshamn par., Sunnerskär, 58°19'42.53"N 11°14'48.12"E, 5 elev., granitic islands, 11.8.2006, leg. E. Gaya, P. Navarro-Rosinés, U. Arup, U. Sochting, N. Hladun, A. Gómez-Bolea (BCN). | 394998716 | 394998555 | 394998614 | | 394998890 | 394998890 |
| | *Xanthoria polycarpa* | GB | Switzerland, Zurich, R. Honegger 215 (Z+ZT). | 222352275 | | | | | — |
| | | GB | Sweden, Öland, Gräsgård par., E of the wall, S of the road SE Tingstenen,56°21'05.33"N 16°28'07.07'E, 14 m elev., calcareous soils and rocks (Ordovician), 12.8.2006, leg. E. Gaya, P. Navarro-Rosinés, U. Arup, U. Sochting, N. Hladun, A. Gómez-Bolea (BCN). | | 394998556 | 394998615 | 394998792 | 394998892 | — |
| | *Xanthoria tenax* | This study | USA, California, Santa Monica mountains, Rocky Oaks National Park service property, along the trail starting at the parking lot, at the 'brown house' just outside the fence around the house, 34°05.853'N 118°48.968'W, 516 m, open grassy area, sun-exposed site, dry, flat slope, on *Juglans californica* tree#4, leg. E. Gaya 03.01.10-18A & F. Lutzoni (DUKE). | — | **KT291531** | **KT291571** | **KT291610** | **KT291669** | **KT291669** |

**Table S4.** Synopsis of alignment lengths, number of analyzed characters, number of constant and variable characters included, substitution models used for each locus, and missing sequences **(**absolute numbers of missing sequences and percentage of missing sequences with respect to the total number of sequences per dataset).

| Locus | Alignment length | Included char. | Constant char. | Variable char. | Subst. models | Missing seq. | % Missing seq./total |
|---|---|---|---|---|---|---|---|
| 5.8S | 155 | 150 | 121 | 29 (17) | SYM + G | 15 | 13.89% |
| mitSSU | 940 | 592 | 417 | 175 (123) | HKY + I + G | 7 | 6.48% |
| nucLSU | 2979 | 1189 | 872 | 317 (188) | GTR+ I + G | 22 | 20.37% |
| *RPB*1 [A-D] | 1146 | 1038 | 509 | 529 (487) | GTR+ I + G | 38 | 35.19% |
| *RPB*2 [5-7] | 824 | 753 | 323 | 430 (394) | GTR+ I + G | 30 | 27.78% |
| *RPB*2 [7-11] | 975 | 921 | 516 | 405 (370) | GTR+ I + G | 25 | 23.15% |
| **Combined data** | 7019 | 4643 | 2758 | 1885 (1579) | --- | 137 | 21.14% |

**Table S5.** List of taxon sets included in the dating analysis of the eukaryotes dataset. Nodes that were constrained as monophyletic based on previous results (15) in the starting tree in BEAST are denoted by 'yes'. Asterisks indicate splits that were calibrated in this study.

| Taxon sets | monophyly |
|---|---|
| Eudicots-Monocots* | yes |
| Viridiplantae | yes |
| Apicomplexa | yes |
| Stramenopiles | yes |
| Animalia/Choanoflagellida-Fungi* | yes |
| Animalia-Choanoflagellida | yes |
| Animalia | yes |
| Chordata-Urochordata* | yes |
| Fungi | yes |
| Euchytrids | yes |
| Blastocladiomycota* | yes |
| Zygomycota | yes |
| Glomeromycota-Mucormycotina* | no |
| Mucormycotina | yes |
| Glomeromycota | yes |
| Basidiomycetes-Ascomycetes | yes |
| Basidiomycetes | yes |
| Pucciniomycotina | yes |
| Ustilaginomycotina | yes |
| Agaricomycotina | yes |
| Marasmiaceae-Pleurotaceae* | no |
| Mycenaceae-Agaricaceae* | no |
| Ascomycetes | yes |
| Saccharomycotina | yes |
| Pezizomycotina | yes |
| Orbiliomycetes | yes |
| Pezizomycetes-Leotiomyceta* | no |
| Pezizomycetes | yes |
| Leotiomyceta | yes |
| Dothideomycetes-Arthoniomycetes* | no |
| Sordariomycetes | yes |
| Leotiomycetes | yes |
| Eurotiomycetes | yes |
| Eurotiales-Onygenales | yes |
| Pyrenulales | yes |
| Verrucariales | yes |
| Chaetothyriomycetidae | yes |
| Chaetothyriales | yes |
| Lecanoromycetes | yes |
| *Anzia-Canoparmelia** | yes |
| Teloschistales | yes |
| Peltigerales | yes |

**Table S6.** List of the ten calibrations used in this study (eukaryotes dataset) following (15) with a few modifications. For fossil data we included information on their age, locality and publication. For each calibration, the parameters used to set the priors are provided.

| Node | Species | Calibration | Date (myr) | Geological period | Locality | Publication* | Calibration prior | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | Mean | Log(stdev) | Offset |
| | **Basal fungal lineages** | | | | | | | | |
| 1 | Arbuscular mycorrhizal fungi | Split Glomeromycota-Mucormycotina | 460 | Ordovician | Wisconsin | Redecker *et al.* 2000 (22) | 460[a] | 0.2 | 90 |
| 2 | *Allomyces* | Split *Allomyces-Physoderma* | 400 | Devonian | Scotland | Taylor *et al.* 1994 (23) | 400[a] | 0.2 | 5 |
| | **Basidiomycetes** | | | | | | | | |
| 3 | *Archaeomarasmius leggetti* | Split Marasmiaceae-Pleurotaceae | 90-94 | mid Cretaceous | New Jersey | Hibbett *et al.* 1997 (24) | 92[a] | 0.2 | 45 |
| 4 | *Protomycena electra* | Split Mycenaceae-Agaricaceae | 15-20 | Miocene | Dominican Rep. | Hibbett *et al.* 1997 (24) | 17.5[a] | 0.2 | 10 |
| | **Ascomycetes** | | | | | | | | |
| 5 | *Palaeopyrenomycites devonicus* | Split Pezizomycetes-Leotiomyceta | 400 | lower Devonian | Scotland | Taylor *et al.* 1999 (25) | 400[a] | 0.2 | 160 |
| 6 | *Anzia electra* | Split *Anzia-Canoparmelia* | 40 | Tertiary, Eocene | Baltic | Rikkinen & Poinar 2002 (26) | 40[a] | 0.2 | 30 |
| 7 | Sooty molds and *Curvularia*-type spores | Split Dothideomycetes-Arthoniomycetes | 93-95 | mid Cenomanian | Ethiopia | Schmidt *et al.* 2010 (27) | 94[a] | 0.2 | 72 |
| | **Plants** | | | | | | | | |
| 8 | Appearance of tricolpate pollen | Split Eudicots-Monocots | 125 | early Cretaceous | Worldwide | Crane *et al.* 1995 (28) | 125[b] | 0.2 | - |
| | **Secondary calibrations** | | | | | | | | |
| 9 | Split Urochordata-Chordata | Molecular-based calibration | 600 (565-643) | Precambrian | - | Douzery *et al.* 2004 (29) | 600[b] | 0.2 | - |
| 10 | Split Fungi-Animalia/Choanoflagellida | Molecular-based calibration | 983 (872-1127) | Precambrian | - | Douzery *et al.* 2004 (29) | 983[a] | 0.0715 | 15 |

a For priors using a log normal distribution, the mean, the log(standard deviation) and the value of the offset are provided.

b For priors using a normal distribution, only the mean and the log(standard deviation) are given.

***** For references, please see supplementary references list (above).

**Table S7.** List of nine calibrated nodes obtained from the first-step dating analysis (Fig. S6; eukaryotes dataset) and used as constraints in the dating analysis of the Teloschistales dataset (Fig. S1).

| Node | Calibration | Calibration prior | |
|---|---|---|---|
| | | Mean (Mya) | Log(stdev) |
| A | Split Megalosporaceae and Teloschistaceae | 148.7 | 16 |
| B | Split *Megalospora-Megaloblastenia* | 75.1 | 18 |
| C | Split *Brigantiaea leucoxantha- B. tricolor* | 10.6 | 3.7 |
| D | Split *Letrouitia domingensis - L. vulpina* | 13.9 | 4.5 |
| E | Split Brigantiaeaceae-Letrouitiaceae | 94.5 | 20 |
| F | Split *Caloplaca - Huea* | 59.3 | 14.5 |
| G | Split *Caloplaca - Huea* and *Ioplaca* | 88.1 | 14 |
| H | Split *Caloplaca - Xanthoria* | 43.5 | 8.4 |
| I | Split *Caloplaca - Xanthoria* and *Xanthomendoza* | 72.5 | 11.5 |

**Table S8.** Divergence time estimates for the main splits in the Teloschistales. For each divergence, the mean and the 95% confidence interval are reported. The results are provided in millions of years (Mya). The node numbers provided in this table were also used in Fig. S1 to show their placement in the chronogram.

| Node | Age | 95% confidence interval |
|---|---|---|
| 1 | 162.22 | 193.19 - 132.84 |
| 2 | 144.63 | 167.72 - 122.56 |
| 3 | 98.48 | 113.47 - 82.73 |
| 4 | 90.21 | 104.86 - 75.53 |
| 5 | 85.65 | 99.43 - 71.82 |
| 6 | 83.25 | 104.25 - 63.29 |
| 7 | 81.00 | 102.95 - 60.80 |
| 8 | 71.91 | 85.00 - 58.51 |
| 9 | 65.31 | 82.78 - 47.87 |
| 10 | 62.61 | 74.03 - 51.85 |
| 11 | 57.33 | 67.53 - 47.11 |
| 12 | 50.63 | 68.82 - 33.65 |
| 13 | 43.01 | 50.01 - 36.11 |
| 14 | 16.53 | 21.40 - 11.84 |

**Table S9**. Harmonic means and Bayes Factors from comparison between best models in BayesTraits analyses for the different traits examined. Comparisons were between Reversible Jump Hyper Prior (RJHP), and unconstrained model without RJHP, and a constrained model with equal rates (qAB=qBA).

| BayesTraits | ANTHRA THALLUS | ANTHRAQUINONES | SHADE | ROCK | BARK | CRUST. CONTINUOUS | ATTACH. STRUCTURES |
|---|---|---|---|---|---|---|---|
| **RJHP analyses** | | | | **Harmonic mean** | | | |
| hpall="exp 0 0.1", rjhp="exp 0 0.1 | -31.57859 | -17.52897 | **-53.964481** | -59.09209 | **-62.57761** | -63.86969 | **-41.54682** |
| hpall="exp 0 1", rjhp="exp 0 1" | -31.51565 | -17.40939 | -55.349016 | **-57.03865** | -63.0575 | -66.21248 | -41.61517 |
| hpall="exp 0 10", rjhp="exp 0 10" | **-31.41062** | -17.61419 | -54.00728 | -60.11743 | -64.177 | -65.17292 | -41.63654 |
| hpall="exp 0 100", rjhp="exp 0 100" | -31.45092 | -31.33212 | -55.005814 | -57.82174 | -65.38471 | -67.06816 | -41.56381 |
| hpall="exp 0 0.01", rjhp="exp 0 0.01" | -62.52974 | -31.26221 | -57.87086 | -67.61668 | -62.66752 | **-62.85751** | -51.00922 |
| **Unconstrained analyses** | | | | **Harmonic mean** | | | |
| hpall="exp 0 0.1" | -33.82467 | -18.28087 | **-54.30109** | **-57.91602** | **-64.0783** | **-63.05631** | **-39.74294** |
| hpall="exp 0 1" | -32.66864 | -19.19641 | -56.655326 | -61.65305 | -66.6843 | -64.82426 | -40.67598 |
| hpall="exp 0 10" | **-32.49832** | -20.19122 | -58.266982 | -66.70843 | -70.89303 | -65.82882 | -46.0865 |
| hpall="exp 0 100" | -62.49694 | -31.33216 | -58.193431 | -67.79769 | -70.94169 | -73.08366 | -44.12625 |
| hpall="exp 0 0.01" | -63.089 | -31.62883 | -57.749151 | -68.01018 | -71.07046 | -74.14817 | -51.97639 |
| **Constrained qAB=qBA analyses** | | | | **Harmonic mean** | | | |
| hpall="exp 0 0.1" | **-31.17908** | -17.66699 | -52.95457 | **-56.6563** | -63.654 | -63.37114 | -41.64833 |
| hpall="exp 0 1" | -31.34681 | -18.13877 | -57.83131 | -56.86561 | -66.78067 | -67.33973 | -41.4634 |
| hpall="exp 0 10" | -31.34779 | -17.33716 | -54.17114 | -57.42203 | -67.91257 | -66.76336 | -41.43208 |
| hpall="exp 0 100" | -31.54685 | -17.73291 | -59.05591 | -57.23471 | -65.08637 | -66.26756 | -41.31742 |
| hpall="exp 0 0.01" | -31.61472 | -17.93936 | **-52.84167** | -56.85294 | **-62.62203** | **-62.83** | **-40.83503** |
| **BF Comparisons Between Best Analyses** | | | | | | | |
| | bf.test(**qAB=qBA***, Unconstrained*) | bf.test(**qAB=qBA***, Unconstrained*) | bf.test(**qAB=qBA***, Unconstrained*) | bf.test(**qAB=qBA***, Unconstrained*) | bf.test(**qAB=qBA***, Unconstrained*) | bf.test(**qAB=qBA***, Unconstrained*) | bf.test(qAB=qBA*, **Unconstrained***) |
| | BF BestModel | BF BestModel | BF BestModel | BF BestModel | BF BestModel | BF BestModel | BF BestModel |
| | 2.638482 Model 1 | 1.887412 Model 1 | 2.91884 Model 1 | 2.51944 Model 1 | 2.91253 Model 1 | 0.45261 Model 1 | 2.184176 Model 2 |
| | bf.test(**qAB=qBA***, RJHP*) | bf.test(**qAB=qBA***, RJHP*) | bf.test(**qAB=qBA***, RJHP*) | bf.test(**qAB=qBA***, RJHP*) | bf.test(qAB=qBA*, **RJHP***) | bf.test(**qAB=qBA***, RJHP*) | bf.test(RJHP*, **Unconstrained***) |
| | BF BestModel | BF BestModel | BF BestModel | BF BestModel | BF BestModel | BF BestModel | BF BestModel |
| | 0.463072 Model 1 | 0.144462 Model 1 | 2.245622 Model 1 | 0.7647 Model 1 | 0.088846 Model 2 | 0.055006 Model 1 | 3.607764 Model 2 |

**Table S10**. Summary of log likelihood and AICs of the *corHMM* analyses considering different initial values used for the likelihood search (ip) and rate categories.

| ***corHMM*** | **rate.cat=1** | | | **rate.cat=2** | | | |
|---|---|---|---|---|---|---|---|
| | **-lnL** | **AIC** | **AICc** | **-lnL** | **AIC** | AICc | **ΔAICc** |
| **Anthra. Thallus** | | | | | | | |
| **ip=0.01** | -30.87712 | 65.75423 | **65.86852** | -29.49696 | 74.99393 | 76.44847 | -10.57995 |
| **ip=0.1** | -30.87719 | 65.75438 | 65.86867 | -29.64128 | 75.28256 | 76.7371 | -10.86843 |
| **ip=1** | -62.2987 | 128.5974 | 128.7117 | -59.23201 | 134.464 | 135.9186 | -7.2069 |
| **Anthraquinones** | | | | | | | |
| **ip=0.01** | -16.84495 | 37.6899 | 37.80418 | -14.35183 | 44.70366 | 46.15821 | -8.35403 |
| **ip=0.1** | -16.84463 | 37.68926 | **37.80355** | -15.42961 | 46.85921 | 48.31376 | -10.51021 |
| **ip=1** | -16.84502 | 37.69003 | 37.80432 | -15.45154 | 46.90308 | 48.35763 | -10.55331 |
| **Shade** | | | | | | | |
| **ip=0.01** | -53.29916 | 110.5983 | 110.7126 | -44.95643 | 105.9129 | **107.3674** | 3.3452 |
| **ip=0.1** | -53.29937 | 110.5987 | 110.713 | -50.07407 | 116.1481 | 117.6027 | -6.8897 |
| **ip=1** | -57.25084 | 118.5017 | 118.616 | -56.3503 | 128.7006 | 130.1551 | -11.5391 |
| **Rock substrate** | | | | | | | |
| **ip=0.01** | -56.68839 | 117.3768 | 117.4911 | -53.5715 | 123.143 | 124.5975 | -7.1064 |
| **ip=0.1** | -56.68799 | 117.376 | **117.4903** | -50.55073 | 117.1015 | 118.556 | -1.0657 |
| **ip=1** | -67.36646 | 138.7329 | 138.8472 | -66.59407 | 149.1881 | 150.6427 | -11.7955 |
| **Bark** | | | | | | | |
| **ip=0.01** | -62.45666 | 128.9133 | **129.0276** | -57.73942 | 131.4788 | 132.9334 | -3.9058 |
| **ip=0.1** | -62.45838 | 128.9168 | 129.031 | -59.14204 | 134.2841 | 135.7386 | -6.7076 |
| **ip=1** | -70.63774 | 145.2755 | 145.3898 | -61.38762 | 140.2298 | 140.2298 | 5.16 |
| **Crust. continuous** | | | | | | | |
| **ip=0.01** | -61.06412 | 126.1282 | **126.2425** | -59.04375 | 134.0875 | 135.542 | -9.2995 |
| **ip=0.1** | -61.06464 | 126.1293 | 126.2436 | -57.12944 | 130.2589 | 131.7134 | -5.4698 |
| **ip=1** | -61.06413 | 126.1283 | 126.2425 | -71.94724 | 159.8945 | 161.349 | -35.1065 |
| **Attach. Structure** | | | | | | | |
| **ip=0.01** | -38.33191 | 80.66382 | 80.77811 | -37.23463 | 90.46926 | 91.9238 | -11.14569 |
| **ip=0.1** | -38.33178 | 80.66357 | 80.77785 | -36.73539 | 89.47078 | 90.92532 | -10.14747 |
| **ip=1** | -38.33166 | 80.66332 | **80.7776** | -49.41205 | 114.8241 | 116.2786 | -35.501 |

Note: In all analyses node.states="marginal", n.cores=8, root.p="maddfitz", and compared with nstarts=100