SUPPLEMENTARY TABLE I. Specimen voucher information and Genbank accession or ID numbers for 68 ITS nrDNA sequences included in this study. Sequences directly retrieved from Genbank are marked by an asterisk (*) (Arup and Grube 1999, Dyer and Murtagh 2001, Kasalicky et al 2000, Lohtander et al 2000); all other sequences (60) were generated in this study or in previous studies of the first author (Gaya et al 2003, 2008). The latter 60 specimens were used in the morphology-based and combined analyses.

| **Taxon name** | **Voucher information** | **Genbank accession/ID number[1]** |
|---|---|---|
| *Caloplaca arnoldii* ssp. *arnoldii* (Wedd.) Zahlbr. 1 | France, Provence, Vaucluse, Apt, G. Clauzade s.n. (MARSSJ, herb. G. Clauzade, holotype) | EU639633 |
| *C. arnoldii* ssp. *arnoldii* 2 | Slovakia, Prešov, Belaer Tatra, Skalné Vráta, I. Pisút & J. Poelt s.n. (GZU) | HM800859 |
| *C. arnoldii* ssp. *arnoldii* 3 | Spain, Catalonia, Barcelona, l'Abella, E. Gaya 143 (BCN) | HM800861 |
| *C. arnoldii* ssp. *arnoldii* 4 | Spain, Catalonia, Tarragona, Conca de Barberà, Vimbodí, P. Navarro-Rosinés, E. Gaya 93 & N.L. Hladun (BCN 13716) | HM800862 |
| *C. arnoldii* ssp. *arnoldii* 5 | Spain, Catalonia, Tarragona, Conca de Barberà, Vimbodí, E. Gaya 227 & X. Llimona (BCN 13717) | HM800863 |
| *C. arnoldii* ssp. *arnoldii* 6 | Sweden, Jämtland, Härjedalen, Tännäs par., U. Arup L02302 (LD) | HM800864 |
| **C. arnoldii* ssp. *arnoldii* 7 [as *C. saxicola* in Genbank] | U. Arup & M. Grube (1999) | AF353951 |
| *C. arnoldii* ssp. *clauzadeana* Gaya | France, Provence,Vaucluse, Monieux, P. Navarro-Rosinés & Cl. Roux (MARSSJ, herb. Cl. Roux 21562-isotype) | HM800866 |
| *C. arnoldii* ssp. *nana* Gaya | Spain, Tarragona, Conca de Barberà, Vimbodí, E. Gaya 227b & X. Llimona (BCN 13717b) | HM800858 |
| *C. arnoldii* ssp. *obliterata* (Pers.) Gaya 1 | Austria, Carinthia, Nationalpark Nockberge, W. Petutschnig s.n. (GZU) | HM800869 |
| *C. arnoldii* ssp. *obliterata* 2 | Austria, Styria, Seetaler Alpen, H. Mayrhofer 13068 (GZU) | HM800865 |
| *C. arnoldii* ssp. *obliterata* 3 | France, Languedoc-Roussillon, Err, E. Gaya 372 & J. Torra (BCN) | HM800871 |
| *C. arnoldii* ssp. *obliterata* 4 | Scotland, East Lothian, Dunbar, B.J. | HM800855 |

| | | |
|---|---|---|
| | Coppins & A. Fletcher s.n. (E) | |
| *C. arnoldii* ssp. *obliterata* 5 | Scotland, East Lothian, Dunbar, B.J. Coppins & A. Fletcher s.n. (E) | HM800856 |
| *C. arnoldii* ssp. *obliterata* 6 | Scotland, Scottish Borders, Berwickshire, B.J. Coppins & A.M. O'Dare 15597 (BCN, dupl.) | HM800854 |
| *C. arnoldii* ssp. *obliterata* 7 | Scotland, East Lothian, North Berwick, B.J. Coppins 17021 & O.L. Gilbert (E 126408) | HM800857 |
| *C. arnoldii* ssp. *obliterata* 8 | Spain, Catalonia, Barcelona, Vallès Oriental, E. Gaya 420, N. Hladun & P. Hoyo (BCN) | HM800860 |
| *C. arnoldii* ssp. *obliterata* 9 | USA, Arizona, Pima County, Saguaro Nat. Mon. Rincon Mt. Section, C. Wetmore 54422 (MIN) | HM800868 |
| *C. arnoldii* ssp. *obliterata* 10 | USA, North Dakota, Billings County, Theodore Roosevelt National Park, C. Wetmore 80340 (MIN) | HM800872 |
| *C. arnoldii* ssp. *obliterata* 11 | USA, South Dakota, Custer County, Custer State Park, C. Wetmore 49879 (MIN) | HM800867 |
| *C. arnoldiiconfusa* Gaya & Nav.-Ros. 1 [as *C. arnoldii* in Genbank] | Austria, Styria, Nördliche Kalkalpen, J. Hafellner s.n. (GZU) | EU639635 |
| *C. arnoldiiconfusa* 2 | Austria, Salzburg, Nördliche Kalkalpen, J. Hafellner s.n. (GZU) | HM800875 |
| *C. arnoldiiconfusa* 3 | Austria, Styria, Tauern, U. Arup (Herb. Arup L97312) | HM800876 |
| *C. arnoldiiconfusa* 4 | Austria, Carinthia, Nockberge, J. Poelt s.n. (GZU) | HM800888 |
| *C. arnoldiiconfusa* 5 | Austria, Styria, Bruck an der Mur, J. Poelt s.n. (GZU) | HM800874 |
| *C. arnoldiiconfusa* 6 | Austria, Styria, Tauern, U. Arup (Herb. Arup L97313) | HM800873 |
| **C. arnoldiiconfusa* 7 [as *C. arnoldii* in Genbank] | Austria, U. Arup & M. Grube (1999) | AF353952 |
| *C. biatorina* 1 | Pakistan, Karakorum, Baltistan, J. Poelt s.n. (GZU) | HM800900 |

| | | |
|---|---|---|
| *C. biatorina* 2 | Spain, Catalonia, Lleida, Pallars Sobirà, Parc Nacional d'Aigüestortes, E. Gaya 267, A. Gómez-Bolea & X. Ariño (BCN) | HM800897 |
| *C. biatorina* 3 | Spain, Lleida, Pallars Sobirà, Espot, X. Llimona 364 (BCN) | HM800896 |
| *C. biatorina* 4 | Spain, Granada, Sierra Nevada, U. Søchting 9608 (BCN) | HM800895 |
| *C. biatorina* 5 | Spain, Girona, Ripollès, Vall de Núria, P. Navarro-Rosinés & E. Gaya 195 (BCN 13685) | EU639634 |
| *C. biatorina* 6 | Spain, Castilla-León, León, E. Gaya s.n. (BCN 13689) | HM800894 |
| *C. biatorina* 7 | USA, Arizona, Coconino County, T.H. Nash 35371 (MIN) | HM800901 |
| *C. biatorina* 8 | USA, Montana, Gallatin County, Gallatin National Park, C. Wetmore 81529 (MIN) | HM800898 |
| *C. biatorina* 9 | USA, Nebraska, Scotts Bluff County, Scotts Bluff National Monument, C. Wetmore 77535 (MIN) | HM800899 |
| **C. biatorina* 10 | U. Arup & M. Grube (1999) | AF353953 |
| *C. decipiens* (Arnold) Blomb. & Forssell 1 | Spain, Catalonia, Lleida, Segarra, P. Navarro-Rosinés s.n. (BCN 13692) | EU639637 |
| *C. decipiens* 2 | USA, Nebraska, Sioux County, Agate Fossil Beds National Monument, C. Wetmore 77865 (MIN) | EU639638 |
| *C. ignea* Arup 1 | Mexico, Baja California: San Quintín, C. Wetmore 72440 (MIN) | EU639648 |
| **C. ignea* 2 | U. Arup & M. Grube (1999) | AF353950 |
| *C. pusilla* (A. Massal.) Zahlbr. 1 | Slovakia, Prešov, Belaer Tatra, Skalné Vráta, I. Pisút & J. Poelt s.n. (GZU) | HM800890 |
| *C. pusilla* 2 | Spain, Catalonia, Tarragona, Conca de Barberà, Vimbodí, E. Gaya 226 & X. Llimona (BCN 13696) | EU639639 |
| *C. pusilla* 3 | Spain, Catalonia, Tarragona, Conca de Barberà, Vimbodí, P. Navarro-Rosinés, E. Gaya 224 & N.L. Hladun (BCN 13697) | HM800891 |
| *C. pusilla* 4 | Spain, Lleida, Segarra, Cervera, P. | HM800892 |

| | | |
|---|---|---|
| | Navarro-Rosinés s.n. (BCN 13713) | |
| *C. pusilla* 5 | Spain, Valencia, Castellón, Ares del Maestre, S. Fos s.n. (VAB-LICH. 10393) | HM800893 |
| *C. pusilla* 6 | USA, Minnesota, C. Wetmore 77237 (MIN) | HM800889 |
| *C. rouxii* Gaya, Nav.-Ros. & Llimona 1 | Austria, Carinthia, Gurtaler Alpen, H. Mayrhofer, J. Poelt, R. Türk, A. Vezda & H. Wittmann s.n. (GZU) | HM800885 |
| *C. rouxii* 2 | Spain, Catalonia, Lleida, Pallars Sobirà, Parc Nacional d'Aigüestortes, E. Gaya 273, A. Gómez-Bolea & X. Ariño (BCN) | HM800883 |
| *C. rouxii* 3 | Spain, Catalonia, Lleida, Alt Urgell, Fígols i Alinyà, P. Navarro-Rosinés 390 (BCN) | HM800884 |
| *C. saxicola s. str.* (Hoffm) Nordin 1 | Canada, Northwest Territories, Thomsen River, Banks Island, W. A. Gould 945 (MIN) | HM800882 |
| *C. saxicola s. str.* 2 | USA, Idaho, Owyhee County, B. McCune 19101 (MIN) | HM800879 |
| *C. saxicola s. str.* 3 | USA, Montana, Gallatin County, Yellowstone National Park, C. Wetmore 80703 (MIN) | HM800880 |
| *C. saxicola s. str.* 4 | USA, Montana, Gallatin County, Gallatin National Park, C. Wetmore 81491 (MIN) | HM800881 |
| *C. saxicola s. str.* 5 | USA, Nebraska, Sioux County, Agate Fossil Beds National Monument, C. Wetmore 77920 (MIN) | HM800877 |
| *C. saxicola s. str.* 6 | USA, Nebraska, Sioux County, Agate Fossil Beds National Monument, C. Wetmore 77946 (MIN) | HM800870 |
| *C. saxicola s. str.* 7 | USA, Nebraska, Sioux County, Agate Fossil Beds National Monument, C. Wetmore 77865 (MIN) | HM800878 |
| *C. saxicola s. str.* 8 | USA, Wyoming, Park County, Yellowstone National Park, C. Wetmore 81256 (MIN) | EU639636 |
| *C. saxicola s. str.* 9 | USA, Wyoming, Park County, Yellowstone National Park, leg C. Wetmore 80927 (MIN) | HM800887 |

| | | |
|---|---|---|
| *C. saxicola s. str.* 10 | USA, Wyoming, Teton County, Yellowstone National Park, C. Wetmore 80858 (MIN) | HM800886 |
| **C. saxicola s. str.* 11 [as *X. elegans* in Genbank] | Antarctica, Vestfold Hills, P.S. Dyer & G.J. Murtagh (CABI, UK Centre, IMI 384688) | AF278753 |
| *C. schistidii* (Anzi) Zahlbr. 1 | Spain, Catalonia, Lleida, Alt Urgell, Fígols i Alinyà, E. Gaya 245 & X. Llimona (BCN 13794) | AY233225 |
| **C. schistidii* 2 | Italy, P.L. Nimis & M. Tretiach (TSB 24042) | AF279881 |
| **C. schistidii* 3 | Romania, M. Zamfir (UPS 125981) | AF279882 |
| *Xanthoria candelaria* (L.) Th. Fr. | France, Auvergne, X. Llimona, A. Gómez-Bolea & P. Navarro-Rosinés 3b (BCN 8444) | EU639625 |
| *X. elegans* (Link.) Th. Fr. | Spain, Catalonia, Lleida, Alt Urgell, Fígols i Alinyà, E. Gaya 192 (BCN) | EU639642 |
| *X. sorediata* (Vain.) Poelt 1 | Spain, Catalonia, Lleida, Pallars Sobirà, Parc Nacional d'Aigüestortes, E. Gaya 367, A. Gómez-Bolea & X. Ariño (BCN) | EU639643 |
| **X. sorediata* 2 | Sweden, Tehler 7883 (S) | AF224348 |

[1] GenBank accession numbers are provided for all sequences generated for this study. A GenBank ID number is provided for all sequences retrieved from GenBank.

SUPPLEMENTARY TABLE II. Data matrix for phenotypic and ecological traits. Characters and character states are described in APPENDIX 3. ? = character state unknown or not applicable. In some taxa, for certain highly polymorphic characters, multiple character states have been assigned and have been analyzed as such: A = 0&1; B = 0&2; C = 1&2; D = 1&5; E = 1&6; F = 2&3; G = 3&4; H = 3&5, I = 4&5, J = 4&7; K = 5&7; L = 6&7; M = 7&8; N = 0&1&2; O = 0&1&3; P = 1&2&3; Q = 1&3&6; R = 2&3&5; S = 4&7&8; T = 2&3&4&5; U = 3&4&5&6; V = 1&3&4&5&6. A few characters are coded as uncertain and analyzed as: W = 0/1. These polymorphsims and uncertainties have been analyzed differently using the "VARIABLE" option in PAUP*.

| | 1 | | | | | | | | | | 2 | | | | | | | | | | 3 | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **OTU** | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| *C. arnoldii* ssp. *arnoldii* 1 | 0 | A | 0 | 1 | U | 1 | C | 0 | 0 | 0 | 1 | 1 | 0 | 1 | A | 1 | 2 | 0 | 0 | 0 | 1 | 0 | 1 | 1 | H | A | 0 | 0 | 0 | 1 | 1 | 0 | 1 | 0 | 1 | 1 | 0 | 0 |
| *C. arnoldii* ssp. *arnoldii* 2 | 0 | A | 0 | 1 | U | 1 | C | 0 | 0 | 0 | 1 | 1 | 0 | 1 | A | 1 | 2 | 0 | 1 | 0 | 1 | 0 | 1 | 1 | H | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 1 | 0 | 0 | 0 |
| *C. arnoldii* ssp. *arnoldii* 3 | 0 | A | 0 | 1 | U | 0 | C | 0 | 0 | 0 | 1 | 1 | 0 | 1 | A | 1 | 2 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | H | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| *C. arnoldii* ssp. *arnoldii* 4 | 0 | A | 0 | 1 | U | 1 | C | 0 | 0 | 0 | 1 | 1 | 0 | 1 | A | A | 2 | 0 | 1 | 0 | 1 | 0 | 1 | 1 | H | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 1 | 0 | 0 |
| *C. arnoldii* ssp. *arnoldii* 5 | 0 | A | 0 | 1 | U | 1 | C | 0 | 0 | 0 | 1 | 1 | 0 | 1 | A | A | 2 | 0 | 0 | 0 | 1 | 0 | 1 | 1 | H | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| *C. arnoldii* ssp. *arnoldii* 6 | 0 | A | 0 | 1 | V | A | C | 0 | 0 | 0 | 1 | 1 | 0 | 1 | A | 1 | 2 | 0 | 0 | 0 | 1 | 0 | 1 | A | H | A | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | W |
| *C. arnoldii* ssp. *clauzadeana* | 0 | A | 1 | 1 | 6 | 1 | 2 | 0 | 0 | 0 | 1 | 1 | 0 | C | 0 | A | 1 | 0 | 1 | 0 | 1 | N | 1 | 1 | 5 | A | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 1 | 1 | 1 | 0 |
| *C. arnoldii* ssp. *nana* | 0 | 1 | 0 | 1 | 1 | 1 | C | 0 | 0 | 0 | 1 | A | 0 | A | A | 1 | 1 | 0 | 0 | 0 | 1 | 0 | A | 1 | P | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| *C. arnoldii* ssp. *obliterata* 1 | 0 | A | 0 | 1 | 5 | 0 | 2 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | A | 1 | 0 | 0 | 0 | 1 | 0 | A | 0 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| *C. arnoldii* ssp. *obliterata* 2 | 0 | N | 0 | A | 1 | A | C | 0 | 0 | 0 | 1 | 1 | A | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 1 | 1 | C | 0 | F | A | A | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 |
| *C. arnoldii* ssp. *obliterata* 3 | 0 | A | 0 | 1 | D | 0 | 2 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | A | 1 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | H | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| *C. arnoldii* ssp. *obliterata* 4 | 0 | A | 0 | 1 | R | 0 | 2 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | A | 1 | 0 | 1 | 0 | 1 | 0 | A | 0 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 1 |
| *C. arnoldii* ssp. *obliterata* 5 | 0 | A | 0 | A | A | 0 | 2 | 0 | 0 | 0 | 1 | 0 | A | A | 1 | A | 2 | 0 | 0 | 0 | 1 | 1 | A | 0 | P | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 |
| *C. arnoldii* ssp. *obliterata* 6 | 0 | A | 0 | 1 | R | 0 | 2 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | A | 1 | 0 | 1 | 0 | 1 | 0 | A | 0 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 1 |
| *C. arnoldii* ssp. *obliterata* 7 | 0 | A | 0 | 1 | A | A | 2 | 0 | 0 | 0 | 1 | 0 | 0 | A | 1 | A | 1 | 0 | 0 | 0 | 1 | 0 | A | A | P | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 |
| *C. arnoldii* ssp. *obliterata* 8 | 0 | A | 0 | 1 | 5 | 0 | 2 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | A | 1 | 0 | 0 | 0 | 1 | 0 | A | 0 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| *C. arnoldii* ssp. *obliterata* 9 | 0 | N | 0 | 1 | Q | 1 | 2 | 0 | 0 | 0 | 1 | 1 | 0 | 1 | A | 1 | 1 | 0 | 0 | 0 | 1 | A | 1 | 1 | 3 | A | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | W |
| *C. arnoldii* ssp. *obliterata* 10 | 0 | N | 0 | A | C | 0 | 2 | 0 | 0 | 0 | 1 | 1 | A | 1 | 1 | 1 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 3 | A | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 2 |
| *C. arnoldii* ssp. *obliterata* 11 | 0 | N | 0 | 1 | U | 1 | C | 0 | 0 | 0 | 1 | 1 | 0 | 1 | A | 1 | 2 | 0 | 0 | 0 | 1 | 0 | C | 1 | H | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 1 | W |
| *C. arnoldiiconfusa* 1 | 0 | 1 | 0 | 1 | 4 | 0 | 1 | 0 | 0 | 0 | 1 | A | 0 | 1 | A | 1 | 2 | 0 | 0 | 0 | 1 | 0 | A | 0 | 5 | 0 | A | 1 | 0 | 1 | 2 | 0 | 0 | 1 | 1 | 0 | 0 | 0 |
| *C. arnoldiiconfusa* 2 | 0 | 1 | 0 | 1 | 4 | 0 | 1 | 0 | 0 | 0 | 1 | A | 0 | 1 | A | 1 | 2 | 0 | 0 | 0 | 1 | 0 | A | 0 | 5 | 0 | A | 0 | 0 | 1 | 1 | 0 | 0 | 1 | 1 | 0 | 0 | 0 |
| *C. arnoldiiconfusa* 3 | 0 | 1 | 0 | 1 | 4 | A | 1 | 0 | 0 | 0 | 1 | A | 0 | 1 | A | 1 | 2 | 0 | 0 | 0 | 1 | 0 | A | A | 5 | 0 | A | 0 | 0 | 1 | 1 | 0 | 0 | 1 | 1 | 0 | 0 | 0 |
| *C. arnoldiiconfusa* 4 | 0 | 1 | 0 | 1 | 4 | 0 | 1 | 0 | 0 | 0 | 1 | A | 0 | 1 | A | 1 | 2 | 0 | 1 | 0 | 1 | 0 | A | 0 | 5 | 0 | A | 1 | 0 | 1 | 2 | 0 | 1 | 2 | 1 | 0 | 0 | 0 |
| *C. arnoldiiconfusa* 5 | 0 | 1 | 0 | 1 | 4 | 0 | 1 | 0 | 0 | 0 | 1 | A | 0 | 1 | A | 1 | 2 | 0 | 0 | 0 | 1 | 0 | A | 0 | 5 | 0 | A | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 1 | 0 | 0 | 0 |
| *C. arnoldiiconfusa* 6 | 0 | 1 | 0 | 1 | 4 | A | 1 | 0 | 0 | 0 | 1 | A | 0 | 1 | A | 1 | 2 | 0 | 0 | 0 | 1 | 0 | A | A | 5 | 0 | A | 0 | 0 | 1 | 1 | 0 | 1 | 2 | 1 | 0 | 0 | 0 |
| *C. biatorina* 1 | 0 | A | 1 | 1 | G | 0 | C | 0 | 0 | 0 | 1 | 1 | 0 | A | 1 | A | C | 1 | 1 | 0 | 1 | B | A | 0 | J | A | B | 1 | 0 | 2 | 3 | 0 | 1 | 3 | 0 | 0 | 2 | 1 |
| *C. biatorina* 2 | 0 | 1 | 1 | 1 | G | 0 | C | 0 | 0 | 0 | 1 | A | 0 | A | 1 | A | C | 1 | 1 | 0 | 1 | B | A | 0 | S | A | B | 1 | 0 | 2 | 3 | 0 | 1 | 3 | 0 | 0 | 2 | 0 |
| *C. biatorina* 3 | 0 | A | 1 | 1 | G | 0 | C | 0 | 0 | 0 | 1 | A | 0 | A | 1 | A | C | 1 | 1 | 0 | 1 | B | A | 0 | J | A | B | 1 | 0 | 2 | 3 | 0 | 1 | 3 | 0 | 0 | 2 | 0 |
| *C. biatorina* 4 | 0 | 1 | 1 | 1 | G | 0 | C | 0 | 0 | 0 | 1 | A | 0 | A | 1 | A | C | 1 | 1 | 0 | 1 | B | A | 0 | S | A | B | 1 | 0 | 2 | 2 | 0 | 1 | 3 | 0 | 0 | 2 | 1 |
| *C. biatorina* 5 | 0 | 1 | 1 | 1 | G | 0 | F | 0 | 0 | 0 | 1 | A | 0 | A | 1 | A | C | 1 | 2 | 0 | 1 | 2 | A | 0 | S | A | B | 1 | 1 | 2 | 3 | 0 | 1 | 3 | 1 | 0 | 2 | 0 |
| *C. biatorina* 6 | 0 | 1 | 1 | 1 | G | 0 | C | 0 | 0 | 0 | 1 | A | 0 | A | 1 | A | C | 1 | 1 | 0 | 1 | B | A | 0 | J | A | 0 | 1 | 0 | 2 | 3 | 0 | 1 | 3 | 0 | 0 | 2 | 0 |
| *C. biatorina* 7 | 0 | 1 | 1 | 1 | C | 1 | C | 0 | 0 | 0 | 1 | A | 0 | A | 1 | A | C | 1 | 2 | 0 | 1 | B | A | 1 | J | A | N | 1 | 0 | 2 | 3 | 0 | 1 | 3 | 0 | 0 | 2 | 0 |
| *C. biatorina* 8 | 0 | 1 | 1 | 1 | G | 0 | C | 0 | 0 | 0 | 1 | A | 0 | A | 1 | A | C | 1 | 2 | 0 | 1 | B | A | 0 | S | A | B | 1 | 0 | 2 | 3 | 0 | 1 | 3 | 0 | 0 | 1 | 0 |

| | | | | |
|---|---|---|---|---|
| *C. biatorina* 9 | 0 1 1 1 G 0 C 0 0 0 | 1 A 0 A 1 A C 1 2 0 | 1 2 A 0 S A B 1 0 2 | 3 0 1 3 0 0 2 0 |
| *C. decipiens* 1 | 0 A 1 A 6 1 3 0 0 0 | A 1 0 C 1 1 C 1 2 1 | 0 ? ? ? ? ? ? ? ? ? | ? ? ? ? ? ? ? ? 0 |
| *C. decipiens* 2 | 0 A 1 A E 1 3 0 0 0 | A 1 0 C 1 1 C 1 2 1 | 0 ? ? ? ? ? ? ? ? ? | ? ? ? ? ? ? ? ? 0 |
| *C. ignea* 1 | 0 0 1 1 G 0 0 0 0 0 | A 1 0 0 A A 1 1 1 0 | 1 2 A 0 M 0 0 1 0 1 | 2 0 0 1 0 0 1 2 |
| *C. pusilla* 1 | 0 0 0 1 L 1 C 0 0 0 | 1 A 0 A 1 1 C 0 0 0 | 1 B 1 1 K A A 1 0 1 | 2 0 0 2 1 0 0 0 |
| *C. pusilla* 2 | 0 0 1 1 6 1 C 0 0 0 | 1 A 0 A 1 1 C 0 2 0 | 1 B 1 1 K A A 1 1 1 | 2 0 0 2 1 0 0 0 |
| *C. pusilla* 3 | 0 0 0 1 6 1 C 0 0 0 | 1 A 0 A 1 1 C 0 2 0 | 1 B 1 1 K A A 0 0 1 | 2 0 1 1 1 0 1 0 |
| *C. pusilla* 4 | 0 A 1 1 6 1 C 0 0 0 | 1 A 0 A 1 1 C 0 1 0 | 1 B 1 1 K A A 1 0 1 | 2 0 1 2 1 0 0 0 |
| *C. pusilla* 5 | 0 0 1 1 6 1 C 0 0 0 | 1 A 0 A 1 1 C 0 2 0 | 1 B 1 1 K A A 1 0 1 | 3 0 1 2 1 0 0 0 |
| *C. pusilla* 6 | 0 1 1 1 6 1 C 0 0 0 | 1 A 0 A A 1 C 0 1 0 | 1 B 1 1 K A A 1 0 1 | 2 0 1 2 1 0 0 0 |
| *C. rouxii* 1 | 0 1 0 1 4 0 3 1 0 0 | 1 A 0 2 A 1 A 0 1 0 | 1 2 1 0 M A N 1 1 1 | 1 1 1 1 1 1 0 0 |
| *C. rouxii* 2 | 0 1 0 1 J 0 3 1 0 0 | 1 A 0 2 A 1 A 0 0 0 | 1 N 1 0 M A N 1 1 1 | 1 1 1 0 1 1 0 0 |
| *C. rouxii* 3 | 0 1 0 1 4 0 3 1 0 0 | 1 A 0 2 0 1 A 0 0 0 | 1 2 1 0 M A N 1 1 1 | 1 1 1 1 1 1 0 0 |
| *C. saxicola s. str.* 1 | 0 2 0 1 P 0 P 0 0 0 | 0 ? 0 2 0 1 0 0 1 0 | 1 N 2 0 T 1 1 1 1 2 | 2 0 1 2 1 0 1 0 |
| *C. saxicola s. str.* 2 | 0 2 0 1 P 0 P 0 0 0 | 0 ? 0 2 0 1 0 0 0 0 | 1 0 2 0 T 1 1 1 0 2 | 2 0 1 1 1 1 1 W |
| *C. saxicola s. str.* 3 | 0 2 0 1 C 0 P 0 0 0 | 0 ? 0 2 0 1 0 0 0 0 | 1 N 2 0 T 1 1 1 1 1 | 2 0 1 1 0 1 1 2 |
| *C. saxicola s. str.* 4 | 0 2 0 1 C 0 P 0 0 0 | A 1 0 2 0 1 0 0 0 0 | 1 N 2 A F 1 1 1 0 1 | 2 0 1 1 1 1 1 0 |
| *C. saxicola s. str.* 5 | 0 2 0 1 C 0 P 0 0 0 | 0 ? 0 2 0 1 A 0 2 0 | 1 N 2 0 F 1 1 1 1 2 | 2 0 1 1 0 1 2 0 |
| *C. saxicola s. str.* 6 | 0 2 0 1 C 0 P 0 0 0 | 0 ? 0 2 0 1 A 0 1 0 | 1 N 2 0 F 1 1 1 1 2 | 2 0 1 1 1 1 1 0 |
| *C. saxicola s. str.* 7 | 0 2 0 1 C 0 P 0 0 0 | 0 ? 0 2 0 1 A 0 1 0 | 1 N 2 0 F 1 1 1 1 2 | 2 0 1 1 0 1 2 0 |
| *C. saxicola s. str.* 8 | 0 B 0 1 C A P 0 0 0 | 0 ? 0 2 0 1 A 0 1 0 | 1 A N A F 1 A 1 0 1 | 2 0 1 1 1 0 1 0 |
| *C. saxicola s. str.* 9 | 0 2 0 1 P A 1 0 0 0 | 0 ? 0 2 0 1 A 0 0 0 | 1 0 2 A T 1 A 1 0 1 | 2 0 0 1 0 0 1 0 |
| *C. saxicola s. str.* 10 | 0 2 0 1 P 0 P 0 0 0 | 0 ? 0 2 0 1 0 0 0 0 | 1 N 2 0 T 1 1 1 0 2 | 0 0 1 0 0 1 1 W |
| *C. schistidii* 1 | 3 0 1 W 1 0 2 0 0 0 | 0 ? 0 0 W 0 0 0 1 0 | 1 2 0 0 3 0 0 1 1 2 | 3 0 1 1 0 1 3 3 |
| *X. candelaria* | 2 0 1 0 O 0 P 0 1 1 | 0 ? 1 0 W 0 2 0 1 1 | 0 ? ? ? ? ? ? ? ? ? | ? 0 ? ? ? ? ? 1 |
| *X. elegans* | 1 1 1 0 3 0 3 1 1 1 | 0 ? 1 2 0 0 2 1 2 0 | 1 A C 0 I A 0 1 0 1 | 2 0 0 2 1 0 1 0 |
| *X. sorediata* 1 | 1 1 1 0 O 0 F 0 1 1 | 0 ? 1 0 W 0 2 1 2 1 | 0 ? ? ? ? ? ? ? ? ? | ? 0 ? ? ? ? ? 0 |

SUPPLEMENTARY TABLE III.

Parameter estimates from the B2 analysis. The posterior distribution for each parameter is summarized in terms of the posterior median and a 95% credible interval. The substitution rate $\mu^{1,3}$ for the ITS spacers (partitions 1 and 3) was about 13.9 times higher than the substitution rate $\mu^{2}$ for the 5S rRNA itself. The ratio $\lambda$ between the indel rate and the substitution rate for the ITS spacers was about 0.1004. The mean length of insertions/deletions was about 1.2, indicating that most insertions and deletions affected only a single nucleotide.

| Parameter | Median | CI |
|---|---|---|
| $\mu^{1,3}$ | 0.008337 | (0.006327, 0.01118) |
| $\mu^{2}$ | 0.000598 | (0.000305, 0.001059) |
| $q^{1}$ | 0.4488 | (0.1417, 0.6382) |
| $q^{2}$ | 0.2660 | (0.06290, 0.5173) |
| $q^{3}$ | 0.3076 | (0.07184, 0.4866) |
| $r^{1}$ | 0.05390 | (0.01454, 0.1079) |
| $r^{2}$ | 0.2527 | (0.09357, 0.4520) |
| $r^{3}$ | 0.698 | (0.4957, 0.847) |
| $\kappa^{1,3}{}_{AG}$ | 2.347 | (1.852, 3.192) |
| $\kappa^{1,3}{}_{TC}$ | 4.986 | (3.857, 6.473) |
| $f^{1,3}$ | 0.1211 | (0.004795, 0.4942) |
| $\pi^{1,3}{}_{A}$ | 0.1653 | (0.1366, 0.1974) |
| $\pi^{1,3}{}_{G}$ | 0.3002 | (0.2618, 0.3406) |
| $\pi^{1,3}{}_{T}$ | 0.2148 | (0.1838, 0.2480) |
| $\pi^{1,3}{}_{C}$ | 0.3183 | (0.2818, 0.3568) |
| $\kappa^{2}{}_{AG}$ | 1.903 | (1.032, 2.816) |
| $\kappa^{2}{}_{TC}$ | 3.049 | (1.799, 8.381) |
| $f^{2}$ | 0.4708 | (0.02151, 0.974) |
| $\pi^{2}{}_{A}$ | 0.2553 | (0.1928, 0.326) |
| $\pi^{2}{}_{G}$ | 0.2557 | (0.1928, 0.326) |
| $\pi^{2}{}_{T}$ | 0.2524 | (0.1902, 0.3222) |
| $\pi^{2}{}_{C}$ | 0.2327 | (0.1735, 0.3003) |
| $\log \lambda$ | -2.299 | (-2.596, -2.01) |
| $\log \varepsilon$ | -1.792 | (-2.365, -1.357) |