

Supplementary material

Molecular phylogeny of the orb-weaving spider genus *Leucauge* and the intergeneric relationships of Leucauginae (Araneae, Tetragnathidae)

Jesús A. Ballesteros^{A,B,C} and *Gustavo Hormiga*^A

^ADepartment of Biological Sciences, The George Washington University, Washington, DC 20052, USA.

Email: hormiga@gwu.edu

^BDepartment of Integrative Biology, University of Wisconsin—Madison, Madison, WI 53706, USA.

^CCorresponding author. Email: ballesterosc@wisc.edu

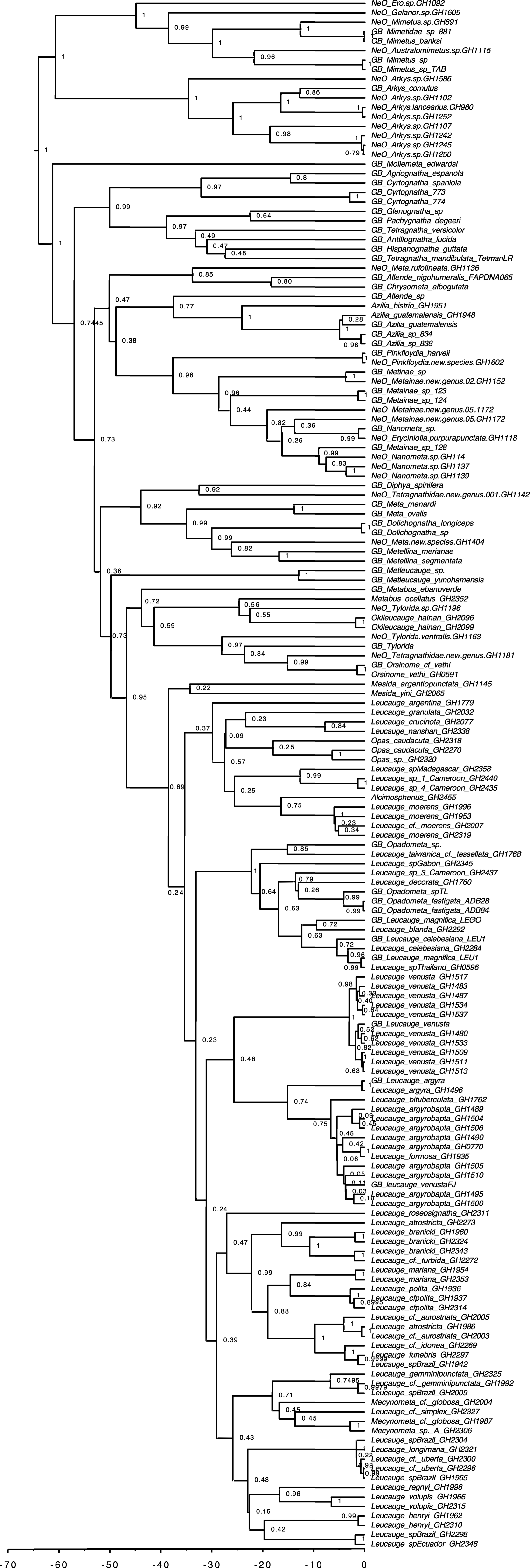


Fig. S1. Maximum clade credibility tree (BI) from the full dataset.

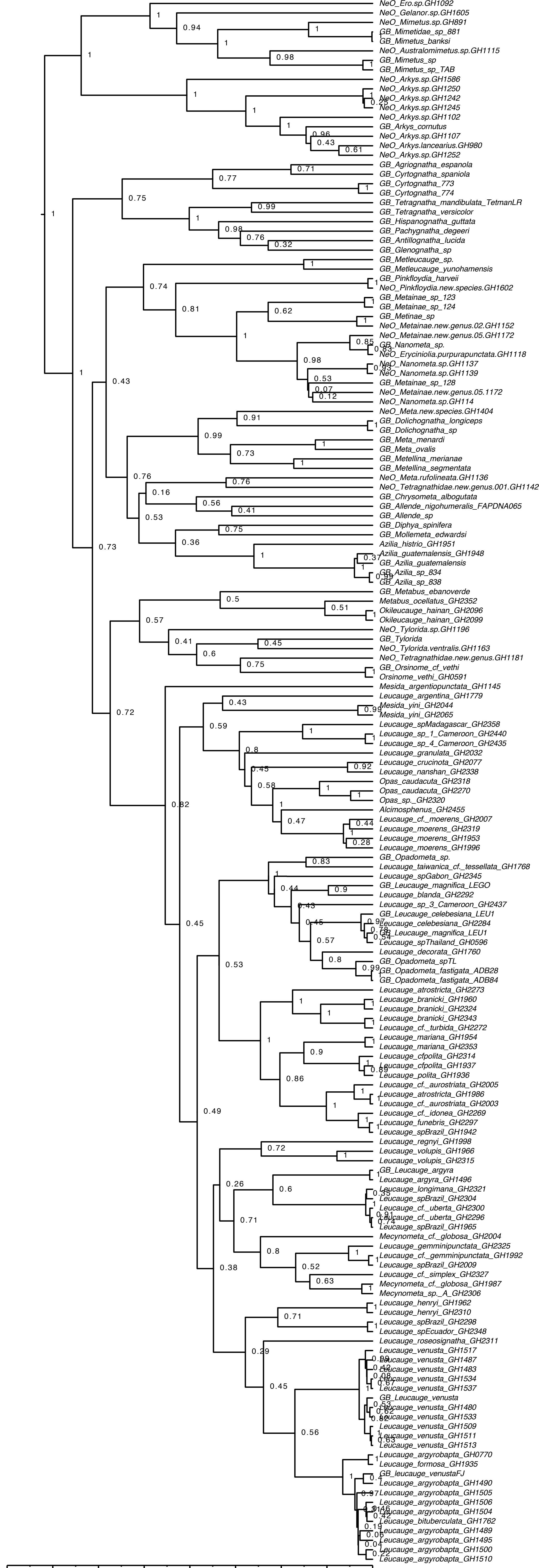
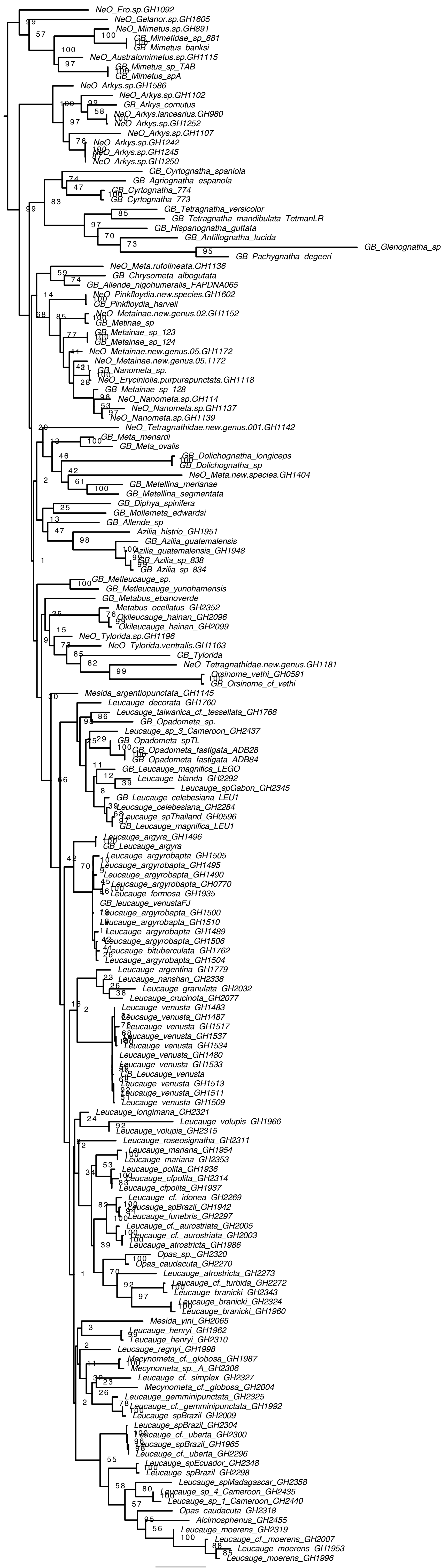
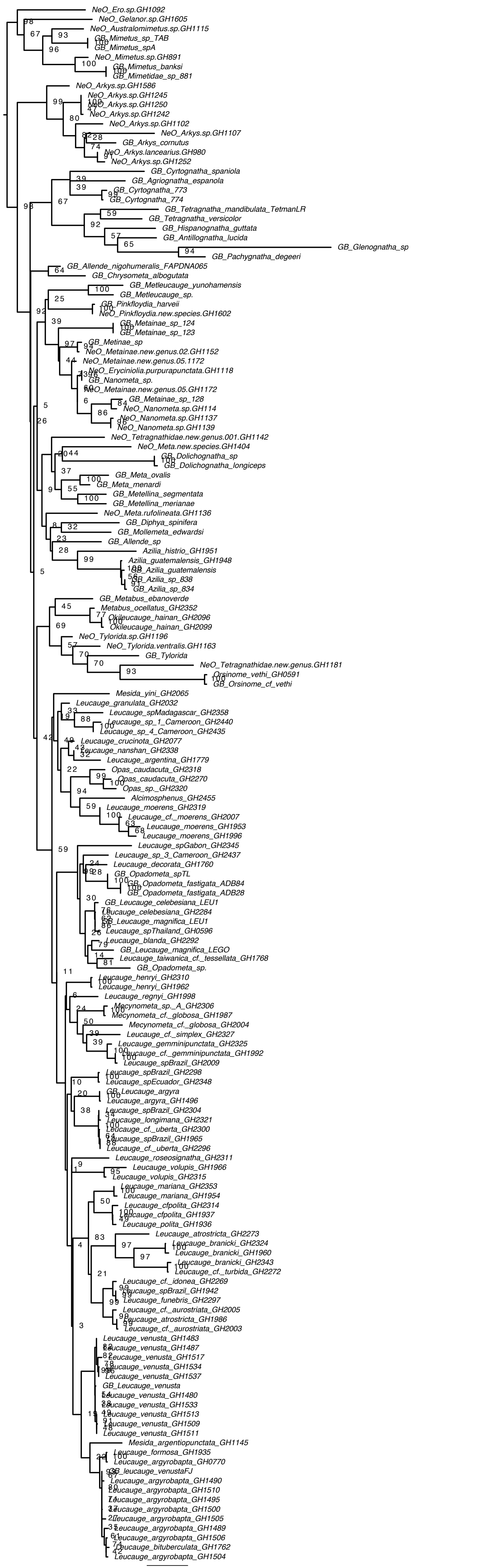


Fig. S2. Maximum clade credibility tree (BI) from the condensed dataset.



0.07

Fig. S3. Maximum likelihood tree from the full dataset.



0.05

Fig. S4. Maximum likelihood tree from the condensed dataset.

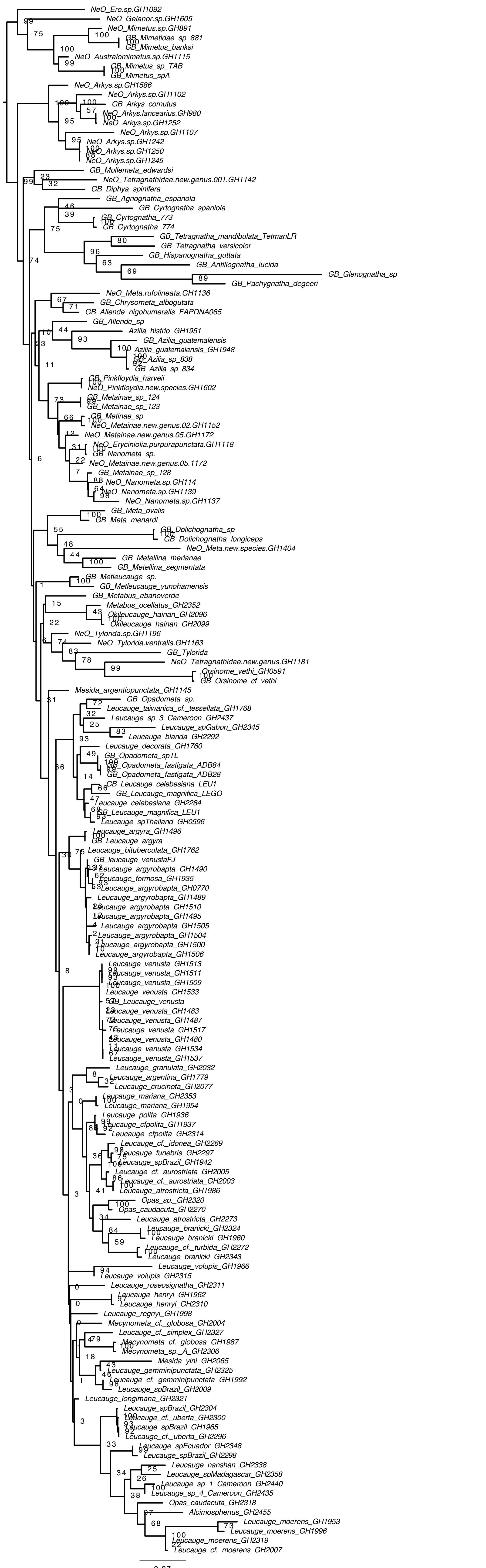


Fig. S5. Maximum likelihood tree from the full dataset using RY coding for composition biased positions based on χ^2 test.

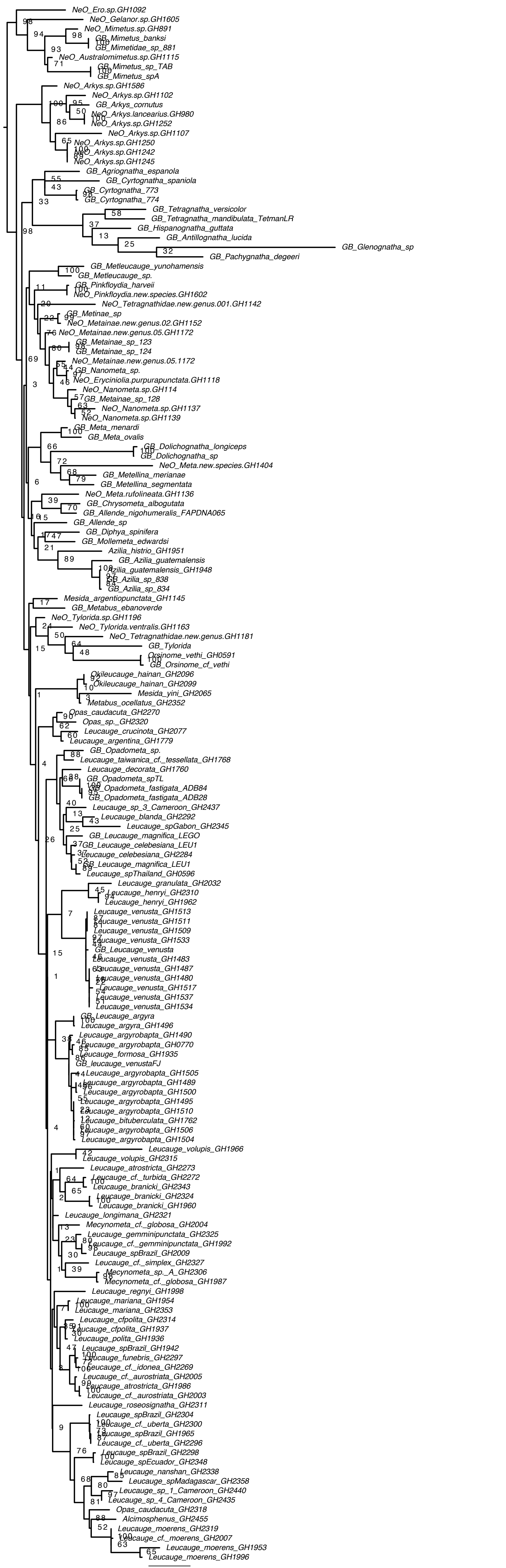


Fig. S6. Maximum likelihood tree from the full dataset with biased positions RY based on p4 test.

Table S1. Specimen collection metadata

Voucher	Species	Date	Country: state	Locality name	Longitude	Latitude
GH2455	<i>Alicimosphenus licinus</i>		Dominican Republic	NA	NA	NA
GH1948	<i>Azilia guatemalensis</i>	09-Aug-13	Costa Rica: Puntarenas	Estacion Biologica Monteverde, Sendero Principal (bridge)	-84.8079	10.3198
GH1951	<i>Azilia histrio</i>	25-May-12	Brazil: Roraima	Trail leading E. of Caicubi community	-62.0866	-1.02925
GH1779	<i>Leucauge argentina</i>	28-Apr-11	Singapore:	Bukit Timah Nat. Res.	1.35472	103.777
GH1496	<i>Leucauge argyra</i>	07-Jul-14	USA: Florida	Archbold Biological Station	-81.3504	27.1818
GH0770	<i>Leucauge argyrobapta</i>	21-Aug-07	Brazil: Rio de Janeiro	Jardin Botanico, Museu Nacional do Rio de Janeiro	-43.2235	-22.9084
GH1489	<i>Leucauge venusta</i>	06-Jul-14	USA: Georgia	Near Jekyll Island	-81.4155	31.1145
GH1490	<i>Leucauge venusta</i>	06-Jul-14	USA: Florida	Near Osceola National Forest	-82.4417	30.2468
GH1495	<i>Leucauge venusta</i>	07-Jul-14	USA: Florida	Archbold Biological Station	-81.3504	27.1818
GH1500	<i>Leucauge venusta</i>	08-Jul-14	USA: Florida	Lake Annie, Archbold Biological Station	-81.3491	27.2106
GH1504	<i>Leucauge venusta</i>	09-Jul-14	USA: Florida	Near Goethe State Park	-82.6331	29.1805
GH1505	<i>Leucauge venusta</i>	09-Jul-14	USA: Florida	Otter Springs Campground	-82.9415	29.6453
GH1506	<i>Leucauge venusta</i>	10-Jul-14	USA: Florida	Near Ecofina River State Park	-83.9065	30.059
GH1510	<i>Leucauge venusta</i>	11-Jul-14	USA: Louisiana	Near Tickfaw State Park	-90.637	30.3838
GH1986	<i>Leucauge atrostricta</i>	14-Apr-12	Brazil: Para	Fazenda Bom Retiro	-49.238	-4.84498
GH2273	<i>Leucauge atrostricta</i>	29-Oct-14	Brazil: Para	FLONA Tapajos, km 83	-54.9418	3.043
GH1762	<i>Leucauge bituberculata</i>	23-Mar-09	Ecuador: Galapagos	El Junco, Isla San Cristobal	-89.4813	-0.895278
GH2292	<i>Leucauge blanda</i>	10-Jul-13	Taiwan:	Dasyueshan National Forest, Recreation Area	121.007	24.2574
GH1960	<i>Leucauge branicki</i>	11-Aug-11	Brazil: Para	Mirinzal	-44.8285	-2.12743
GH2324	<i>Leucauge branicki</i>	18-May-12	Brazil: Amazonas	Reserva Florestal Adolfo Ducke	-59.9733	-2.93216
GH2343	<i>Leucauge branicki</i>	12-Dec-09	Ecuador: Napo	Fundacion Jatun Sacha	-77.6167	-1.06597
GH2284	<i>Leucauge celebesiana</i>	07-Jul-13	Taiwan:	Luhu, near Nanzhuang Township	121.047	24.5407
GH2003	<i>Leucauge cf. aurostriata</i>	04-Nov-14	Brazil: Para	Parque Estadual do Utinga	-48.4293	-1.42308
GH2005	<i>Leucauge cf. aurostriata</i>	16-Jul-14	Mexico: Veracruz-Llave	Estacion de Biologia Los Tuxtlas	-95.0742	18.5854
GH1992	<i>Leucauge cf. gemminipunctata</i>	14-Mar-12	Brazil: Maranhao	Reserva Biologica Gurupi (Norte)	-46.7463	-3.69273
GH2269	<i>Leucauge cf. idonea</i>	17-Jun-14	Brazil: Roraima	Vila Tepequem, Cachoeira Paiva	-61.7164	3.75511
GH2007	<i>Leucauge cf. moerens</i>	15-Jun-14	Brazil: Roraima	Vila Tepequem, Pousada PSJ	-61.7219	3.78206
GH2327	<i>Leucauge cf. simplex</i>	18-May-12	Brazil: Amazonas	Reserva Florestal Adolfo Ducke	-59.9733	-2.93216
GH2272	<i>Leucauge cf. turbida</i>	04-Nov-14	Brazil: Para	Parque Estadual do Utinga	-48.4293	-1.42308
GH2296	<i>Leucauge cf. uberta</i>	18-May-12	Brazil: Amazonas	Reserva Florestal Adolfo Ducke	-59.9733	-2.93216
GH2300	<i>Leucauge cf. uberta</i>	27-May-12	Brazil: Roraima	Bacaba, Comunidad de Caicubi	-62.1031	-0.977952
GH1937	<i>Leucauge sp.</i>	26-Aug-12	Mexico: Distrito Federal	Bosque de Tlalpan	-99.1949	19.2955
GH2314	<i>Leucauge venusta</i>	12-Oct-12	Mexico: Veracruz-Llave	Trail to plot II, Pico de Orizaba Volcano. Atotonilco de Calchualco	-97.2071	19.1419
GH2077	<i>Leucauge crucinota</i>	13-Oct-09	Vietnam: Ninh Binh	Cuc Phuong National Park, Cay Dang Co Thu trail	105.656	20.299
GH1760	<i>Leucauge decorata</i>	07-Jul-13	Taiwan:	Luhu, near Nanzhuang Township	121.047	24.5407
GH1935	<i>Leucauge argyrobapta</i>	23-Jan-14	Brazil: Rio de Janeiro	Pista Claudio Coutinho	-43.1588	-22.9498
GH2297	<i>Leucauge funebris</i>	18-May-12	Brazil: Amazonas	Reserva Florestal Adolfo Ducke	-59.9733	-2.93216
GH2325	<i>Leucauge gemminipunctata</i>	25-May-12	Brazil: Roraima	Trail leading E. of Caicubi community	-62.0866	-1.02925
GH2032	<i>Leucauge granulata</i>	08-Feb-12	Australia: Queensland	Land Rd, Rose Gums Wilderness Retreat ~13 km N.E. of Malanda ridge trail	145.703	17.3141
GH1962	<i>Leucauge henryi</i>	31-Oct-10	Brazil: Para	Parque Estadual do Utinga	-48.4293	-1.42308
GH2310	<i>Leucauge henryi</i>	18-May-12	Brazil: Amazonas	Reserva Florestal Adolfo Ducke	-59.9733	-2.93216
GH2321	<i>Leucauge longimana</i>	18-May-12	Brazil: Amazonas	Reserva Florestal Adolfo Ducke	-59.9733	-2.93216
GH1954	<i>Leucauge mariana</i>	08-Aug-13	Costa Rica: Heredia	INBIO parque	-84.0928	9.97303
GH2353	<i>Leucauge mariana</i>	01-Aug-2013	Costa Rica: Puntarenas	University of Georgia	-84.7986	10.2819
GH1953	<i>Leucauge moerens</i>	01-Aug-2013	Costa Rica: Heredia	La Selva Biological Station, near Puerto Viejo	-84	10.4306
GH1996	<i>Leucauge moerens</i>	10-Sep-14	Panama: Chiriqui	David	-82.4974	8.43772
GH2319	<i>Leucauge moerens</i>	31-May-12	Brazil: Roraima	Tucano, Arquipelago de Mariui e Baixo Rio Branco, Rio Jufari Comunidad de Caicubi	-62.1058	-1.01484
GH2338	<i>Leucauge nanshan</i>	27-Sep-09	Vietnam: Ha Tinh	Vu Quang National Park, forest near Don Bien Phong (border station) 567)	105.439	18.3313

Voucher	Species	Date	Country: state	Locality name	Longitude	Latitude
GH1936	<i>Leucauge polita</i>	19-Sep-12	Mexico: Mexico	Acueducto Vista del Valle # 38, CP 53296	-99.2659	19.4738
GH1998	<i>Leucauge regnyi</i>	16-Apr-15	Dominican Republic: La Vega	Reserva Cientifica Ebano Verde	-70.5419	19.0324
GH2311	<i>Leucauge roseosignatha</i>	23-Jan-12	Brazil: Bahia	Parque Estadual Sete Passagens, Miguel Calmon	-40.5221	-11.3998
GH1942	<i>Leucauge</i> sp.	29-May-12	Brazil: Roraima	Trail leading E. of Caicubi community	-62.0898	-1.0285
GH1965	<i>Leucauge</i> sp.	19-Feb-11	Brazil: Para	Acampamento Mutum	-56.2229	-2.555
GH2009	<i>Leucauge</i> sp.	29-Oct-14	Brazil: Para	FLONA Tapajos, km 83	-54.9418	3.043
GH2298	<i>Leucauge</i> sp.	18-May-12	Brazil: Amazonas	Reserva Florestal Adolfo Ducke	-59.9733	-2.93216
GH2304	<i>Leucauge</i> sp.	28-May-12	Brazil: Roraima	Pupunha, Comunidad de Caicubi	-62.0974	-0.988992
GH2348	<i>Leucauge</i> sp.	12-Dec-09	Ecuador: Napo	Fundacion Jatun Sacha	-77.6167	-1.06597
GH2345	<i>Leucauge</i> sp.	28-Jun-09	Gabon: Moyen-Ogooue	Lambarene	10.1992	-0.65825
GH2358	<i>Leucauge</i> sp.	22-Jan-03	Madagascar: Fianarantsoa	Foret d'Antsirakambiaty	46.564	-20.594
GH0596	<i>Leucauge</i> sp.	02-Oct-03	Thailand: Chiang Mai	Amphen Chiangdao, below guest house along road	98.8297	19.3203
GH2440	<i>Leucauge</i> sp. 1 Cameroon	14-Jun-09	Cameroon: South-west Region	Mount Cameroon, Buea, track from prison farm	9.21822	4.17018
GH2437	<i>Leucauge</i> sp. 3 Cameroon	13-Jun-09	Cameroon: South-west Region	Mount Cameroon, Track to Ekona Lelu	9.31117	4.26873
GH2435	<i>Leucauge</i> sp. 4 Cameroon	14-Jun-09	Cameroon: South-west Region	Mount Cameroon, Buea, track from prison farm	9.21822	4.17018
GH1768	<i>Leucauge taiwanica</i> cf. <i>tessellata</i>	29-Jul-13	Taiwan:	Li-Lung Mountain, N. of Dungyuan Township, off County Road 199	120.855	22.2406
GH1480	<i>Leucauge venusta</i>	02-Jul-14	USA: Virginia	Moonshine Dell Trails, Mountain Lake Biological Station	-80.5186	37.3727
GH1483	<i>Leucauge venusta</i>	03-Jul-14	USA: North Carolina	Near Arrowhead Campground, Uwharrie National Forest	-80.0713	35.4396
GH1487	<i>Leucauge venusta</i>	05-Jul-14	USA: Georgia	Near Magnolia Springs, State Park	-81.9531	32.8853
GH1509	<i>Leucauge venusta</i>	11-Jul-14	USA: Alabama	Near Little River State Park	-87.4853	31.2402
GH1511	<i>Leucauge venusta</i>	12-Jul-14	USA: Louisiana	Near Three Rivers Wildlife Management Area	-91.6461	31.0099
GH1513	<i>Leucauge venusta</i>	12-Jul-14	USA: Mississippi	Near St Catherine Creek National Wildlife Refuge	-91.4514	31.4073
GH1517	<i>Leucauge venusta</i>	13-Jul-14	USA: Arkansas	Poison Creek	-93.0053	33.6391
GH1533	<i>Leucauge venusta</i>	18-Jul-14	USA: Ohio	Near Shawnee State Park	-83.1802	38.7268
GH1534	<i>Leucauge venusta</i>	19-Jul-14	USA: Ohio	Hanging Rock Recreation Area	-82.7133	38.5732
GH1537	<i>Leucauge venusta</i>	19-Jul-14	USA: West Virginia	Near Cedar Creek State Park	-80.8707	38.8769
GH1966	<i>Leucauge volupis</i>	25-Feb-11	Brazil: Para	Varzea Piranha	-56.1224	-2.21003
GH2315	<i>Leucauge volupis</i>	02-Nov-12	Brazil: São Paulo	Botucatu, Rio Bonito	-48.6658	-22.6779
GH1987	<i>Mecynometa</i> cf. <i>globosa</i>	31-Oct-10	Brazil: Para	Parque Estadual do Utinga	-48.4293	-1.42308
GH2004	<i>Mecynometa</i> cf. <i>globosa</i>	04-Nov-14	Brazil: Para	Parque Estadual do Utinga	-48.4293	-1.42308
GH2306	<i>Mecynometa</i> sp. A	18-May-12	Brazil: Amazonas	Reserva Florestal Adolfo Ducke	-59.9733	-2.93216
GH1145	<i>Mesida argentiopunctata</i>	09-Feb-12	Australia: Queensland	Crater Lakes National Park, Lake Barrine, Rainforest Walk Trail	145.642	-17.2449
GH2065	<i>Mesida yini</i>	13-Oct-09	Vietnam: Ninh Binh	Cuc Phuong National Park, Cay Dang Co Thu trail	105.656	20.299
GH2352	<i>Metabus ocellatus</i>	11-Aug-13	Costa Rica: Puntarenas	Estacion Biologica Monteverde, sendero Congo	-84.8083	10.3157
GH2096	<i>Okileucauge hainan</i>	27-Sep-09	Vietnam: Ha Tinh	Vu Quang National Park, forest near Don Bien Phong (border station) 567)	105.439	18.3313
GH2099	<i>Okileucauge hainan</i>	27-Sep-09	Vietnam: Ha Tinh	Vu Quang National Park, forest near Don Bien Phong (border station) 567)	105.439	18.3313
GH2270	<i>Opas caudacuta</i>	16-Apr-14	Brazil: Roraima	Vils Tepequem, SESC	-61.722	3.782
GH2318	<i>Opas caudacuta</i>	28-May-12	Brazil: Roraima	Pupunha, Comunidad de Caicubi	-62.0974	-0.988992
GH2320	<i>Opas</i> sp.	27-May-12	Brazil: Roraima	Bacaba, Comunidad de Caicubi	-62.1031	-0.977952
GH0591	<i>Orsinome vethi</i>	15-Oct-03	Thailand: Yala	Bang Lang National Park	1.16414	6.19653

Table S2. GenBank accession numbers

Taxon name	16S	18S1	18S2	28S2	28S3	COI	H3	H4	References
GB_Agriognatha_espanola	NA	EU003344	NA	EU153162	EU003402	EU003283	NA	NA	Álvarez-Padilla <i>et al.</i> (2009)
GB_Allende_nigohumeralis_FAPDNA065	EU003271	EU003368	EU003369	EU003396.1	NA	NA	NA	NA	Álvarez-Padilla <i>et al.</i> (2009)
GB_Allende_sp.	NA	GU129574	NA	NA	NA	GU129635	GU129649	NA	Dimitrov and Hormiga (2011)
GB_Antillognatha_lucida	NA	GU129576	GU129577	GU129603	NA	GU129631	GU129647	NA	Dimitrov and Hormiga (2011)
GB_Arkys_cornutus	NA	NA	FJ607482	NA	NA	FJ607556	FJ607595	NA	Blackledge <i>et al.</i> (2009)
GB_Azilia_guatemalensis	EU003262	EU003371	EU003372	EU003399	NA	EU003280	EU003313	NA	Álvarez-Padilla <i>et al.</i> (2009)
GB_Azilia_sp._834	GU129570	GU129581	NA	GU129606	NA	GU129624	GU129641	NA	Dimitrov and Hormiga (2011)
GB_Azilia_sp._838	NA	GU129582	NA	GU129607	NA	GU129625	GU129642	NA	Dimitrov and Hormiga (2011)
GB_Chrysometa_albogutata	NA	EU003389	NA	EU153160	EU003400	NA	EU003314	NA	Álvarez-Padilla <i>et al.</i> (2009)
GB_Cyrtognatha_773	NA	NA	NA	GU129609	NA	GU129630	GU129645	NA	Dimitrov and Hormiga (2011)
GB_Cyrtognatha_774	NA	NA	NA	GU129610	NA	GU129629	GU129646	NA	Dimitrov and Hormiga (2011)
GB_Cyrtognatha_spaniola	NA	EU003344	NA	EU153162	EU003402	NA	NA	NA	Álvarez-Padilla <i>et al.</i> (2009)
GB_Diphya_spinifera	NA	GU129584	GU129585	GU129611	NA	GU129626	GU129643	NA	Dimitrov <i>et al.</i> (2012)
GB_Dolichognatha_longiceps	NA	GU129578	GU129579	GU129604	GU129605	GU129632	GU129648	NA	Dimitrov <i>et al.</i> (2012)
GB_Dolichognatha_sp.	NA	EU003346	NA	EU153165	EU003405	EU003285	EU003317	NA	Álvarez-Padilla <i>et al.</i> (2009)
GB_Glenognatha_sp.	NA	GU129586	NA	GU129612	NA	GU129627	GU129644	NA	Dimitrov and Hormiga (2011)
GB_Hispanognatha_guttata	NA	GU129587	GU129588	GU129613	NA	GU129633	GU129652	NA	Dimitrov and Hormiga (2011)
GB_Leucauge_argyra	EU003264	EU003364	NA	EU003427	NA	EU003291	EU003339	NA	Dimitrov and Hormiga (2011)
GB_Leucauge_celebesiana_LEU1	JN816497.1	JN816719.1	NA	JN816928.1	NA	JN817131.1	NA	NA	K. H. Jang and U. W. Hwang (unpubl. data)
GB_Leucauge_magnifica_LEGO	JN816496	JN816718	NA	JN816927	NA	JN817130	NA	NA	K. H. Jang and U. W. Hwang (unpubl. data)
GB_Leucauge_magnifica_LEU1	HQ441966	HQ441985	NA	NA	NA	HQ441946	NA	NA	Su <i>et al.</i> (2011)
GB_Leucauge_venusta	EU003263	EU003350	NA	EU153169	EU003409	EU003290	EU003322	NA	Álvarez-Padilla <i>et al.</i> (2009)
GB_Meta_menardi	EU003268	EU003353	NA	EU153173	EU003413	EU003295	EU003325	NA	Álvarez-Padilla <i>et al.</i> (2009)
GB_Meta_ovalis	FJ607460	FJ607497	NA	NA	NA	FJ607571	FJ607609	NA	Blackledge <i>et al.</i> (2009)
GB_Metabus_ebanoverde	EU003265	EU003354	NA	EU153174	EU003414	EU003296	EU003326	NA	Álvarez-Padilla <i>et al.</i> (2009)
GB_Metainae_sp._123	NA	GU129591	NA	GU129616	NA	NA	NA	NA	Dimitrov and Hormiga (2011)
GB_Metainae_sp._124	NA	GU129592	GU129593	GU129617	GU129618	NA	NA	NA	Dimitrov and Hormiga (2011)
GB_Metainae_sp._128	NA	GU129595	GU129596	GU129619	GU129620	NA	NA	NA	Dimitrov and Hormiga (2011)
GB_Metellina_merianae	EU003270	EU003356	NA	EU153176	EU003416	EU003298	EU003328	NA	Álvarez-Padilla <i>et al.</i> (2009)
GB_Metellina_segmentata	FJ607461	FJ607498	NA	FJ607536	NA	FJ607572	FJ607610	NA	Blackledge <i>et al.</i> (2009)
GB_Metinae_sp.	EU003272	EU003357	NA	EU153177	EU003417	EU003299	NA	NA	Álvarez-Padilla <i>et al.</i> (2009)
GB_Metleucauge_sp.	NA	GU129599	NA	GU129621	NA	GU129636	NA	NA	Dimitrov and Hormiga (2011)
GB_Metleucauge_yunohamensis	JN816500	JN816722	NA	JN816931	NA	JN817134	NA	NA	K. H. Jang and U. W. Hwang (unpubl. data)
GB_Mimetidae_sp._881	NA	NA	NA	JN010191.1	NA	NA	NA	NA	K. H. Jang and U. W. Hwang (unpubl. data)
GB_Mimetus_banksi	NA	GU129600	NA	GU129622	NA	GU129637	GU129651	NA	Dimitrov and Hormiga (2011)
GB_Mimetus_sp.	FJ607463	FJ607500	NA	FJ607538	NA	FJ607574	FJ607612	NA	Blackledge <i>et al.</i> (2009)
GB_Mimetus_sp._TAB	FJ607463.1	FJ607500.1	NA	FJ607538.1	NA	FJ607574.1	FJ607612	NA	Blackledge <i>et al.</i> (2009)
GB_Mollemeta_edwardsi	EU003269	EU003374	EU003375	EU003419	NA	NA	EU003330	NA	Álvarez-Padilla <i>et al.</i> (2009)
GB_Nanometa_sp.	NA	EU003391	NA	EU153179	EU003420	NA	EU003331	NA	Álvarez-Padilla <i>et al.</i> (2009)
GB_Opadometa_fastigata_ADB28	NA	NA	NA	NA	NA	KT383690	NA	NA	DNA barcoding of spiders from Pune, Maharashtra, India (unpubl. data)
GB_Opadometa_fastigata_ADB84	NA	NA	NA	NA	NA	KT383716	NA	NA	DNA barcoding of spiders from Pune, Maharashtra, India (unpubl. data)
GB_Opadometa_sp.	EU003266	EU003361	NA	EU003423	NA	EU003304	EU003336	NA	Álvarez-Padilla <i>et al.</i> (2009)
GB_Opadometa_sPTL	KC849142.1	KC848955	NA	KC849016	NA	KC849101	KC849057	NA	Kuntner <i>et al.</i> (2013)
GB_Orsinome_cf._vethi	EU003267	EU003362	NA	EU153181	EU003424	EU003305	EU003337	NA	Álvarez-Padilla <i>et al.</i> (2009)
GB_Pachygnatha_degeeri	NA	NA	NA	EU153182	NA	NA	NA	NA	Álvarez-Padilla <i>et al.</i> (2009)

Taxon name	16S	18S1	18S2	28S2	28S3	COI	H3	H4	References
GB_Pinkfloydia_harveii	NA	GU129571	GU129572	GU129601	GU129602	GU129628	GU129640	NA	Dimitrov and Hormiga (2011)
GB_Tetragnatha_mandibulata_TetmanLR	NA	NA	NA	AY231069	NA	NA	NA	NA	Arnedo <i>et al.</i> (2004)
GB_Tetragnatha_versicolor	NA	EU003394	NA	EU153185	EU003429	EU003308	NA	NA	Álvarez-Padilla <i>et al.</i> (2009)
GB_Tylorida	NA	EU003365	NA	EU153186	NA	EU003309	NA	NA	Álvarez-Padilla <i>et al.</i> (2009)
GB_Leucauge_venustaFJ	NA	NA	NA	NA	NA	FJ607568	FJ607606	NA	Blackledge <i>et al.</i> (2009)
NeO_Arkys.lancearius.GH980	KM486279	NA	NA	KM486346	NA	NA	NA	NA	Dimitrov <i>et al.</i> (2017)
NeO_Arkys.sp.GH1102	KM486280	KM486131	NA	KM486347	NA	KM486422	KM486474	NA	Dimitrov <i>et al.</i> (2017)
NeO_Arkys.sp.GH1107	KM486281	NA	NA	KM486348	NA	KM486423	KM486475	NA	Dimitrov <i>et al.</i> (2017)
NeO_Arkys.sp.GH1242	KM486275	KM486127	NA	KM486342	NA	NA	KM486476	NA	Dimitrov <i>et al.</i> (2017)
NeO_Arkys.sp.GH1245	KM486276	KM486128	NA	KM486343	NA	NA	NA	NA	Dimitrov <i>et al.</i> (2017)
NeO_Arkys.sp.GH1250	KM486277	KM486129	NA	KM486344	NA	NA	NA	NA	Dimitrov <i>et al.</i> (2017)
NeO_Arkys.sp.GH1252	KM486282	KM486132	NA	KM486349	NA	KM486424	KM486477	NA	Dimitrov <i>et al.</i> (2017)
NeO_Arkys.sp.GH1586	KM486278	KM486130	NA	KM486345	NA	NA	NA	NA	Dimitrov <i>et al.</i> (2017)
NeO_Australomimetus.sp.GH1115	NA	KP271653	NA	KP271728	NA	KP271798	KP271855	NA	Dimitrov <i>et al.</i> (2017)
NeO_Ero.sp.GH1092	KP271663	KP271663	NA	KP271738	NA	NA	NA	NA	Dimitrov <i>et al.</i> (2017)
NeO_Eryciniolia.purpurapunctata.GH1118	KM486295	KM486146	NA	KM486362	NA	NA	NA	NA	Dimitrov <i>et al.</i> (2017)
NeO_Gelanos.sp.GH1605	NA	KP271678	NA	KP271750	NA	KP271817	KP271881	NA	Dimitrov <i>et al.</i> (2017)
NeO_Meta.new.species.GH1404	NA	KM486172	NA	KM486384	NA	NA	KM486502	NA	Dimitrov <i>et al.</i> (2017)
NeO_Meta.rufolineata.GH1136	KM486316	KM486173	NA	KM486385	NA	KM486456	KM486503	NA	Dimitrov <i>et al.</i> (2017)
NeO_Metainae.new.genus.02.GH1152	KM486314	KM486170	NA	KM486382	NA	NA	KM486501	NA	Dimitrov <i>et al.</i> (2017)
NeO_Metainae.new.genus.05.1172	KM486315	KM486171	NA	KM486383	NA	NA	NA	NA	Dimitrov <i>et al.</i> (2017)
NeO_Metainae.new.genus.05.GH1172	NA	NA	NA	NA	NA	NA	NA	NA	Dimitrov <i>et al.</i> (2017)
NeO_Mimetus.sp.GH891	KP271633	KP271702	NA	KP271774	NA	KP271838	NA	NA	Dimitrov <i>et al.</i> (2017)
NeO_Nanometa.sp.GH1137	KM486317	KM486175	NA	KM486387	NA	KM486458	NA	NA	Dimitrov <i>et al.</i> (2017)
NeO_Nanometa.sp.GH1139	KM486318	KM486176	NA	KM486388	NA	KM486459	NA	NA	Dimitrov <i>et al.</i> (2017)
NeO_Nanometa.sp.GH1114	KM486319	KM486177	NA	KM486389	NA	KM486460	KM486505	NA	Dimitrov <i>et al.</i> (2017)
NeO_Pinkfloydia.new.species.GH1602	KM486328	KM486190	NA	KM486401	NA	NA	KM486515	NA	Dimitrov <i>et al.</i> (2017)
NeO_Tetragnathidae.new.genus.001.GH1142	KM486334	KM486202	NA	KM486412	NA	NA	KM486524	NA	Dimitrov <i>et al.</i> (2017)
NeO_Tetragnathidae.new.genus.GH1181	NA	KM486203	NA	KM486413	NA	NA	NA	NA	Dimitrov <i>et al.</i> (2017)
NeO_Tylorida.sp.GH1196	NA	KM486206	NA	KM486416	NA	NA	NA	NA	Dimitrov <i>et al.</i> (2017)
NeO_Tylorida.ventralis.GH1163	NA	KM486207	NA	KM486417	NA	KM486470	KM486526	NA	Dimitrov <i>et al.</i> (2017)
Alcimosphenus_GH2455	NA	MZ604143		MZ604205	NA	MZ562645	MZ562795	MZ562841	
Azilia_guatemalensis_GH1948	NA	NA	NA	NA	NA	NA	NA	NA	
Azilia_histrio_GH1951	NA	MZ604144	NA	MZ604206	NA	MZ562628	NA	MZ562842	
Leucauge_argentina_GH1779	NA	NA	NA	NA	NA	MZ562647	MZ562796	MZ562843	
Leucauge_argyra_GH1496	NA	NA	MZ604145	NA	NA	MG738495	NA	NA	
Leucauge_argyrobapta_GH0770	NA	MZ604146		MZ64207	NA	MG738517	NA	NA	
Leucauge_argyrobapta_GH1489	NA	NA	MZ604147	NA	NA	MG738556	NA	NA	
Leucauge_argyrobapta_GH1490	NA	NA	MZ604148	NA	NA	MG738539	NA	NA	
Leucauge_argyrobapta_GH1495	NA	NA	MZ604149	NA	NA	MG738543	NA	NA	
Leucauge_argyrobapta_GH1500	NA	NA	MZ604150	NA	NA	MG738544	NA	NA	
Leucauge_argyrobapta_GH1504	NA	NA	MZ604151	NA	NA	MG738547	NA	NA	
Leucauge_argyrobapta_GH1505	NA	NA	MZ604152	NA	NA	MG738548	NA	NA	
Leucauge_argyrobapta_GH1506	NA	NA	MZ604153	NA	NA	MG738549	NA	NA	
Leucauge_argyrobapta_GH1510	NA	NA	MZ604154	NA	NA	MG738560	NA	NA	
Leucauge_atrostricta_GH1986	NA	MZ604155	NA	MZ604208	NA	MZ562622	NA	NA	
Leucauge_atrostricta_GH2273	NA	NA	NA	MZ604209	NA	MZ562642	MZ562797	NA	
Leucauge_bituberculata_GH1762	NA	MZ604156		MZ604210	NA	MZ562624	NA	NA	
Leucauge_blanda_GH2292	NA	MZ604204	NA	MZ604211	NA	MZ562667	MZ562798	MZ562844	
Leucauge_branicki_GH1960	NA	NA	NA	MZ604212	NA	MZ562631	NA	NA	
Leucauge_branicki_GH2324	NA	NA	NA	MZ604213	NA	MZ562632	MZ562799	NA	
Leucauge_branicki_GH2343	NA	NA	MZ604157	NA	NA	MZ562640	MZ562800	NA	
Leucauge_celebesiana_GH2284	NA	NA	NA	MZ604214	NA	MZ562669	MZ562801	MZ562845	
Leucauge_cf._aurostriata_GH2003	NA	MZ604158	NA	MZ604215	NA	MZ562652	NA	NA	

Taxon name	<i>16S</i>	<i>18S1</i>	<i>18S2</i>	<i>28S2</i>	<i>28S3</i>	<i>COI</i>	<i>H3</i>	<i>H4</i>	References
Leucauge_cf_aurostriata_GH2005	NA	NA	NA	MZ604216	NA	MZ562651	MZ562802	MZ562846	
Leucauge_cf_gemminipunctata_GH1992	NA	NA	NA	NA	NA	MZ562653	MZ562803	MZ562847	
Leucauge_cf_idonea_GH2269	NA	MZ604159	NA	MZ604217	NA	MZ562650	MZ562804	MZ562848	
Leucauge_cf_moerens_GH2007	NA	NA	NA	NA	NA	MZ562661	NA	NA	
Leucauge_cf_simplex_GH2327	NA	MZ604160	NA	MZ604218	NA	MZ562639	MZ562805	MZ562849	
Leucauge_cf_turbida_GH2272	NA	MZ604161	NA	MZ604219	NA	MZ562641	MZ562806	MZ562850	
Leucauge_cf_uberta_GH2296	NA	MZ604162	NA	MZ604220	NA	MZ562634	MZ562807	MZ562851	
Leucauge_cf_uberta_GH2300	NA	MZ604163	NA	MZ604221	NA	MZ562623	MZ562808	NA	
Leucauge_cf.polita_GH1937	NA	NA	NA	MZ604222	NA	MG738512	MZ562809	MZ562852	
Leucauge_cf.polita_GH2314	NA	NA	MZ604164	MZ604223	NA	MG738514	NA	MZ562853	
Leucauge_crucinota_GH2077	NA	MZ604165	NA	MZ604224	NA	NA	MZ562810	MZ562854	
Leucauge_decorata_GH1760	NA	MZ604166	NA	MZ604225	NA	MZ562625	NA	NA	
Leucauge_formosa_GH1935	NA	MZ604167		MZ604226	NA	MZ562655	MZ562811	MZ562855	
Leucauge_funebris_GH2297	NA	MZ604168		NA	NA	MZ562648	MZ562812	NA	
Leucauge_gemminipunctata_GH2325	NA	NA	NA	MZ604227	NA	MG738505	MZ562813	MZ562856	
Leucauge_granulata_GH2032	NA	MZ604169	NA	MZ604228	NA	NA	MZ562814	MZ562857	
Leucauge_henryi_GH1962	NA	NA	NA	MZ604229	NA	MG738507	NA	NA	
Leucauge_henryi_GH2310	NA	NA	MZ604170	MZ604230	NA	MG738506	MZ562815	MZ562858	
Leucauge_longimana_GH2321	NA	MZ604171	NA	MZ604231	NA	NA	MZ562816	MZ562859	
Leucauge_mariana_GH1954	NA	NA	NA	NA	NA	NA	NA	NA	
Leucauge_mariana_GH2353	NA	NA	NA	MZ604232	NA	MG738508	MZ562817	MZ562860	
Leucauge_moerens_GH1953	NA	NA	NA	MZ604233	NA	MZ562663	MZ562818	MZ562861	
Leucauge_moerens_GH1996	NA	MZ604172	NA	MZ604234	NA	MZ562664	NA	NA	
Leucauge_moerens_GH2319	NA	MZ604173	NA	MZ604235	NA	MZ562662	MZ562819	NA	
Leucauge_nanshan_GH2338	NA	NA	NA	MZ604236	NA	NA	MZ562820	NA	
Leucauge_polita_GH1936	NA	NA	NA	MZ604237	NA	MG738513	MZ562821	MZ562862	
Leucauge_regnyi_GH1998	NA	MZ604174		MZ604238	NA	MG738515	NA	NA	
Leucauge_roseosignatha_GH2311	NA	NA	NA	MZ604239	NA	MZ562646	MZ562822	MZ562863	
Leucauge_sp.Brazil_GH1942	NA	NA	NA	MZ604240	NA	MZ562649	MZ562823	MZ562864	
Leucauge_sp.Brazil_GH1965	NA	MZ604175	NA	MZ604241	NA	MZ562621	NA	NA	
Leucauge_sp.Brazil_GH2009	NA	MZ604176		MZ604242	NA	MZ562654	NA	NA	
Leucauge_sp.Brazil_GH2298	NA	NA	NA	MZ604243	NA	MZ562643	MZ562824	MZ562865	
Leucauge_sp.Brazil_GH2304	NA	MZ604177	NA	MZ604244	NA	MZ562635	MZ562825	NA	
Leucauge_sp.Ecuador_GH2348	NA	NA	MZ604178	MZ604245	NA	MZ562644	MZ562827	NA	
Leucauge_sp.Gabon_GH2345	NA	NA	MZ604179	MZ604246	NA	MZ562665	MZ562826	NA	
Leucauge_sp.Madagascar_GH2358	NA	NA	NA	MZ604247	NA	MZ562667	NA	NA	
Leucauge_sp.Thailand_GH0596	NA	MZ604180		MZ604248	NA	MZ562669	NA	NA	
Leucauge_sp._1_Cameroon_GH2440	NA	MZ604181	NA	MZ604249	NA	MZ562658	MZ562828	MZ562866	
Leucauge_sp._3_Cameroon_GH2437	NA	MZ604182	NA	MZ604250	NA	MZ562626	MZ562829	MZ562879	
Leucauge_sp._4_Cameroon_GH2435	NA	MZ604183	NA	MZ604251	NA	MZ562659	MZ562830	MZ562880	
Leucauge_taiwanica_cf_tessellata_GH1768	NA	MZ604184	NA	MZ604252	NA	MZ562666	MZ562831	MZ562867	
Leucauge_venusta_GH1480	NA	NA	MZ604185	NA	NA	MG738588	NA	NA	
Leucauge_venusta_GH1483	NA	NA	MZ604186	NA	NA	MG738578	NA	NA	
Leucauge_venusta_GH1487	NA	NA	MZ604187	NA	NA	MG738554	NA	NA	
Leucauge_venusta_GH1509	NA	NA	MZ604188	NA	NA	MG738530	NA	NA	
Leucauge_venusta_GH1511	NA	NA	MZ604189	NA	NA	MG738561	NA	NA	
Leucauge_venusta_GH1513	NA	NA	MZ604190	NA	NA	MG738574	NA	NA	
Leucauge_venusta_GH1517	NA	NA	MZ604191	NA	NA	MG738531	NA	NA	
Leucauge_venusta_GH1533	NA	NA	MZ604192	NA	NA	MG738579	NA	NA	
Leucauge_venusta_GH1534	NA	NA	MZ604193	NA	NA	MG738580	NA	NA	
Leucauge_venusta_GH1537	NA	NA	MZ604194	NA	NA	MG738593	NA	NA	
Leucauge_volupis_GH1966	NA	NA	NA	MZ604253	NA	NA	NA	MZ562868	
Leucauge_volupis_GH2315	NA	MZ604195	NA	MZ604254	NA	MZ562660	NA	MZ562869	

Taxon name	<i>16S</i>	<i>18S1</i>	<i>18S2</i>	<i>28S2</i>	<i>28S3</i>	<i>COI</i>	<i>H3</i>	<i>H4</i>	References
Mecynometa_cf_globosa_GH1987	NA	NA	NA	NA	NA	MZ562636	NA	NA	
Mecynometa_cf_globosa_GH2004	NA	NA	NA	NA	NA	MZ562633	NA	NA	
Mecynometa_sp._A_GH2306	NA	MZ604196	NA	MZ604255	NA	MZ562637	MZ562832	MZ562870	
Mesida_argentiopunctata_GH1145	NA	MZ604197	NA	MZ604256	NA	NA	MZ562833	MZ562871	
Mesida_yini_GH2065	NA	NA	NA	MZ604257	NA	MZ562627	MZ562834	MZ562872	
Metabus_ocellatus_GH2352	MZ604142		MZ604198	MZ604258	NA	MZ562629	NA	MZ562873	
Okileucauge_hainan_GH2096	NA	NA	NA	MZ604259	NA	NA	MZ562835	MZ562874	
Okileucauge_hainan_GH2099	NA	NA	MZ604199	MZ604260	NA	MZ562630	MZ562836	NA	
Opas_caudacuta_GH2270	NA	MZ604200	NA	MZ604261	NA	NA	MZ562837	MZ562875	
Opas_caudacuta_GH2318	NA	MZ604201	NA	MZ604262	NA	MZ562656	MZ562838	MZ562876	
Opas_sp._GH2320	NA	MZ604202	NA	MZ604263	NA	NA	MZ562839	MZ562877	
Orsinome_vethi_GH0591	NA	MZ604203	NA	MZ604264	NA	MZ562638	MZ562840	MZ562878	

Table S3. Primer pairs and annealing temperatures

Locus	Temperature	Primer sequence (5'-3')	References
<i>COI</i>	42–48	Fwd: GGT CAA CAA ATC ATA AAG ATA TTG G	Folmer <i>et al.</i> 1994
		Rev: CCA GGT AAA ATT AAA ATA TAA ACT TC	Carpenter and Wheeler 1999
<i>16S</i>	40–45	Fwd: CGC CTG TTT ATC AAA AAC AT	Palumbi <i>et al.</i> 1991
		Rev: CTC CGG TTT GAA CTC AGA TCA	Palumbi <i>et al.</i> 1991
<i>18S</i>	48–52	Fwd: TAC CTG GTT GAT CCT GCC AGT AG	Giribet <i>et al.</i> 1996
		Rev: CTT GGC AAA TGC TTT CGC,	Giribet <i>et al.</i> 1996
	48–52	Fwd: CCA GCA GCC GCG CTA ATTC,	Giribet <i>et al.</i> 1996
		Rev: GCA TCA CAG ACC TGT TAT TGC	Giribet <i>et al.</i> 1996
<i>28S</i>	50	Fwd: GAC CCG TCT TGA AGC ACG	Whiting <i>et al.</i> 1997
		Rev: CCA CAG CGC CAG TTC TGC TTA C	Schwendinger and Giribet 2005
	45–50	Fwd: ACC TAT TCT CAA ACT TTA AAT GG	Schwendinger and Giribet 2005
		Rev: GAC TTC CCT TAC CTA CAT	Schwendinger and Giribet 2005
<i>H3</i>	56	Fwd: ATG GCT CGT ACC AAG CAG ACV GC	Colgan <i>et al.</i> 1998
<i>H4</i>	56	Rev: ATA TCC TTR GGC ATR ATR GTGAC	Colgan <i>et al.</i> 1998
		Fwd: ATG TCC GGC CGT GGA AAA GG	This study
		Rev: AAC CAC CCG AAG CCG TAC AGA G	This study

References

- Álvarez-Padilla, F., Dimitrov, D., Giribet, G., and Hormiga, G. (2009). Phylogenetic relationships of the spider family Tetragnathidae (Araneae, Araneoidea) based on morphological and DNA sequence data. *Cladistics* **25**(2), 109–146. [doi:10.1111/j.1096-0031.2008.00242.x](https://doi.org/10.1111/j.1096-0031.2008.00242.x)
- Arnedo, M. A., Coddington, J. A., Agnarsson, I., and Gillespie, R. G. (2004). From a comb to a tree: phylogenetic relationships of the comb-footed spiders (Araneae, Theridiidae) inferred from nuclear and mitochondrial genes. *Molecular Phylogenetics and Evolution* **31**(1), 225–245. [doi:10.1016/S1055-7903\(03\)00261-6](https://doi.org/10.1016/S1055-7903(03)00261-6)
- Blackledge, T. A., Scharff, N., Coddington, J. A., Szüts, T., Wenzel, J. W., Hayashi, C. Y., and Agnarsson, I. (2009). Reconstructing web evolution and spider diversification in the molecular era. *Proceedings of the National Academy of Sciences of the United States of America* **106**(13), 5229–5234. [doi:10.1073/pnas.0901377106](https://doi.org/10.1073/pnas.0901377106)
- Carpenter, J. M., and Wheeler, W. C. (1999). Towards simultaneous analysis of morphological and molecular data in Hymenoptera. *Zoologica Scripta* **28**(1–2), 251–260. [doi:10.1046/j.1463-6409.1999.00009.x](https://doi.org/10.1046/j.1463-6409.1999.00009.x)
- Colgan, D. J., McLauchlan, A., Wilson, G. D. F., Livingston, S. P., Edgecombe, G. D., Macaranas, J., Cassis, G., and Gray, M. R. (1998). Histone *H3* and *U2* snRNA DNA sequences and arthropod molecular evolution. *Australian Journal of Zoology* **46**(5), 419–437. [doi:10.1071/ZO98048](https://doi.org/10.1071/ZO98048)
- Dimitrov, D., and Hormiga, G. (2011). An extraordinary new genus of spiders from Western Australia with an expanded hypothesis on the phylogeny of Tetragnathidae (Araneae). *Zoological Journal of the Linnean Society* **161**(4), 735–768. [doi:10.1111/j.1096-3642.2010.00662.x](https://doi.org/10.1111/j.1096-3642.2010.00662.x)
- Dimitrov, D., Lopardo, L., Giribet, G., Arnedo, M. A., Álvarez-Padilla, F., and Hormiga, G. (2012). Tangled in a sparse spider web: single origin of orb weavers and their spinning work unravelled by denser taxonomic sampling. *Proceedings of the Royal Society of London – B. Biological Sciences* **279**(1732), 1341–1350. [doi:10.1098/rspb.2011.2011](https://doi.org/10.1098/rspb.2011.2011)
- Dimitrov, D., Benavides, L. R., Arnedo, M. A., Giribet, G., Griswold, C. E., Scharff, N., and Hormiga, G. (2017). Rounding up the usual suspects: a standard target-gene approach for resolving the interfamilial phylogenetic relationships of cribellate orb-weaving spiders with a new family-rank classification (Araneae, Araneoidea). *Cladistics* **33**(3), 221–250. [doi:10.1111/cla.12165](https://doi.org/10.1111/cla.12165)
- Folmer, O., Black, M., Hoeh, W., Lutz, R., and Vrijenhoek, R. (1994). DNA primers for amplification of mitochondrial cytochrome C oxidase subunit I from diverse metazoan invertebrates. *Molecular Marine Biology and Biotechnology* **3**(5), 294–299.
- Giribet, G., Carranza, S., Bagnà, J., Riutort, M., and Ribera, C. (1996). First molecular evidence for the existence of a Tardigrada + Arthropoda clade. *Molecular Biology and Evolution* **13**(1), 76–84. [doi:10.1093/oxfordjournals.molbev.a025573](https://doi.org/10.1093/oxfordjournals.molbev.a025573)
- Kuntner, M., Arnedo, M. A., Trontelj, P., Lokovšek, T., and Agnarsson, I. (2013). A molecular phylogeny of nephilid spiders: evolutionary history of a model lineage. *Molecular Phylogenetics and Evolution* **69**(3), 961–979. [doi:10.1016/j.ympev.2013.06.008](https://doi.org/10.1016/j.ympev.2013.06.008)
- Palumbi, S. R., Martin, A., Romano, S., McMillan, W. O., Stice, L., and Grabowski, G. (1991). ‘The Simple Fool’s Guide to PCR.’ (University of Hawaii, Honolulu, HI, USA.)

- Su, Y., Chang, Y. C., Smith, D., Zhu, M., Kuntner, M., and Tso, I. (2011). Biogeography and speciation patterns of the golden orb spider genus *Nephila* (Araneae: Nephilidae) in Asia. *Zoological Science* **28**(1), 47–55. [doi:10.2108/zsj.28.47](https://doi.org/10.2108/zsj.28.47)
- Schwendinger, P. J., and Giribet, G. (2005). The systematics of the south-east Asian genus *Fangensis* Rambla (Opiliones: Cyphophthalmi: Stylocellidae). *Invertebrate Systematics* **19**(4), 297–323. [doi:10.1071/IS05023](https://doi.org/10.1071/IS05023)
- Whiting, M. F., Carpenter, J. C., Wheeler, Q. C., and Wheeler, W. C. (1997). The Strepsiptera problem: phylogeny of the holometabolous insect orders inferred from 18S and 28S ribosomal DNA sequences and morphology. *Systematic Biology* **46**(1), 1–68. [doi:10.1093/sysbio/46.1.1](https://doi.org/10.1093/sysbio/46.1.1)