Supporting Information

Renewed diversification is associated with new ecological opportunity in the Neotropical turtle ants

Shauna L. Price, Scott Powell, Daniel J. C. Kronauer, Lucy A. P. Tran, Naomi E. Pierce, and R. K. Wayne

Appendix S1: Materials and methods

Molecular methods

Molecular work was conducted at UCLA and Harvard. At UCLA PCR was performed in 25 µL volumes: 16.3 µL ddH_2O, 2.5 µL 10x PCR Buffer, 1.5 µL 25 mM $MgCl_2$, 0.5 µL dNTPs (25mM each), 1 µL DMSO, 0.2 µL of each primer (25x), 0.2 µL QIAGEN Taq DNA Polymerase, and 2 µL DNA. PCR cycles were: initial denaturation for 3 min at 94^o, followed by 30 cycles of 94^o for 30 s, 50-58^o for 30 s, and 72^o for 45 s, and a final extension of 72^o for 5 min. Annealing temperatures depended on the gene segment amplified. PCR products were purified with Exonuclease I and Shrimp Alkaline Phosphatase. At Harvard PCR was performed in 25 µL volumes with the same PCR conditions as UCLA and a cocktail containing 15.05 µL ddH_2O, 2.5 µL 10x PCR Buffer, 1 µL 25 mM $MgCl_2$, 0.25 µL dNTPs (25mM each), 2 µL of each primer (10x), 0.2 µL QIAGEN Taq DNA Polymerase, and 2 µL DNA. PCR products were sent to Macrogen for purification. All loci were sequenced in both directions using an ABI 3730 automated sequencer with Big Dye Terminator chemistry (Applied Biosystems Inc) either at Macrogen or the Cornell University Life Sciences Core Laboratories Center. Heterozygous positions were left ambiguous and occurred in less than 0.0007% of nuclear base pairs.

Species monophyly

We performed Bayesian inference (BI) using 2-4 individuals of 12 widespread turtle ant species in order to test species monophyly (Table S1). We used MrBayes v3.1.2 (Huelsenbeck & Ronquist, 2001; Ronquist & Huelsenbeck, 2003) on the molecular data set. Data were partitioned by nuclear gene segment and each mitochondrial codon position, and we applied a GTR+G model to each partition. We ran this analysis for 20 million generations, sampling every 1000 generations, with a heating parameter of 0.1 to increase mixing between chains.

Morphological phylogeny

The model-based framework of BI was used to compare results from a previously published morphological phylogeny that was constructed using maximum parsimony (de Andrade & Baroni-Urbani, 1999). We performed BI on the 131 character morphological data set using MrBayes. We ran two independent runs with four chains (one cold, three heated) for ten million generations, sampling every 1000 generations, and applied the Markov model (Lewis, 2001) with a gamma parameter.

Appendix S2: Results

Species monophyly

In analyses including multiple individuals per species, species monophyly was supported in all but two cases (Fig. S2). First, *Cephalotes atratus* is paraphyletic with respect to its putative sister species, *C. marginatus*. Second, *C. bohlsi* is paraphyletic with respect to an undescribed species in the fiebrigi clade. These results suggest that *C. marginatus* and the undescribed species may be geographic variants of *C. atratus* and *C. bohlsi*, respectively. Alternatively, *C. atratus* or *C. bohlsi* may actually be two or more species. More work is needed to discern between these possibilities.

Figure S1. Bayesian consensus phylogram of *Cephalotes* using the molecular data set, which includes multiple individuals for 12 species. PP values ≥ 0.95 are given.

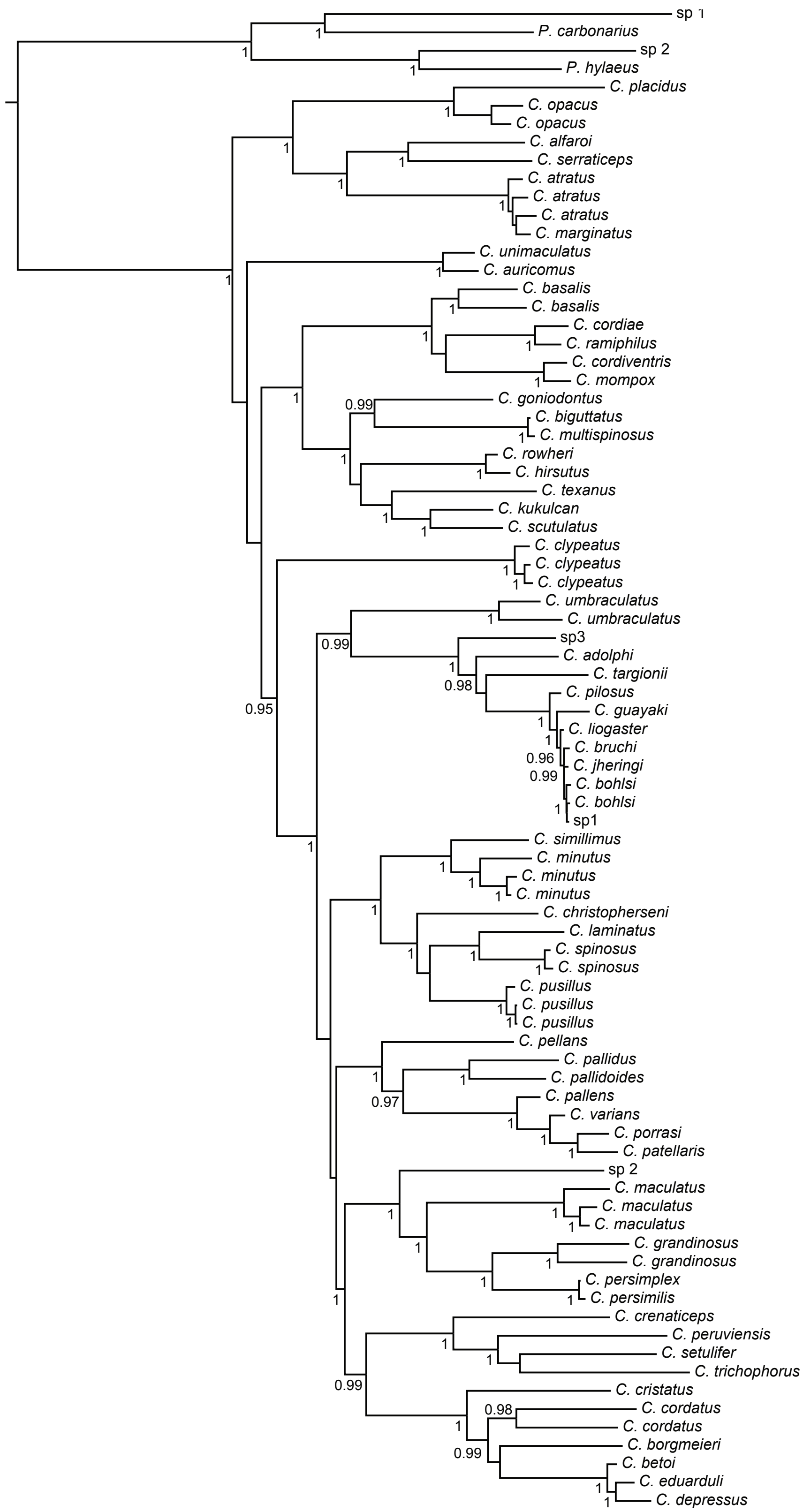

Figure S2. Bayesian consensus phylogram of extant and extinct species (indicated by †) based on molecular and morphological data. This combined analysis was used to determine fossil calibration points for divergence dating analysis. Though many nodes were not well supported, we defined calibration points where extinct species fell within well supported species groups in molecular only analyses. Species used in the calibration are in bold.

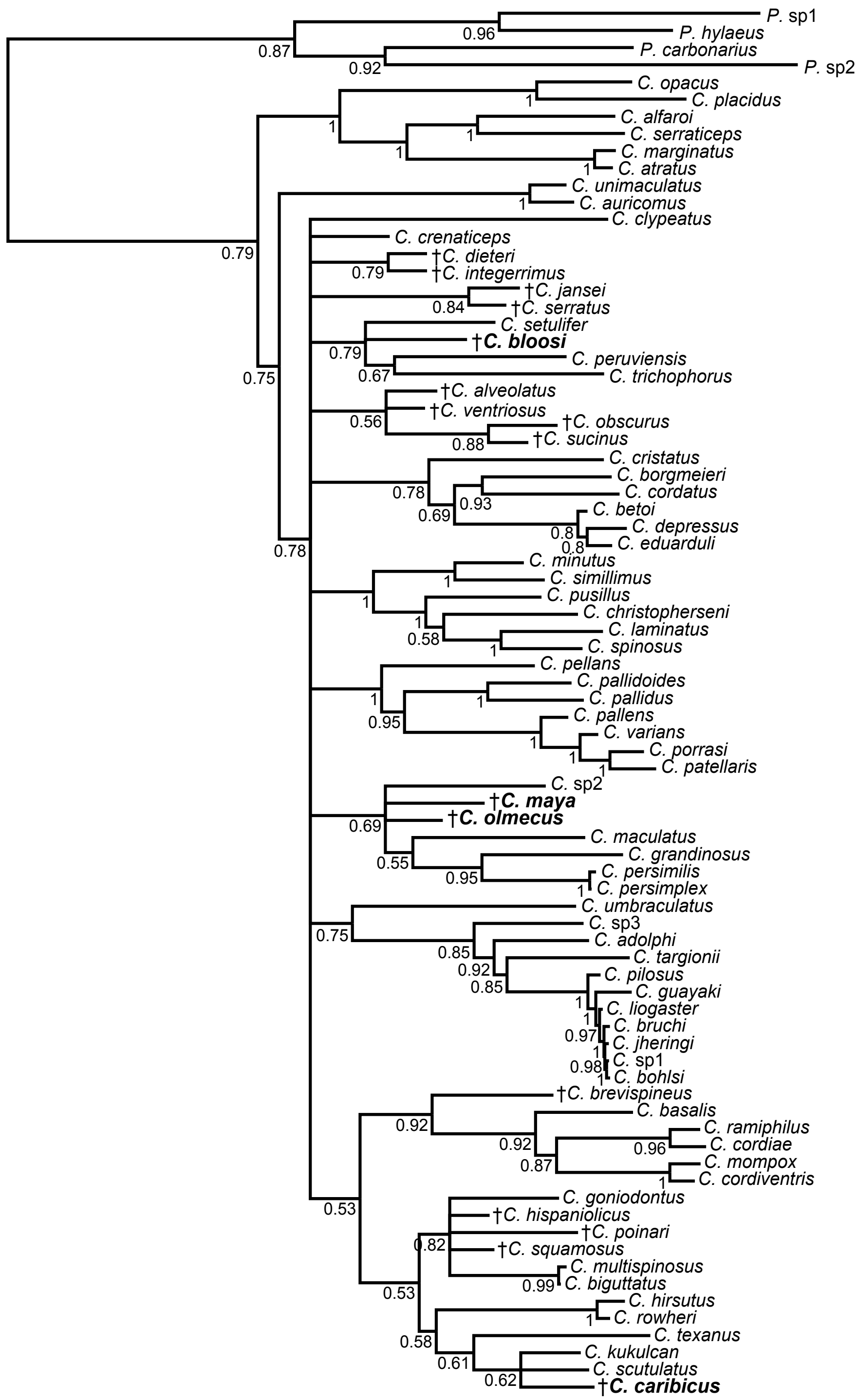

Figure S3. Primary concordance tree obtained from the Bayesian concordance analysis of the molecular data set. Concordance factors are shown at nodes.

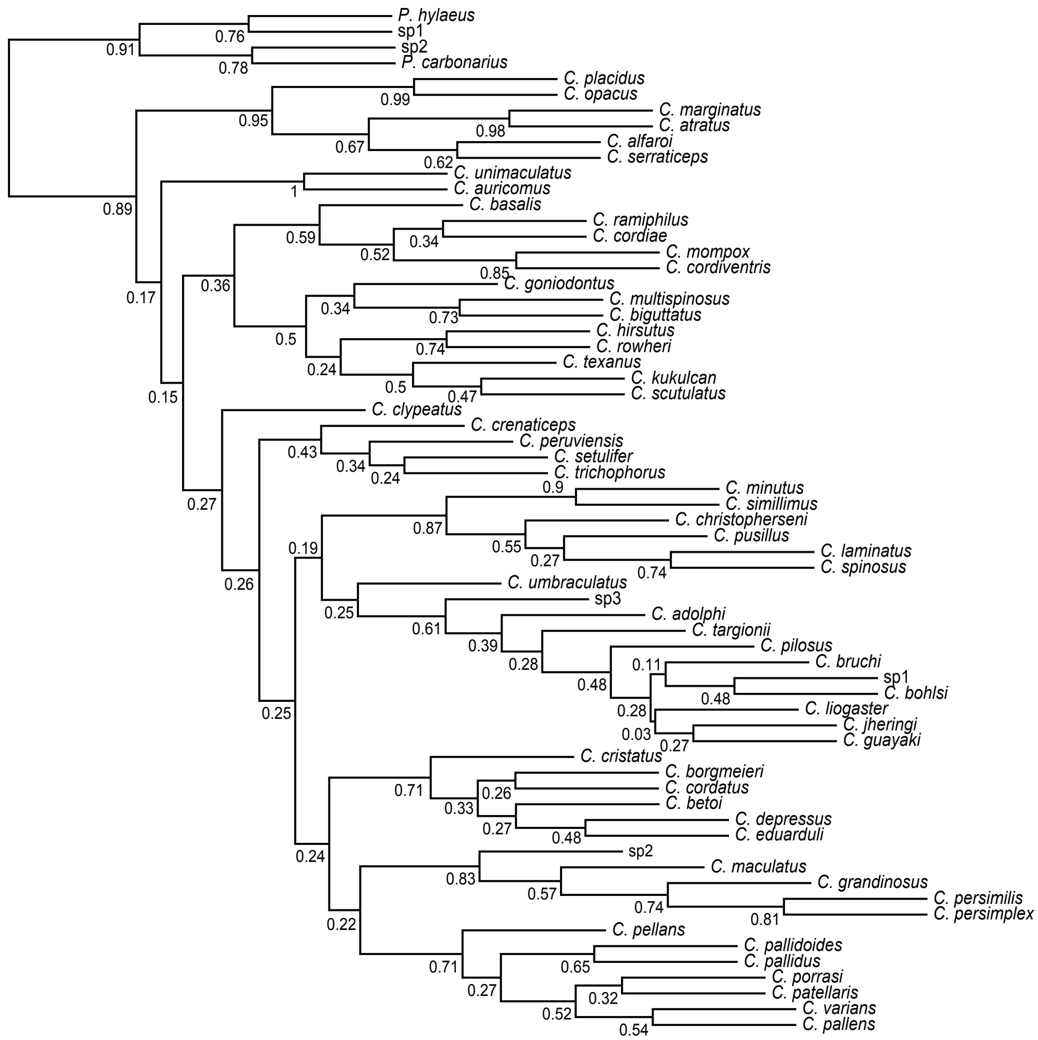

Figure S4. Bayesian consensus phylogram of the 131 character morphological data set for *Cephalotes*. PP values ≥ 0.90 are given.

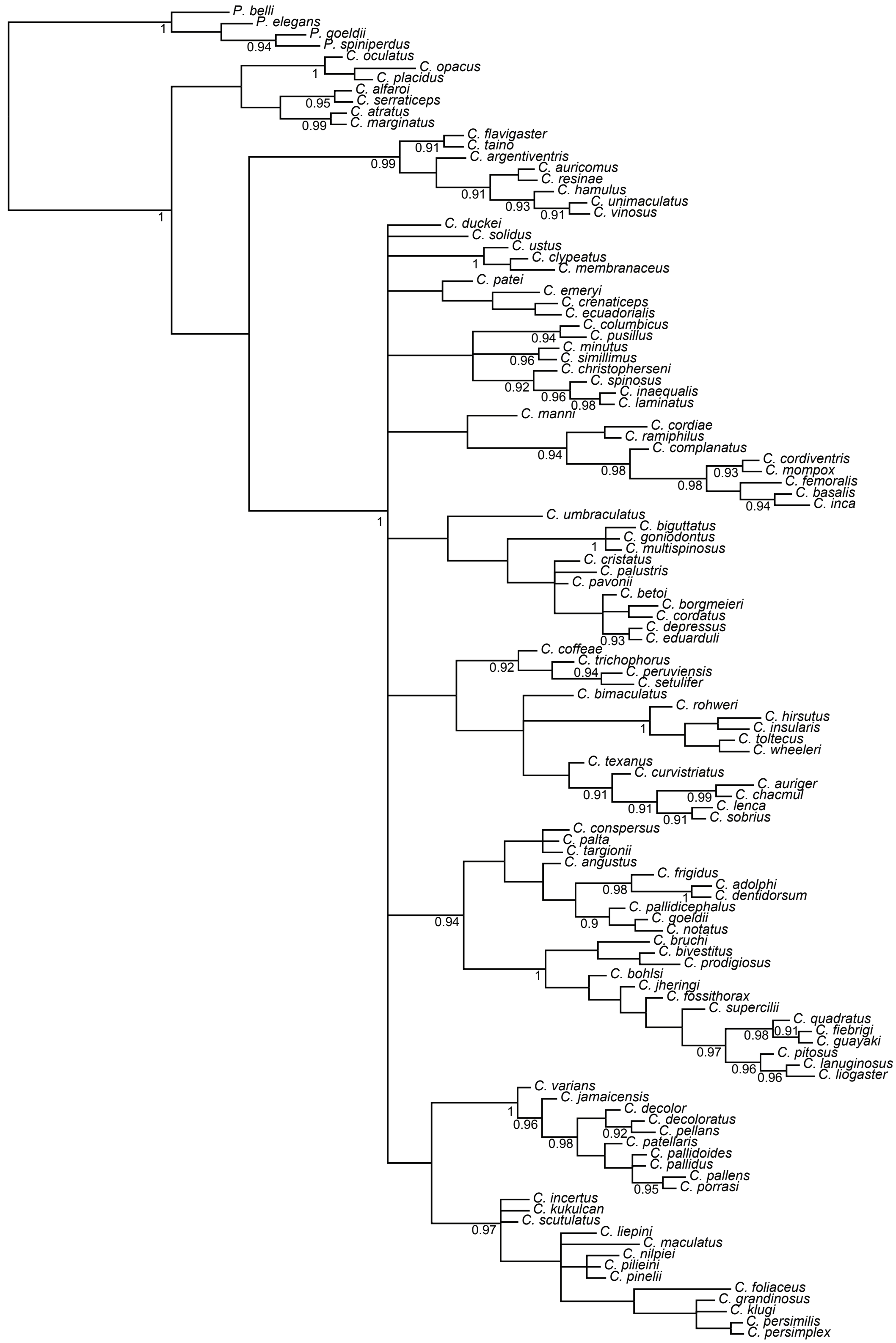

Table S1. Species sequenced, voucher numbers, detailed locality information (where known), and deposit location for specimens used in phylogenetic analyses. *Procryptocerus* species were used as outgroups. Deposit location abbreviations are: Natural History Museum Los Angeles County (LACM), Federal University of Uberlandia (UFU), National Museum of Natural History (NMNH), National Biodiversity Institute, Costa Rica (INBio), and George Washington University (GW). Specimens at GW are in the personal collection of S. Powell and are being prepared for curation on AntWeb.org.

Species	**Voucher #**	**Locality**	**State/Province**	**Country**	**Deposit Loc.**
Cephalotes adolphi	CP-07-3	Reserve of Clube Caça e Pesca Itororó	Minas Gerais	Brazil	UFU
Cephalotes alfaroi	SY01	La Selva Biological Station	Heredia	Costa Rica	GW
Cephalotes atratus	CP-07-7	Reserve of Clube Caça e Pesca Itororó	Minas Gerais	Brazil	UFU
Cephalotes atratus	BM01	Noragues Field Station	Cayenne	F. Guyana	GW
Cephalotes atratus	SP44	Iquitos-Nauta Highway	Loreto	Peru	GW
Cephalotes auricomus	MLA01	Luperón	Puerto Plata	Dom. Rep.	LACM
Cephalotes basalis	GB14	Ft. Sherman	Colon	Panama	GW
Cephalotes basalis	JTL04	La Selva Biological Station	Heredia	Costa Rica	GW
Cephalotes betoi	SGB02	Gerais de Balsas	Maranhão	Brazil	NMNH
Cephalotes biguttatus	SY02	La Selva Biological Station	Heredia	Costa Rica	GW
Cephalotes bohlsi	AW0620	Route 4	Ñeembucú	Paraguay	GW
Cephalotes bohlsi	SP168	Corrientes	Chaco	Argentina	GW
Cephalotes borgmeieri	CP-07-10	Reserve of Clube Caça e Pesca Itororó	Minas Gerais	Brazil	UFU
Cephalotes bruchi	KK38	El Chaco National Park	Chaco	Argentina	GW
Cephalotes christopherseni	SP100	Parque Metropolitano	Panama	Panama	GW
Cephalotes clypeatus	CP-07-16	Estação Ecológica do Panga	Minas Gerais	Brazil	UFU
Cephalotes clypeatus	AVS2292	Herradura	Formosa	Argentina	GW
Cephalotes clypeatus	SP83	Los Amigos Biological Station	Madre de Dios	Peru	GW
Cephalotes cordatus	CP-07-13	Reserve of Clube Caça e Pesca Itororó	Minas Gerais	Brazil	UFU
Cephalotes cordatus	JSC01	Rio Alto Madre de Dios	Madre de Dios	Peru	NMNH
Cephalotes cordiae	JSC04	Rio Alto Madre de Dios	Madre de Dios	Peru	NMNH
Cephalotes cordiventris	GB19	Gamboa	Colon	Panama	GW
Cephalotes crenaticeps	ER8			Venezuela	GW
Cephalotes cristatus	SY03	La Selva Biological Station	Heredia	Costa Rica	GW
Cephalotes depressus	AVS3076	Herradura	Formosa	Argentina	GW
Cephalotes eduarduli	AW04	Route 4	Ñeembucú	Paraguay	GW
Cephalotes goniodontus	DMG01	Chamela	Jalisco	Mexico	GW

Species	Voucher #	Locality	State/Province	Country	Deposit Loc.
Cephalotes grandinosus	CP-07-11	Reserve of Clube Caça e Pesca Itororó	Minas Gerais	Brazil	UFU
Cephalotes grandinosus	GB15	Ft. Sherman	Colon	Panama	GW
Cephalotes guayaki	AW05	Route 4	Ñeembucú	Paraguay	GW
Cephalotes hirsutus	PSW15796			Mexico	GW
Cephalotes jheringi	AVS2187	Ocampo	Santa Fe	Argentina	GW
Cephalotes kukulcan	JTL01	Utila	Atlantida	Honduras	GW
Cephalotes laminatus	CP-07-24	Tiputini Biodiversity Station	Orellana	Ecuador	GW
Cephalotes liogaster	PSW12398			Bolivia	GW
Cephalotes maculatus	CP-07-2	Reserve of Clube Caça e Pesca Itororó	Minas Gerais	Brazil	UFU
Cephalotes maculatus	GB49	Parque Metropolitano	Panama	Panama	GW
Cephalotes maculatus	JTL07	Sierra Morena	Chiapas	Mexico	GW
Cephalotes marginatus	DK07	Alta Floresta	Mato Grosso	Venezuela	GW
Cephalotes minutus	CP-07-18	Estação Ecológica do Panga	Minas Gerais	Brazil	UFU
Cephalotes minutus	JSC06	Nassau Mountains, Base Camp	Sipaliwini	Suriname	GW
Cephalotes minutus	JSL03	Kanuku Mountains	Upper Takutu-Upper Essequibo	Guyana	GW
Cephalotes minutus	SP127	Parque Metropolitano	Panama	Panama	GW
Cephalotes mompox	ER4	Ocumare de la Costa	Aragua	Venezuela	GW
Cephalotes multispinosus	CP-07-29	La Selva Biological Station	Heredia	Costa Rica	GW
Cephalotes opacus	SP35	Zungarococha	Loreto	Peru	GW
Cephalotes opacus	TRS10	Cipu River Camp	Upper Takutu-Upper Essequibo	Guyana	NMNH
Cephalotes pallens	JTL05	Santa Rosa National Park	Guanacaste	Costa Rica	GW
Cephalotes pallidoides	CP-07-4	Reserve of Clube Caça e Pesca Itororó	Minas Gerais	Brazil	UFU
Cephalotes pallidus	PSW11330			Ecuador	GW
Cephalotes patellaris	GB16	Ft. Sherman	Colon	Panama	GW
Cephalotes pellans	CP-07-1	Reserve of Clube Caça e Pesca Itororó	Minas Gerais	Brazil	UFU
Cephalotes persimilis	CP-07-14	Reserve of Clube Caça e Pesca Itororó	Minas Gerais	Brazil	UFU
Cephalotes persimplex	PSW12322			Bolivia	GW
Cephalotes peruviensis	CP-07-25	Tiputini Biodiversity Station	Orellana	Ecuador	GW
Cephalotes pilosus	CP-07-17	Reserve of Clube Caça e Pesca Itororó	Minas Gerais	Brazil	UFU
Cephalotes placidus	SP81	Los Amigos Biological Station	Madre de Dios	Peru	GW
Cephalotes porrasi	GB11	Pipeline Road	Colon	Panama	GW
Cephalotes pusillus	CP-07-12	Reserve of Clube Caça e Pesca Itororó	Minas Gerais	Brazil	UFU

Species	Voucher #	Locality	State/Province	Country	Deposit Loc.
Cephalotes pusillus	TRS08	Kanuku Mountains	Upper Takutu-Upper Essequibo	Guyana	NMNH
Cephalotes pusillus	AVS1935	Herradura	Formosa	Argentina	GW
Cephalotes ramiphilus	CP-07-26	Tiputini Biodiversity Station	Orellana	Ecuador	GW
Cephalotes rowheri	RS01	Tucson	Arizona	USA	GW
Cephalotes scutulatus	JTL02	Utila	Atlantida	Honduras	GW
Cephalotes serraticeps	SY13	Iquitos-Nauta Highway	Loreto	Peru	GW
Cephalotes setulifer	JTL06	La Selva Biological Station	Heredia	Costa Rica	INBio
Cephalotes simillimus	TRS06	Noragues Field Station	Cayenne	F. Guyana	NMNH
Cephalotes sp. nov. 1	CP-07-8	Reserve of Clube Caça e Pesca Itororó	Minas Gerais	Brazil	UFU
Cephalotes sp. nov. 2	CP-07-18b	Estação Ecológica do Panga	Minas Gerais	Brazil	UFU
Cephalotes sp. nov. 3	CP-07-5	Reserve of Clube Caça e Pesca Itororó	Minas Gerais	Brazil	UFU
Cephalotes spinosus	JSC02	Bahkuis	Sipaliwini	Suriname	NMNH
Cephalotes spinosus	JSC03	Tambopata	Madre do Dios	Peru	NMNH
Cephalotes targionii	ER5	Ocumare de la Costa	Aragua	Venezuela	GW
Cephalotes texanus	SY04	Beeville	TX	USA	GW
Cephalotes trichophorus	SY12	Iquitos-Nauta Highway	Loreto	Peru	GW
Cephalotes umbraculatus	GB52	Parque Metropolitano	Panama	Panama	GW
Cephalotes umbraculatus	SP91	Los Amigos Biological Station	Madre de Dios	Peru	GW
Cephalotes unimaculatus	MI01	Cabo Rojo	Pedernales	Dom. Rep.	LACM
Cephalotes varians	JS1	Sugarloaf Key	Florida	USA	GW
Procryptocerus carbonarius	PSW11498			Ecuador	GW
Procryptocerus hylaeus	CP-07-15	Reserve of Clube Caça e Pesca Itororó	Minas Gerais	Brazil	UFU
Procryptocerus sp. 1	ER9			Venezuela	GW
Procryptocerus sp. 2	JSC05	Bahkuis	Sipaliwini	Suriname	NMNH

Table S2. Twenty-four species groups based on morphological characters were described in de Andrade & Baroni-Urbani (1999). Our sampling spanned 19 groups with percent coverage ranging from 0-100%. Only extant species are included in the total number of species sampled.

Morphological group	# species sampled	Total # species	% group coverage
angustus	2	10	20
atratus	6	7	86
basalis	5	9	56
bimaculatus	0	1	0
bruchi	1	1	100
clypeatus	1	3	33
coffeae	3	4	75
crenaticeps	1	2	50
depressus	6	8	75
emeryi	0	1	0
fiebrigi	5	10	50
grandinosus	3	5	60
hamulus	2	8	25
laminatus	5	7	71
multispinosus	3	3	100
pallens	7	10	70
patei	0	1	0
pinelii	3	8	38
prodigiosus	0	2	0
pusillus	1	2	50
solidus	0	1	0
texanus	1	6	17
umbraculatus	1	1	100
wheeleri	2	5	40

Table S3. Primers used and annealing temperatures (Tm) for PCR amplification and sequencing of long wavelength rhodopsin (LR), wingless (Wg), elongation factor 1α F2 (EF1αF2), cytochrome oxidase I (COI), cytochrome oxidase II (COII), and cytochrome b (Cytb). In some cases alternative primers (not shown) were designed due to issues with numt amplification. Several primer sets were designed to overlap for easier sequence assembly and used to amplify and sequence COI and a segment of COII. Though we also sequenced an internal transcribed spaced (ITS) and tRNA-Leucine (Leu), we only included COI and COII in our analysis. Depending on the species, Jerry was combined with either LeuRev1 or LeuRev2.

Gene	**Primer**	**Sequence (5'-3')**	**Tm (°C)**	**Source**
LR	LR143F	GACAAAGTKCCACCRGARATGCT	52°C	Ward & Downie, 2005
	LR639ER	YTTACCGRTTCCATCCRAACA		Ward & Downie, 2005
EF1αF2	F2-557F	GAACGTGAACGTGGTATYACSAT	53°C	Schultz & Brady, 2008
	F2-1118R	TTACCTGAAGGGGAAGACGRAG		Brady *et al*., 2006
Wg	Wg503F	CTCTCTCATTACAGCACGT	52°C	Schultz & Brady, 2008
	Wg1032R	ACTTCGCAGCACCAATGGAA		Abouheif & Wray, 2002
Cytb	CB1	TATGTACTACCATGAGGACAAATATC	50°C	Chiotis *et al*., 2000
	CB2	ATTACACCTCCTAATTTATTAGGAAT		Chiotis *et al*., 2000
COI	LCO 1490	GGTCAACAAATCATAAAGATATTGG	50°C	Folmer *et al*., 1994
	HCO 2198	TAAACTTCAGGGTGACCAAAAAATCA		Folmer *et al*., 1994
COI	C1-J2183	CAACATTTATTTTGATTTTTTGG	52°C	Simon *et al*., 1994
	LeuRev1	CCATTGCACTAATCTGCCATA		designed for this study
	LeuRev2	ATGGRGTTTAARTCCATTGC		designed for this study
COI-ITS-	C1-J2792	ATACCTCGACGTTATTCAGA	50°C	Bogdanowicz *et al*., 1993
Leu-COII	C2-N3661	CCACAAATTTCTGAACATTGACCA		Simon *et al*., 1994

Table S4. Species sequenced, voucher numbers, and GenBank accession numbers (blank spaces are missing sequences) for specimens used in phylogenetic analyses. Exons 1 and 2 for EF1αF2 were submitted separately to GenBank.

Species	**Voucher #**	***COI***	***COII***	***Cytb***	***Wg***	***LR* exon 1**	***LR* exon 2**	***EFaF2***
Cephalotes adolphi	CP-07-3	KC335729	KC335658	KC205482	KC335577	KC335811	KC335894	KC208513
Cephalotes alfaroi	SY01	KC335800	KC335719	KC205547	KC335647	KC335883	KC335966	KC208584
Cephalotes atratus	CP-07-7	KC335732	KC335661	KC205484	KC335580	KC335814	KC335897	KC208516
Cephalotes atratus	BM01	KC335755	KC335680	KC205506	KC335602	KC335837	KC335920	KC208539
Cephalotes atratus	SP44	KC335793	KC335712	KC205540	KC335640	KC335876	KC335959	KC208578
Cephalotes auricomus	MLA01	KC335785		KC205531	KC335632	KC335867	KC335950	KC208569
Cephalotes basalis	GB14	KC335763	KC335688	KC205513	KC335610	KC335845	KC335928	KC208547
Cephalotes basalis	JTL04	KC335779	KC335702	KC205525	KC335626	KC335861	KC335944	KC208563
Cephalotes betoi	SGB02	KC335791	KC335710	KC205538	KC335638	KC335874	KC335957	KC208576
Cephalotes biguttatus	SY02	KC335801	KC335720	KC205548	KC335648	KC335884	KC335967	KC208585
Cephalotes bohlsi	AW0620	KC335754	KC335679	KC205505	KC335601	KC335836	KC335919	KC208538
Cephalotes bohlsi	SP168	KC335799	KC335718	KC205546		KC335646	KC335882	KC335965
Cephalotes borgmeieri	CP-07-10	KC335734	KC335663	KC205486	KC335582	KC335816	KC335899	KC208518
Cephalotes bruchi	KK38	KC335783	KC335705	KC205529	KC335630	KC335865	KC335948	KC208567
Cephalotes christopherseni	SP100	KC335797	KC335716	KC205544	KC335644	KC335880	KC335963	KC208582
Cephalotes clypeatus	CP-07-16	KC335740	KC335667	KC205492	KC335588	KC335821	KC335905	KC208524
Cephalotes clypeatus	AVS2292	KC335750	KC335676	KC205501	KC335597	KC335832	KC335915	KC208534
Cephalotes clypeatus	SP83	KC335795	KC335714	KC205542	KC335642	KC335878	KC335961	KC208580
Cephalotes cordatus	CP-07-13	KC335737		KC205489	KC335585	KC335819	KC335902	KC208521
Cephalotes cordatus	JSC01	KC335770	KC335694		KC335617	KC335852	KC335935	KC208554
Cephalotes cordiae	JSC04	KC335773		KC205520	KC335620	KC335855	KC335938	KC208557
Cephalotes cordiventris	GB19	KC335766	KC335691	KC205515	KC335613	KC335848	KC335931	KC208550
Cephalotes crenaticeps	ER8	KC335760	KC335685	KC205511	KC335607	KC335842	KC335925	KC208544
Cephalotes cristatus	SY03	KC335802	KC335721	KC205549	KC335649	KC335885	KC335968	KC208586
Cephalotes depressus	AVS3076	KC335751	KC335677	KC205502	KC335598	KC335833	KC335916	KC208535
Cephalotes eduarduli	AW04	KC335752		KC205503	KC335599	KC335834	KC335917	KC208536
Cephalotes goniodontus	DMG01	KC335757	KC335682	KC205508	KC335604	KC335839	KC335922	KC208541
Cephalotes grandinosus	CP-07-11	KC335735	KC335664	KC205487	KC335583	KC335817	KC335900	KC208519
Cephalotes grandinosus	GB15	KC335764	KC335689	KC205514	KC335611	KC335846	KC335929	KC208548
Cephalotes guayaki	AW05	KC335753	KC335678	KC205504	KC335600	KC335835	KC335918	KC208537

Species	**Voucher #**	***COI***	***COII***	***Cytb***	***Wg***	***LR* exon 1**	***LR* exon 2**	***EFaF2***
Cephalotes hirsutus	PSW15796	KC335789	KC335708	KC205536		KC335872	KC335955	KC208574
Cephalotes jheringi	AVS2187	KC335749	KC335675	KC205500	KC335596	KC335831	KC335914	KC208533
Cephalotes kukulcan	JTL01	KC335777	KC335700	KC205523	KC335624	KC335859	KC335942	KC208561
Cephalotes laminatus	CP-07-24	KC335744	KC335671	KC335592	KC335826	KC335909	KC208528	
Cephalotes liogaster	PSW12398	KC335788	KC335707	KC205535	KC335636	KC335871	KC335954	KC208573
Cephalotes maculatus	CP-07-2	KC335728	KC335657	KC205481	KC335576	KC335810	KC335893	KC208512
Cephalotes maculatus	GB49	KC335767	KC335692		KC335614	KC335849	KC335932	KC208551
Cephalotes maculatus	JTL07	KC335782	KC335705	KC205528	KC335629	KC335864	KC335947	KC208566
Cephalotes marginatus	DK07	KC335756	KC335681	KC205507	KC335603	KC335838	KC335921	KC208540
Cephalotes minutus	CP-07-18	KC335742	KC335669	KC205494	KC335590	KC335824	KC335907	KC208526
Cephalotes minutus	JSC06	KC335775	KC335698	KC205521	KC335622	KC335857	KC335940	KC208559
Cephalotes minutus	JSL03	KC335776	KC335699	KC205522	KC335623	KC335858	KC335941	KC208560
Cephalotes minutus	SP127	KC335798	KC335717	KC205545	KC335645	KC335881	KC335964	KC208583
Cephalotes mompox	ER4	KC335758	KC335683	KC205509	KC335605	KC335840	KC335923	KC208542
Cephalotes multispinosus	CP-07-29	KC335747		KC205498	KC335594	KC335829	KC335912	KC208531
Cephalotes opacus	SP35	KC335792	KC335711	KC205539	KC335639	KC335875	KC335958	KC208577
Cephalotes opacus	TRS10	KC335808	KC335726	KC205554	KC335655	KC335891	KC335974	KC208592
Cephalotes pallens	JTL05	KC335780	KC335703	KC205526	KC335627	KC335862	KC335945	KC208564
Cephalotes pallidoides	CP-07-4	KC335730	KC335659		KC335578	KC335812	KC335895	KC208514
Cephalotes pallidus	PSW11330			KC205532	KC335633	KC335868	KC335951	KC208570
Cephalotes patellaris	GB16	KC335765	KC335690		KC335612	KC335847	KC335930	KC208549
Cephalotes pellans	CP-07-1	KC335727	KC335655	KC205480	KC335575	KC335809	KC335892	KC205554
Cephalotes persimilis	CP-07-14	KC335738		KC205490	KC335586	KC335820	KC335903	KC208522
Cephalotes persimplex	PSW12322	KC335787		KC205534	KC335635	KC335870	KC335953	KC208572
Cephalotes peruviensis	CP-07-25	KC335745	KC335672	KC205496	KC335593	KC335827	KC335910	KC208529
Cephalotes pilosus	CP-07-17	KC335741	KC335668	KC205493	KC335589	KC335823	KC335906	KC208525
Cephalotes placidus	SP81	KC335794	KC335713	KC205541	KC335641	KC335877	KC335960	KC208579
Cephalotes porrasi	GB11	KC335762	KC335687	KC335609	KC335844	KC335927	KC208546	
Cephalotes pusillus	CP-07-12	KC335736	KC335665	KC205488	KC335584	KC335818	KC335901	KC208520
Cephalotes pusillus	TRS08	KC335807	KC335725	KC205553	KC335654	KC335890	KC335973	KC208591
Cephalotes pusillus	AVS1935	KC335748	KC335674	KC205499	KC335595	KC335830	KC335913	KC208532
Cephalotes ramiphilus	CP-07-26	KC335746	KC335673	KC205497		KC335828	KC335911	KC208530

Species	**Voucher #**	***COI***	***COII***	***Cytb***	***Wg***	***LR* exon 1**	***LR* exon 2**	***EFaF2***
Cephalotes rowheri	RS01	KC335790	KC335709	KC205537	KC335637	KC335873	KC335956	KC208575
Cephalotes scutulatus	JTL02	KC335778	KC335701	KC205524	KC335625	KC335860	KC335943	KC208562
Cephalotes serraticeps	SY13	KC335805	KC335724	KC205552	KC335652	KC335888	KC335971	KC208589
Cephalotes setulifer	JTL06	KC335781	KC335704	KC205527	KC335628	KC335863	KC335946	KC208565
Cephalotes simillimus	TRS06	KC335806			KC335653	KC335889	KC335972	KC208590
Cephalotes sp. nov. 1	CP-07-8	KC335733	KC335662	KC205485	KC335581	KC335815	KC335898	KC208517
Cephalotes sp. nov. 2	CP-07-18b	KC335743	KC335670	KC205495	KC335591	KC335825	KC335908	KC208527
Cephalotes sp. nov. 3	CP-07-5	KC335731	KC335660	KC205483	KC335579	KC335813	KC335896	KC208515
Cephalotes spinosus	JSC02	KC335771	KC335695	KC205518	KC335618	KC335853	KC335936	KC208555
Cephalotes spinosus	JSC03	KC335772	KC335696	KC205519	KC335619	KC335854	KC335937	KC208556
Cephalotes targionii	ER5	KC335759	KC335684	KC205510	KC335606	KC335841	KC335924	KC208543
Cephalotes texanus	SY04	KC335803	KC335722	KC205550	KC335650	KC335886	KC335969	KC208587
Cephalotes trichophorus	SY12	KC335804	KC335723	KC205551	KC335651	KC335887	KC335970	KC208588
Cephalotes umbraculatus	GB52	KC335768	KC335693	KC205516	KC335615	KC335850	KC335933	KC208552
Cephalotes umbraculatus	SP91	KC335796	KC335715	KC205543	KC335643	KC335879	KC335962	KC208581
Cephalotes unimaculatus	MI01	KC335784		KC205530	KC335631	KC335866	KC335949	KC208568
Cephalotes varians	JS1	KC335769		KC205517	KC335616	KC335851	KC335934	KC208553
Procrypocerus carbonarius	PSW11498	KC335786		KC205533	KC335634	KC335869	KC335952	KC208571
Procrypocerus hylaeus	CP-07-15	KC335739	KC335666	KC205491	KC335587	KC335821	KC335904	KC208523
Procrypocerus sp. 1	ER9	KC335761	KC335686	KC205512	KC335608	KC335843	KC335926	KC208545
Procrypocerus sp. 2	JSC05	KC335774	KC335697		KC335621	KC335856	KC335939	KC208558

References

Abouheif, E. & Wray, G.A. 2002. Evolution of the gene network underlying wing polyphenism in ants. *Science* **297**: 249–252.

de Andrade, M.L. & Baroni-Urbani, C. 1999. Diversity and adaptation in the ant genus *Cephalotes*, past and present (Hymenoptera, Formicidae). *Stuttgarter Beitr. Naturkd., Ser. B* **271**: 1–889.

Bogdanowicz, S. M., Wallner, W.E., Bell, J., Odell, T.M. & Harrison, R.G. 1993. Asian gypsy moths (Lepidoptera, Lymantriidae) in North America - evidence from molecular data. *Ann. Entomol. Soc. Am.* **86**: 710–715.

Brady, S. G., Schultz, T.R., Fisher, B.L. & Ward, P.S. 2006. Evaluating alternative hypotheses for the early evolution and diversification of ants. *Proc. Natl. Acad. Sci. USA* **103**: 18172–18177.

Chiotis, M., Jermiin, L.S. & Crozier, R.H. 2000 A molecular framework for the phylogeny of the ant subfamily Dolichoderinae. *Mol. Phylogenet. Evol*. **17**: 108−116.

Folmer, O., Black, M., Hoeh, W., Lutz, R. & Vrijenhoek, R. 1994. DNA primers for amplification of mitochondrial cytochrome c oxidase subunit I from diverse metazoan invertebrates. *Mol. Mar. Biol. Biotechnol.* **3**: 294−299.

Huelsenbeck, J.P. & Ronquist, F. 2001. MrBayes: Bayesian inference of phylogeny. *Bioinformatics* **17**: 754–755.

Lewis, P.O. 2001. A likelihood approach to estimating phylogeny from discrete morphological character data. *Syst. Biol.* **50**: 913–925.

Ronquist, F. & Huelsenbeck, J.P. 2003. MrBayes 3: Bayesian phylogenetic inference under mixed models. *Bioinformatics* **19**: 1572–1574.

Schultz, T.R. & Brady, S.G. 2008. Major evolutionary transitions in ant agriculture. *Proc. Natl Acad. Sci. USA* **105**: 5435–5440.

Simon, C., Frati, F., Beckenbach, A., Crespi, B., Liu, H. & Flook, P. 1994. Evolution, weighting, and phylogenetic utility of mitochondrial gene-sequences and a compilation of conserved polymerase chain-reaction primers. *Ann. Entomol. Soc. Am*. **87**: 651−701.

Ward, P.S. & Downie, D.A. 2005 The ant subfamily Pseudomyrmecinae (Hymenoptera: Formicidae): phylogeny and evolution of big−eyed arboreal ants. *Syst. Entomol.* **30**: 310−335.