

Supplementary material

Synonymisation of the male-based ant genus *Phaulomyrma* (Hymenoptera : Formicidae) with *Leptanilla* based upon Bayesian total-evidence phylogenetic inference

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Table S1. Summary statistics for ultra-conserved element (UCE) assemblies, computed with *BBMap* (ver. 38.87, see <https://sourceforge.net/projects/bbmap/files/>, accessed 13 November 2020)

Name	Designation in Borowiec <i>et al.</i> (2019)	Number of contigs	Summed length of assembly (bp)	N50	N90	L50	L90	Average GC content	σ of GC content
<i>Anomalomyrma boltoni</i>	<i>Anomalomyrma boltoni</i>	51209	16550563	16526	43480	305	213	0.37721	0.08768
<i>Leptanilla</i> GR01	<i>Leptanilla</i> GR01	134293	34974462	34397	91485	297	189	0.36889	0.0945
<i>Leptanilla</i> GR02	<i>Leptanilla</i> GR02	439863	119479855	146272	342814	277	213	0.38114	0.09382
<i>Leptanilla</i> GR03	N/A	47378	16187945	13779	39988	315	213	0.38152	0.08524
<i>Leptanilla revelierii</i>	N/A	332453	159087760	65854	225701	684	248	0.34938	0.09345
<i>Leptanilla</i> TH01	<i>Leptanilla</i> TH01	143170	49328952	41219	114791	345	223	0.37709	0.08697
<i>Leptanilla</i> zhg-au02	N/A	37696	11230899	13346	32560	278	210	0.36712	0.08169
<i>Leptanilla</i> zhg-bt01	N/A	24036	8209365	6797	20199	325	211	0.51253	0.15305
<i>Leptanilla</i> zhg-my02	N/A	29083	8093471	10637	25349	253	207	0.45969	0.15313
<i>Leptanilla</i> zhg-my03	N/A	135840	40596888	49744	117240	287	212	0.34573	0.08759
<i>Leptanilla</i> zhg-my04	N/A	97199	27855062	36949	83953	274	211	0.37833	0.08451
<i>Leptanilla</i> zhg-my05	N/A	32971	9257233	12219	28613	260	208	0.43481	0.13357
<i>Leptanilla</i> zhg-th01	N/A	33239	10202619	10895	28605	280	209	0.44404	0.13549
<i>Martialis heureka</i>	<i>Martialis heureka</i>	21898	7182777	6833	18548	306	212	0.42673	0.09453
<i>Noonilla</i> zhg-my02	N/A	40717	12375368	13740	34707	280	210	0.48044	0.14908
<i>Noonilla</i> zhg-my06	N/A	87940	25810809	32313	76300	280	211	0.39262	0.08704
<i>Opamyrra hungvuong</i>	<i>Opamyrra hungvuong</i>	43028	14068112	13049	36672	293	211	0.41626	0.09227
<i>Protanilla</i> TH01	<i>Protanilla</i> TH01	277546	158259023	52233	177893	885	281	0.34487	0.08609
<i>Protanilla</i> TH02	<i>Protanilla</i> TH02	41247	14443362	11980	34497	336	215	0.39614	0.08449
<i>Protanilla</i> TH03	<i>Protanilla</i> TH03	90659	31360316	26658	76212	319	215	0.37961	0.0854
<i>Protanilla</i> zhg-vn01	N/A	11698	3677118	3631	9940	294	209	0.47482	0.13845
<i>Yavnella argamani</i>	<i>Yavnella argamani</i>	73338	24265310	22835	61780	306	214	0.38836	0.07717
<i>Yavnella</i> cf. <i>indica</i>	N/A	47730	16020983	13716	40534	301	211	0.40009	0.08419
<i>Yavnella</i> MM01	<i>Phaulomyrma</i> MM01	22786	8481308	5869	18778	367	215	0.40151	0.07831
<i>Yavnella</i> TH02	<i>Leptanilla</i> TH02	324624	146839933	68079	218438	632	250	0.38804	0.07888
<i>Yavnella</i> TH03	<i>Leptanilla</i> TH03	150716	50271260	49837	127042	325	218	0.3814	0.07211
<i>Yavnella</i> TH04	<i>Leptanilla</i> TH04	82813	28957830	23726	69235	325	215	0.39026	0.0767
<i>Yavnella</i> TH05	<i>Leptanilla</i> TH05	371040	128697850	104811	287546	373	225	0.3895	0.091
<i>Yavnella</i> TH06	<i>Leptanilla</i> TH06	41727	15178567	11017	34612	345	215	0.40263	0.07657
<i>Yavnella</i> TH08	<i>Leptanilla</i> TH08	268680	105886168	65754	198127	472	235	0.3918	0.08449
<i>Yavnella</i> TH10	<i>Leptanilla</i> TH10	437111	154144723	118207	331079	391	227	0.38615	0.09271
<i>Yavnella</i> zhg-bt01	N/A	64815	22055158	18803	54745	320	212	0.47734	0.13026
<i>Yavnella</i> zhg-th01	N/A	75720	25114042	23038	63631	308	213	0.41802	0.09413

Table S2. Summary statistics for each of the 11 loci in the 9351-bp alignment, computed with IQ-Tree (ver. 1.6.10, see <http://www.iqtree.org/>; Nguyen *et al.* 2015) on the CIPRES Science Gateway (ver. 3.3; Miller *et al.* 2010)

Locus	Total sites	Constant sites	Parsimony-informative sites
28S rDNA	2204	1834	207
AbdA	603	411	148
EF2	517	338	149
LwRh, exon 1	226	131	68
LwRh, intron	143	34	68
LwRh, exon 2	232	122	85
Wg	412	243	138
AP	802	487	236
ArgK, exon 1	319	188	103
ArgK, intron	491	221	178
ArgK, exon 2	354	233	97
NaK	955	657	241
POLD1	583	350	179
Top1	880	525	284
Ubx	630	421	157

Table S3. Discrete character matrix including the 33 terminals for which male morphology is known

Designation in Borowiec <i>et al.</i> (2019)		Mesal protibial margins carinate	Ventral cuticular hook present on profemur	Row of ventral protibial bristles present	Head inclusive of compound eyes as wide or wider than long	Clypeus broader than torular diameter along medial axis	Anterior tentorial pit situated directly anterior to torulus	Antennomere 3 longer than scape	Mandible articulated to gena	Occipital margin angularly emarginate in dorsal view	Mesoscutum convex in profile view	Notauli present	Parapsidal suture present	Oblique mesopleural sulcus adjoining posterior mesopectal margin	Pterostigma present	Mesoscutellum densely pubescent	Mesoscutellar disc projecting posteriorly in profile view	Propodeal dorsum concave in profile view	Abdominal tergite II produced into distinct node	Abdominal sternite II with ventral process	Petiole higher than long including peduncle	Cinctus present on abdominal segment III	Cinctus present on abdominal segment IV	Abdominal sternite IX with posteromedian filiform process	Abdominal sternite IX with posterolateral filiform processes	Abdominal tergite XIII broader than long	Gonocoxae ventromedially fused along entire length	Gonocoxae dorsomedially fused along entire length	Gonocoxa with ventromesal lamina	Stylus articulated to gonocoxa	Gonopodial apex with vestiture	Gonopodial apex bifurcated	Penial sclerites enclosed dorsally by gonopodites at base	Penial sclerites dorsally recurved at base in profile view	Penial sclerites dorsoventrally compressed at base	Penial sclerites dorsoventrally compressed at apex	Lateral margins of penial sclerites laminate	Penial sclerites with dorsomedian carina	Penial sclerites with ventromedian projection	Phallosome flanked with vestiture	Phallosome preapical	Penial apex entire	Percentage complete				
<i>Yavnella</i> TH02	<i>Leptanilla</i> TH02	0	0	0	1	1	1	1	0	0	1	0	1	0	0	0	?	1	0	0	?	0	0	0	0	1	0	0	0	0	0	0	0	1	1	1	0	0	0	0	0	0	0	0	95		
<i>Yavnella</i> TH03	<i>Leptanilla</i> TH03	0	0	0	1	?	?	1	?	0	1	0	0	?	0	0	0	1	0	0	0	1	0	1	0	1	1	1	0	0	1	0	1	0	?	0	0	0	?	0	0	?	0	0	1	85	
<i>Yavnella</i> TH04	<i>Leptanilla</i> TH04	0	0	0	1	1	1	1	1	0	1	0	1	0	0	?	0	1	0	0	0	1	0	0	0	1	0	0	0	0	1	0	0	0	?	1	0	0	?	0	?	1	90				
<i>Yavnella</i> TH05	<i>Leptanilla</i> TH05	0	0	0	0	?	0	0	0	0	1	0	0	0	0	0	0	1	0	0	1	1	0	0	0	1	0	0	0	0	1	0	0	0	1	1	1	0	?	0	0	0	0	95			
<i>Yavnella</i> TH06	<i>Leptanilla</i> TH06	0	0	0	1	1	1	1	0	0	1	0	1	0	0	0	0	1	0	0	0	1	0	0	0	1	0	0	0	0	1	0	0	0	1	1	0	0	?	0	0	0	0	98			
<i>Yavnella</i> TH08	<i>Leptanilla</i> TH08	0	0	0	0	?	?	1	0	0	1	0	0	0	0	0	0	1	1	0	0	1	0	0	0	1	0	0	0	0	1	1	0	0	1	1	0	0	?	0	?	0	0	90			
<i>Leptanilla</i> GR01	<i>Leptanilla</i> GR01	0	0	0	0	?	0	0	1	0	0	0	1	0	0	0	0	0	1	1	0	1	0	0	0	1	0	0	1	1	1	0	0	0	1	1	1	0	1	1	0	1	0	0	1	98	
<i>Leptanilla</i> GR02	<i>Leptanilla</i> GR02	0	0	0	0	?	0	0	1	0	0	0	0	1	0	0	0	0	1	1	0	1	0	0	0	1	0	0	1	1	1	1	0	0	1	1	1	0	1	1	0	1	0	0	1	98	
<i>Leptanilla</i> GR03	N/A	0	0	0	0	?	0	0	1	0	0	0	0	0	?	0	0	0	1	1	0	1	0	0	0	1	0	0	0	1	1	0	0	0	1	1	1	0	0	0	0	0	1	95			
<i>Leptanilla</i> TH01	<i>Leptanilla</i> TH01	?	?	?	0	0	0	0	1	1	0	0	1	0	0	1	1	0	1	0	1	1	0	0	0	1	?	0	0	0	1	0	0	0	?	0	0	1	?	0	0	1	?	0	0	1	85
<i>Leptanilla</i> TH09	<i>Leptanilla</i> TH09	0	0	0	0	?	0	0	?	0	0	0	0	0	0	0	0	0	1	1	0	1	0	0	0	1	0	0	1	0	0	1	0	0	0	1	1	1	0	0	0	0	0	1	95		
<i>Leptanilla</i> ZA01	<i>Leptanilla</i> ZA02	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	0	?	1	1	1	1	0	0	1	1	1	0	0	0	0	0	0	37	
<i>Leptanilla</i> zhg-au02	N/A	0	0	0	0	?	?	?	?	?	0	0	?	?	?	0	0	0	0	0	0	0	0	0	?	1	0	?	1	1	1	0	1	0	1	1	?	0	1	1	?	0	1	0	0	1	78
<i>Leptanilla</i> zhg-bt01	N/A	0	0	0	0	?	0	0	1	0	0	0	0	0	0	0	0	0	0	1	1	0	1	0	0	1	0	?	?	?	?	?	0	0	1	1	0	0	1	0	0	1	0	0	1	85	
<i>Leptanilla</i> zhg-my02	N/A	0	1	1	0	0	?	0	1	1	0	0	1	0	0	1	0	0	1	1	1	1	0	0	1	1	1	1	1	0	0	1	1	0	0	1	1	0	0	1	0	0	1	1	1	98	
<i>Leptanilla</i> zhg-my03	N/A	0	0	1	0	0	0	0	1	0	0	0	1	0	0	1	0	0	1	0	1	1	0	0	1	1	1	1	0	0	0	1	0	0	1	0	0	1	0	0	0	0	1	1	10		
<i>Leptanilla</i> zhg-my04	N/A	0	0	1	1	0	0	0	1	1	0	1	0	0	1	0	0	1	0	0	1	0	0	1	1	1	1	1	0	0	1	0	0	1	0	0	0	1	0	0	0	1	0	0	1	10	
<i>Leptanilla</i> zhg-my05	N/A	0	1	1	0	0	0	0	1	1	0	0	1	0	0	1	0	0	1	1	1	1	0	0	1	1	?	1	1	0	0	1	1	0	0	1	1	0	0	1	0	1	0	1	1	98	
<i>Leptanilla</i> zhg-th01	N/A	0	0	0	0	?	0	1	1	1	0	0	0	?	1	1	0	1	0	0	1	0	0	0	1	0	0	1	0	0	1	1	0	0	0	0	0	0	0	0	0	1	0	0	1	95	
<i>Martialis</i> heureka	<i>Martialis</i> heureka	0	0	0	0	1	1	0	1	0	1	1	1	0	1	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0	1	0	1	1	?	0	0	0	0	0	1	0	0	1	98
<i>Noonilla</i> zhg-my02	N/A	1	0	0	1	0	0	0	1	0	0	0	0	0	?	0	0	0	0	0	0	0	0	0	0	0	?	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	95	
<i>Noonilla</i> zhg-my06	N/A	1	0	0	1	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	?	0	1	1	0	?	0	?	0	0	0	0	0	0	1	1	0	93		
<i>Opamyrm</i> a hungvuon g	<i>Opamyrm</i> a hungvuon g	0	0	0	1	1	1	?	1	0	1	1	1	1	1	0	0	0	0	1	0	0	1	0	0	0	0	1	1	0	1	1	0	0	0	?	?	0	0	0	0	0	0	0	0	93	
<i>Phaulomy</i> rma javana	N/A	0	0	0	0	0	?	0	?	0	0	0	0	1	0	0	0	0	1	0	0	1	0	0	0	?	?	?	?	1	1	0	?	0	?	1	0	0	0	0	?	1	80				
<i>Yavnella</i> MM01	<i>Phaulomy</i> rma MM01	0	0	0	0	?	0	1	?	0	1	0	1	0	0	0	0	0	1	0	0	1	1	0	0	?	?	0	0	0	1	0	0	0	1	1	1	0	?	?	?	?	1	83			
<i>Protanilla</i> TH01	<i>Protanilla</i> TH01	0	0	0	1	1	0	0	1	0	1	0	0	1	1	0	0	0	1	?	1	1	0	0	0	1	?	0	?	0	1	0	0	0	0	0	0	0	0	0	?	0	0	0	93		
<i>Protanilla</i> TH02	<i>Protanilla</i> TH02	0	0	0	1	1	1	0	1	0	1	1	0	1	1	0	0	0	1	1	1	1	0	0	0	1	0	0	0	0	1	0	0	0	0	?	?	0	0	?	0	?	0	90			

Designation in Borowiec <i>et al.</i> (2019)		Mesal protibial margin carinate	Ventral cuticular hook present on profemur	Row of ventral protibial bristles present	Head inclusive of compound eyes as wide or wider than long	Clypeus broader than tonular diameter along medial axis	Anterior tentorial pit situated directly anterior to tonulus	Antennomere 3 longer than scape	Mandible articulated to gena	Occipital margin angularly emarginate in dorsal view	Mesoscutum convex in profile view	Notauli present	Parapsidal suture present	Oblique mesopleural sulcus adjoining posterior mesospectal margin	Pterostigma present	Mesoscutellum densely pubescent	Mesoscutellar disc projecting posteriorly in profile view	Propodeal dorsum concave in profile view	Abdominal tergite II produced into distinct node	Abdominal sternite II with ventral process	Petiole higher than long including peduncle	Cinctus present on abdominal segment III	Cinctus present on abdominal segment IV	Abdominal sternite IX with posteromedian filiform process	Abdominal sternite IX with posterolateral filiform processes	Abdominal tergite XIII broader than long	Gonocoxae ventromedially fused along entire length	Gonocoxae dorsomedially fused along entire length	Gonocoxa with ventromesal lamina	Stylus articulated to gonocoxa	Gonopodial apex with vestiture	Gonopodial apex bifurcated	Penial sclerites enclosed dorsally by gonopodites at base	Penial sclerites dorsally recurved at base in profile view	Penial sclerites dorsoventrally compressed at base	Penial sclerites dorsoventrally compressed at apex	Lateral margins of penial sclerites laminate	Penial sclerites with dorsomedian carina	Penial sclerites with ventromedian projection	Phallorema flanked with vestiture	Phallorema preapical	Penial apex entire	Percentage complete	
<i>Protanilla</i> TH03	<i>Protanilla</i> TH03	0	0	0	1	1	1	1	1	0	1	1	0	1	1	0	0	0	0	0	0	1	1	0	0	1	0	0	0	0	0	0	0	?	0	0	?	?	1	?	1	90		
<i>Protanilla</i> zhg-vn01	N/A	0	0	0	1	1	1	0	1	0	1	0	1	1	1	0	0	0	1	1	1	1	0	0	0	1	0	0	0	1	1	0	0	0	0	0	0	?	0	0	?	0	1	98
<i>Yanella argamani</i>	<i>Yanella argamani</i>	0	0	0	1	1	1	0	0	1	0	1	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0	0	0	0	1	0	0	0	1	1	1	0	0	0	0	0	10	
<i>Yanella</i> cf. <i>indica</i>	N/A	0	0	0	1	?	1	1	0	0	1	0	0	0	0	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	1	0	1	0	?	1	0	0	0	0	?	1	93	
<i>Yanella</i> zhg-b01	N/A	0	0	0	1	1	1	1	0	0	1	0	1	0	0	0	0	1	0	0	1	0	0	0	1	0	0	0	0	0	1	0	1	0	1	1	1	0	0	0	0	1	10	
<i>Yanella</i> zhg-th01																																											0	

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