

Supplementary Table 1. Four cluster likelihood mapping (FcLM) results for each locus in the nucleotide and amino acid datasets. Numbers indicate the weight of support for each topology, drawn from the corners of the respective FcLM triangle as depicted in Figure 2C.

Locus	Nucleotides			Amino acids		
	Tree 1	Tree 2	Tree 3	Tree 1	Tree 2	Tree 3
EOG5TQKR2	3.06	0.00	1.28	1.53	4.34	1.02
EOG5NZT8G	11.73	8.67	12.24	2.81	21.43	3.57
EOG5PRS5K	2.55	1.79	0.00	3.32	2.81	0.26
EOG5K3KB5	13.01	9.69	21.94	10.46	8.93	25.26
EOG5FFCGQ	4.34	3.57	3.06	0.00	0.00	0.00
EOG53XTK2	1.53	4.08	0.00	0.00	0.26	0.00
EOG5TF00J	0.00	6.89	6.12	0.00	13.52	4.34
EOG5TQKQK	0.00	0.00	1.02	0.00	0.77	0.00
EOG5CNQ5Z	0.00	0.00	1.79	0.00	0.00	1.02
EOG5PVND6	0.77	0.00	6.89	1.79	8.93	0.26
EOG569Q8B	3.06	15.31	0.51	0.26	14.03	0.26
EOG51G2JK	0.00	1.02	0.00	0.77	0.26	0.00
EOG5D7XM5	0.00	0.00	0.00	0.00	0.00	0.00
EOG5D52CG	0.00	20.66	5.36	0.00	0.00	0.00
EOG5MKMWR	0.00	0.00	0.00	0.00	0.00	0.00
EOG579DNP	17.86	0.00	5.10	20.92	0.00	1.28
EOG5WM488	29.34	0.00	1.02	13.52	8.93	0.26
EOG5F4RRN	59.18	0.00	7.14	6.12	11.99	30.36
EOG5W9HJ6	0.00	1.79	0.26	0.26	0.51	0.77
EOG5T77J0	0.77	0.00	0.77	0.00	0.77	0.51
EOG5H45J5	22.19	0.26	1.53	35.46	0.26	0.00
EOG5QNMBF	17.35	0.00	13.52	9.69	0.51	7.65
EOG5G1KXJ	0.51	3.32	4.34	0.51	11.73	3.06
EOG58WBGN	25.77	0.77	26.02	11.22	0.26	42.35
EOG5D52CT	34.44	0.26	16.58	15.56	2.55	23.72
EOG57WN4J	0.51	9.18	9.18	0.00	0.00	2.04
EOG5F4RS1	0.77	15.05	7.14	0.00	0.00	4.59
EOG5XWFC2	1.79	0.00	26.53	1.02	1.02	2.04
EOG5N8QKK	0.00	0.00	2.81	1.28	1.02	1.02
EOG5CVFN6	2.30	0.26	1.79	0.00	3.32	0.00
EOG5ZCSM2	0.00	0.00	2.55	0.00	0.00	0.77
EOG5NGG3B	1.53	0.77	7.40	0.00	0.00	0.51
EOG5QJR3X	7.14	0.00	2.81	2.30	3.06	1.79
EOG5H71S9	14.54	0.51	1.28	16.07	7.65	0.00
EOG5D264K	11.22	8.16	0.00	5.61	0.26	3.32
EOG59P9CQ	0.00	2.55	1.02	0.26	3.32	0.00
EOG5DFP34	7.65	21.68	0.00	15.31	0.00	5.36
EOG55DW3V	12.76	0.26	5.36	3.83	1.79	3.06
EOG5HMHQW	5.61	0.51	6.38	6.89	4.34	1.79
EOG5B2SBH	0.51	0.51	13.52	0.26	0.26	0.00
EOG5S4NWP	36.48	6.63	9.95	26.28	24.74	3.32
EOG53JBKM	7.91	0.26	6.12	3.83	0.77	0.00
EOG5MCWFV	0.26	0.51	2.30	0.51	2.30	0.26
EOG57H54M	2.30	4.34	10.97	3.32	27.81	6.12
EOG5613JR	3.57	0.77	4.85	0.26	3.32	0.00
EOG5CJTZP	0.00	0.26	1.02	0.00	0.00	1.02
EOG5B5NKP	7.14	3.57	14.03	1.79	9.44	17.35
EOG5KSP0S	2.30	8.42	7.65	8.93	1.02	6.38
EOG5867TF	0.51	0.77	4.34	1.28	0.26	0.77
EOG52Z455	1.02	0.00	1.02	0.00	1.02	0.00
EOG5SF8MC	0.26	0.26	0.00	0.00	1.02	0.51
EOG5C5C0F	2.55	1.28	2.55	1.28	0.00	0.51
EOG5M0DGB	36.22	2.30	3.83	42.60	0.51	0.26
EOG566VIN	38.27	9.18	10.97	8.93	13.01	6.89
EOG5K0Q36	6.12	0.51	11.22	0.00	11.48	0.00
EOG59S5MN	0.00	0.00	2.81	1.02	0.00	1.53
EOG5SJ4W6	0.00	0.00	5.10	0.26	0.00	2.30
EOG55X79N	0.26	3.57	0.00	0.26	0.00	1.02

EOG5Z8XB2	0.77	1.28	0.00	1.79	0.00	0.51
EOG5QNMBP	1.53	0.77	0.00	0.00	0.00	1.28
EOG5B2SC7	2.30	22.45	1.79	6.38	5.87	9.44
EOG537QV9	2.30	0.51	3.57	1.02	2.55	1.79
EOG5SXXMTK	14.03	0.26	2.30	1.79	5.36	0.51
EOG5N5VB5	39.80	0.00	1.02	34.95	0.00	1.28
EOG5VT5BN	8.67	0.00	0.00	0.00	0.00	0.00
EOG5FR06B	15.31	15.56	6.12	4.08	16.07	6.38
EOG5CRKDT	9.95	0.00	24.23	2.30	14.54	6.12
EOG51C6BC	0.00	0.51	6.89	0.26	1.53	3.83
EOG5NVZOW	0.00	0.77	0.00	0.00	0.00	0.00
EOG5NS2S7	13.01	0.00	0.51	1.28	0.26	10.20
EOG57H549	33.93	0.00	0.26	19.90	0.51	2.81
EOG5GB6MF	6.38	0.51	0.51	0.00	0.77	0.00
EOG5CJTXQ	0.51	1.28	13.78	0.00	0.51	1.02
EOG5TB3S4	0.51	13.78	1.28	1.53	5.87	2.30
EOG5QNM9P	9.95	14.03	16.84	3.06	13.27	5.61
EOG544K1F	2.81	1.02	43.11	0.26	0.00	24.49
EOG5C2GQS	0.00	0.77	0.26	1.28	0.51	1.28
EOG5GQPK7	4.34	0.51	7.40	7.14	0.00	2.04
EOG58PM0Q	0.51	0.00	15.05	4.08	0.26	2.30
EOG5DNDJQ	1.28	0.00	34.18	0.77	0.00	4.08
EOG5MPH4N	32.14	0.00	0.77	10.20	0.00	0.00
EOG5TMQGH	9.18	5.36	4.85	0.51	19.90	0.00
EOG5BK4JN	4.85	9.44	23.21	0.26	18.37	0.51
EOG54B9H7	0.00	0.51	3.32	0.51	1.02	0.00
EOG5906QQ	1.02	0.26	7.40	3.06	7.65	2.30
EOG5ZW4RP	5.36	8.16	5.36	5.61	6.89	1.79
EOG56Q671	4.59	1.53	26.79	19.64	2.55	2.04
EOG5ZS8HD	4.59	0.26	6.89	1.53	5.87	9.18
EOG5XGZDH	0.00	0.00	0.51	0.00	0.51	0.77
EOG52FRZD	0.77	3.32	3.83	0.00	1.53	0.26
EOG5BP0SM	0.00	0.00	1.02	0.51	0.00	0.26
EOG547F7K	0.26	5.61	2.30	0.00	1.02	0.00
EOG56DKH2	2.55	1.02	0.00	0.51	0.26	0.00
EOG5S1SNF	4.85	4.08	15.56	0.77	4.85	12.24
EOG5XXKTPC	0.00	1.79	0.77	0.00	3.06	0.77
EOG5V6XXK	3.83	0.00	0.00	4.08	0.00	0.00
EOG502W6J	0.00	1.02	3.83	0.26	1.53	4.59
EOG5TB3S9	18.11	12.24	2.30	0.00	9.18	0.00
EOG5NS2RV	7.65	3.32	0.00	0.00	4.59	0.00
EOG537QV6	5.87	0.00	0.26	4.08	0.00	5.10
EOG5H9X0R	27.55	7.40	1.02	14.80	6.12	7.14
EOG505RFV	0.77	0.00	40.56	13.01	1.02	8.93
EOG5FBH7K	0.51	4.08	49.49	0.00	0.00	34.44
EOG5H45JR	3.06	0.00	13.01	0.00	0.00	0.00
EOG5N8QKR	4.08	2.81	4.85	0.77	0.26	0.00
EOG5SBDC9	4.59	0.00	14.29	0.00	0.51	20.41
EOG5X0M7K	44.90	0.00	15.56	16.84	4.08	16.58
EOG5TB3RP	0.00	15.82	6.89	0.00	3.32	4.85
EOG537QVV	0.00	0.26	0.26	0.26	0.00	1.28
EOG5GXF20	0.00	1.02	0.77	0.00	2.30	0.77
EOG58D09D	0.51	2.04	2.04	0.26	1.02	1.02
EOG576JDX	0.00	33.16	0.00	0.00	20.41	0.51
EOG5HDS82	1.28	7.65	0.77	0.51	6.12	0.77
EOG579DND	0.00	0.77	9.18	0.00	0.00	0.51
EOG58SG8D	4.08	1.53	26.79	0.00	12.24	1.02
EOG5VT5BX	6.38	1.02	5.61	0.26	8.42	5.10
EOG5HT86M	0.00	0.00	0.00	0.00	0.00	0.00
EOG5ZCSJV	0.00	0.00	0.00	0.00	0.00	0.00
EOG5FJ7Q6	5.61	1.53	1.28	3.06	2.81	0.77
EOG5GXF31	6.12	0.00	0.00	5.10	0.26	0.00
EOG5KWJ7B	0.00	0.51	2.81	0.00	3.32	3.83
EOG5MCWFG	0.00	0.26	5.36	0.00	0.00	2.55

EOG5P5JR0	16.84	0.00	4.85	9.95	7.14	2.04
EOG5V9T5B	14.54	3.06	28.57	1.53	1.53	1.28
EOG5F7N0Q	5.61	0.77	4.59	0.77	13.27	0.00
EOG5MPH4K	67.09	0.00	0.26	43.88	5.36	0.00
EOG59W1VP	0.51	0.00	5.61	0.00	0.00	0.00
EOG5B5NMC	0.26	1.28	3.06	1.02	0.51	1.79
EOG5ZPD9R	17.35	0.00	17.35	9.69	2.30	3.32
EOG5K0Q34	20.66	0.00	0.00	4.08	2.55	3.83
EOG5G7BD3	10.20	13.01	0.00	2.04	1.02	0.00
EOG57D8WM	0.51	31.63	13.01	2.04	1.02	1.02
EOG5Z09MX	0.51	0.26	33.42	0.00	0.00	44.39
EOG5PC973	4.08	9.95	12.50	0.51	20.41	0.00
EOG5TQKQB	0.00	0.00	0.00	0.00	0.00	0.00
EOG5WSVQV	1.79	1.79	38.52	7.40	3.83	6.89
EOG5V9T52	2.55	11.22	20.41	3.57	15.56	4.08
EOG5DJJ9P	0.00	1.28	9.18	0.00	1.02	0.51
EOG5BK4JH	5.36	4.34	29.08	8.93	3.06	1.02
EOG570SZJ	5.36	2.04	23.98	0.00	0.00	0.00
EOG5F4RR9	0.51	11.22	0.00	0.00	4.59	0.26
EOG5M0DGP	0.00	8.16	7.40	0.00	1.02	0.26
EOG5Z09M6	35.20	0.00	3.83	23.98	4.08	5.10
EOG5WH81N	0.00	3.83	4.34	0.00	1.02	0.51
EOG5932ZR	4.85	7.14	2.55	6.89	7.65	0.77
EOG5N8QKB	2.81	0.26	7.40	0.00	0.26	7.14
EOG56DKHG	10.46	0.77	1.79	0.00	0.00	1.28
EOG5BCD2C	1.02	13.01	13.78	0.00	1.79	32.40
EOG5H45JB	19.90	10.46	6.63	0.77	31.38	2.81
EOG52RCP4	1.53	0.00	8.42	3.06	0.26	0.00
EOG58D08X	3.57	2.55	7.40	5.10	3.83	1.53
EOG534VMT	5.87	2.04	1.79	6.89	4.08	1.53
EOG5XGZF6	0.51	0.00	9.18	8.16	0.26	0.26
EOG54TNPC	2.55	9.95	2.30	0.51	0.26	3.32
EOG53R323	1.28	0.00	8.42	0.51	0.51	0.00
EOG5MGRNX	40.05	0.00	0.26	0.51	8.93	1.53
EOG55MMMJ	2.55	0.26	3.83	8.93	0.00	2.30
EOG5QVBS9	5.36	1.53	0.00	0.77	2.81	0.00
EOG5GMTB8	14.80	1.28	18.62	2.04	2.55	8.93
EOG54QSFX	0.00	0.00	0.00	0.00	0.00	0.00
EOG58D091	3.32	4.34	19.90	3.32	2.81	14.80
EOG5M0DGF	0.26	4.08	5.36	0.00	0.00	0.00
EOG5H1993	0.00	1.02	25.77	0.26	10.20	5.10
EOG5932ZW	14.03	6.12	5.10	11.73	2.81	7.40
EOG59W1WD	2.04	0.00	5.87	2.04	0.00	1.53
EOG5JM741	13.27	0.26	0.00	15.31	0.00	0.00
EOG505RFC	0.00	3.57	3.83	0.00	4.08	4.85
EOG56Q680	0.00	3.32	0.00	0.00	1.79	0.26
EOG52FRZ4	0.00	11.99	6.38	0.26	0.00	0.00
EOG5STRJV	0.00	3.06	6.12	0.77	0.00	0.00
EOG537QVC	42.35	2.55	0.00	24.74	3.32	1.28
EOG5KSP16	0.00	0.00	19.13	0.00	7.65	0.00
EOG50K7DN	0.51	0.51	0.26	0.26	1.02	0.00
EOG5KWJ7D	2.81	1.79	0.51	0.26	1.79	0.00
EOG5WSVR9	2.55	1.79	6.38	5.61	2.55	7.91
EOG5CC3FR	22.19	0.00	10.20	15.05	0.00	6.38
EOG5S7J52	1.02	0.00	2.81	2.04	0.00	1.02
EOG52NHFB	0.26	0.00	14.03	2.04	0.26	5.61
EOG57WN2Z	0.51	7.40	3.83	4.08	4.34	0.00
EOG5H45JJ	0.51	0.51	4.85	1.02	1.79	2.30
EOG52557T	0.00	0.51	4.85	0.00	0.26	5.36
EOG5N03VM	13.27	6.12	19.13	2.55	1.79	5.10
EOG5H45J4	0.26	22.96	11.73	0.00	4.08	3.57
EOG5CZ9W7	0.00	0.00	0.51	0.00	0.00	1.02
EOG5QFVV8	5.10	0.00	0.00	0.26	1.28	0.00
EOG5JQ3CW	3.57	0.00	25.51	6.38	5.36	0.00

EOG512KKQ	0.00	0.00	0.00	0.00	0.00	0.00
EOG5TF00X	11.22	0.26	3.06	8.93	2.81	2.30
EOG5MW7NS	0.00	0.00	0.26	0.00	0.00	0.00
EOG5GHZ50	0.00	0.26	1.28	0.26	1.02	0.00
EOG5CFZPM	4.59	0.26	6.12	1.28	5.10	0.77
EOG5FJ7QC	43.62	2.81	0.77	14.54	25.51	0.00
EOG5QRGJW	11.99	0.26	3.32	11.48	0.51	3.83
EOG5B2SC9	2.55	0.77	4.34	0.00	0.00	0.00
EOG5ZW4S8	2.81	0.00	0.77	0.00	0.00	0.00
EOG5613JQ	6.38	0.00	21.94	8.42	0.00	21.17
EOG5SBDCE	0.26	2.04	9.69	0.51	0.00	15.05
EOG53JBKN	8.93	1.28	10.20	0.00	46.68	0.00
EOG5MW7N4	7.40	3.06	4.85	8.67	3.06	2.81
EOG5STRKP	1.28	0.00	8.93	0.00	0.00	6.12
EOG544K11	0.00	1.53	0.00	0.00	0.00	0.00
EOG576JDJ	0.00	4.85	22.70	0.77	4.59	15.05
EOG5FN3ZD	0.26	0.00	3.32	0.26	0.51	2.04
EOG5Q2CWF	0.00	0.00	0.00	0.00	0.00	0.00
EOG5VDPDK	0.00	1.28	2.04	0.00	0.00	0.26
EOG5N303B	13.52	4.08	10.71	1.53	17.86	2.55
EOG5Q2CW8	15.56	0.00	3.83	1.02	1.53	13.27
EOG5XD35K	2.04	1.53	9.69	2.30	1.28	2.30
EOG5PZHN3	0.00	0.00	0.00	0.00	0.00	0.00
EOG55X79S	5.61	30.10	16.58	2.30	38.27	2.30
EOG566VIM	3.06	15.31	32.40	8.16	33.16	12.50
EOG5X0M7G	3.57	0.00	0.00	0.00	0.00	2.04
EOG5V9T6D	0.00	1.02	5.87	0.00	0.00	0.00
EOG5JDGP4	1.28	3.06	22.45	1.02	8.67	5.36
EOG57H54C	7.65	0.51	25.51	7.14	0.77	0.00
EOG5SXMTQ	13.78	7.65	8.42	0.00	0.00	0.00
EOG53N6T1	60.20	0.00	0.77	0.00	0.00	5.10
EOG5MSCCT	1.53	5.36	10.97	2.30	4.85	7.40
EOG57D8WW	2.81	3.06	0.26	0.26	3.57	0.51
EOG5T77J3	0.51	1.28	13.01	2.04	1.53	1.28
EOG5SXMSZ	0.00	4.08	1.79	0.00	2.81	5.61
EOG58KQS5	0.26	3.32	3.32	0.00	2.04	3.06
EOG547F7G	0.00	2.81	10.71	0.00	2.81	11.73
EOG5CVFNX	10.97	4.34	14.54	5.10	9.18	5.10
EOG5M9161	23.47	0.00	0.00	24.49	0.00	0.00
EOG5MSCCJ	10.71	0.26	7.65	1.02	9.69	2.55
EOG58SG83	0.26	0.51	1.28	1.02	0.00	2.30
EOG5KKXHM	0.26	0.00	0.77	0.26	2.81	0.00
EOG52JN6W	0.77	1.02	5.36	0.00	2.04	3.32
EOG50RZW2	0.77	3.32	16.84	5.10	11.73	13.27
EOG5CNQ63	4.34	1.28	1.28	0.26	0.00	0.00
EOG5G1KWX	1.02	1.28	0.26	1.53	1.53	0.26
EOG5N03VQ	5.36	0.26	17.09	5.10	0.77	9.95
EOG52V7X3	0.00	0.00	1.53	0.00	0.00	0.77
EOG52BWR9	0.00	0.00	0.00	0.00	0.00	0.00
EOG5R2384	0.26	14.29	6.89	6.89	0.77	1.02
EOG53JBKK	14.80	1.79	2.81	0.00	7.91	16.84
EOG52V7XM	0.51	0.26	0.00	0.00	0.00	0.00
EOG5574NG	0.00	2.30	2.55	1.02	0.00	3.06
EOG5Q584J	0.26	3.06	5.10	1.28	3.83	2.55

Supplementary Table 2. Divergence times estimates (including mean ages and ranges) and branch support values for the nodes depicted in Supplementary Figure 9. PP = posterior probability.

Node	Mean	Inferior 95%	Superior 95%	PP	Crown clade
1	167.85	155.9	186.54	-	
2	161.71	155.7	173.92	1	Acroceridae
3	75.8	47.53	104.09	1	<i>Carvalhoa+Acrocera</i>
4	33.11	22.7	44.4	1	<i>Acrocera</i>
5	24.2	16.14	32.56	1	<i>Acrocera</i>
6	20.75	13.3	28.4	1	<i>Acrocera</i>
7	14.36	8.66	20.76	1	<i>Acrocera</i>
8	11.47	6.2	17.57	1	<i>Acrocera</i>
9	128.47	108.02	146.43	1	Acroceridae part
10	33.47	24	45.9	0.23	<i>Ogcodes</i>
11	20.44	9.63	30.82	0.54	<i>Ogcodes</i>
12	30.04	19.96	39.53	0.35	<i>Ogcodes</i>
13	114.25	96.68	131.26	0.99	Acroceridae part
14	87.82	71.86	103.68	1	Philopotinae
15	41.41	34	53.06	0.85	<i>Parahelle+Terphis</i>
16	30.18	21.82	38.13	0.84	<i>Parahelle+Terphis</i>
17	24.79	16.66	32.99	0.97	<i>Parahelle+Terphis</i>
18	13.66	7.02	20.59	1	<i>Parahelle+Terphis</i>
19	67.99	54.55	81.51	1	Philopotinae part
20	20.94	13.22	29.3	0.98	<i>Megalybus</i>
21	13.19	6.72	20.74	1	<i>Megalybus</i>
22	51.63	39.94	63.99	1	<i>Oligoneura+Philopota</i>
23	39.29	34	47.32	0.18	<i>Oligoneura+Philopota</i>
24	23.05	13.88	31.5	0.97	<i>Oligoneura+Philopota</i>
25	97.61	81.82	113.78	1	Acroceridae part
26	43.29	34.69	69.85	0.87	<i>Turbopsebius+Cyrtus</i>
27	83.37	68.91	98.21	1	Acroceridae part
28	68.49	53.66	84.15	1	<i>Psilodera+Pterodontia</i>
29	27.29	15.01	41.76	1	<i>Psilodera</i>
30	11.34	5.74	18.37	1	<i>Pterodontia</i>
31	71.43	58.43	85.09	1	Panopinae
32	43.31	31.92	55.45	1	Panopinae part
33	26.36	17	36.38	1	<i>Lasia</i>
34	21.78	13.05	31.43	1	<i>Lasia</i>
35	30.44	20.29	41.26	1	<i>Panops+Eulonchus</i>
36	15.62	9.27	22.66	1	<i>Eulonchus</i>
37	5.76	2.92	8.85	1	<i>Eulonchus</i>
38	57.11	45.37	69.85	1	Panopinae part
39	42.25	32.21	52.54	1	Panopinae part
40	31.05	22.94	39.42	1	<i>Exetasis+Ocnaea</i>
41	25.84	17.94	34.38	1	<i>Exetasis+Ocnaea</i>
42	25.26	17.92	33.63	1	<i>Exetasis+Ocnaea</i>
43	13.41	7.4	20.03	1	<i>Exetasis+Ocnaea</i>

Supplementary Table 3. Acroceridae fossil taxa included in the fossilized birth-death divergence time analyses.

Fossil species	Placement	Age (Ma)	Reference
<i>Archocyrtus gibbosus</i>	stem Acroceridae	155.7	Ussatchev 1968, Gillung & Winterton 2017
<i>Archocyrtus kovalevi</i>	stem Acroceridae	155.7	Nartshuk 1996, Gillung & Winterton 2017
<i>Schlingeromyia minuta</i>	crown Acroceridae	94.3	Grimaldi <i>et al.</i> 2011, Gillung & Winterton 2017
<i>Cyrtinella flavinigra</i>	stem <i>Cyrtus</i> + <i>Turbopsebius</i>	33.9	Gillung & Winterton 2017
<i>Glaesoncodes completinervis</i>	stem <i>Ogcodes</i>	33.9	Hennig 1968
<i>Villalites electrica</i>	stem <i>Cyrtus</i> + <i>Turbopsebius</i>	33.9	Hennig 1966
<i>Ogcodes exotica</i>	crown <i>Ogcodes</i>	13.6	Grimaldi 1995
<i>Archaeterphis hennigi</i>	crown Philopotinae	33.9	Hauser & Winterton, 2007, Gillung & Winterton 2017
<i>Eulonchiella eocenica</i>	crown Philopotinae	33.9	Gillung & Winterton 2011
<i>Hoffeinsomyia leptogaster</i>	crown Philopotinae	33.9	Gillung & Winterton 2017
<i>Prophilopota succinea</i>	crown Philopotinae	33.9	Hennig 1966
<i>Prophilopota variegata</i>	crown Philopotinae	33.9	Gillung & Winterton 2017

Supplementary Table 4. Taxa used in this study (Bioproject PRJNA325838), including NCBI Accession numbers (SRA = Sequence Read Archive). ANIC = Australian National Insect Collection, Canberra, Australia; CSCA = California State Collection of Arthropods, Sacramento, CA, USA; MZSP = Museu de Zoologia da Universidade de Sao Paulo, Sao Paulo, Brazil; NCSU = North Carolina State University Insect Museum; ZFMK = Zoological Research Museum Alexander Koenig, Bonn, Germany.

Family	Taxon	Geographical origin	SRA Accession number	Voucher specimens
Acroceridae	Acrocera sp. CSCA acro02	Portugal: Nove de Santo Antonio	SRR6453549	CSCA
	Acrocera sp. CSCA acro04	Thailand	SRR6453548	CSCA
	Acrocera sp. CSCA acro51	Argentina: Salta Province	SRR6453539	CSCA
	Acrocera sp. CSCA acro53	USA: Utah, Juba Co., Little Sahara Recreational Area	SRR6453538	CSCA
	Acrocera sp. CSCA acro54	USA: Arizona, Rima Co., Vail Mountain Creek Ranch	SRR6453543	CSCA
	Acrocera sp. CSCA acro55	USA: Colorado, Jackson Co., North Delaney Bute Lake	SRR6453542	CSCA
	Arrhynchus penai	Chile: Quillota Prov., Palma de Ocoa, Parque Nacional Campanas	SRR6453526	CSCA
	Carvalhoa appendiculata	Chile: Province Curico, Curico	SRR6453547	CSCA
	Cyrtus gibbus	Portugal: Nove de Santo Antonio	SRR6453546	CSCA
	Eulonchus sapphirinus	USA: California, Nevada City	SRR6453528	CSCA
	Eulonchus smaragdinus	USA: California, Del Puerto Canyon	SRR6453531	CSCA
	Eulonchus tristis	USA: California, Del Norte Co., Six Rivers N.F.	SRR6453529	CSCA
	Exetasis sp. CSCA acro26	Peru: Depto. Loreto, Mariano Melgar	SRR6453530	CSCA
	Lasia aenea	Chile: Region VIII, Biobio, Prov. Nuble, Las Trancas	SRR6453532	CSCA
	Lasia colei	Panama: San Lorenzo Forest	SRR6453533	CSCA
	Megalybus crassus	Argentina: Neuquen Prov., P.N. Lanin	SRR6453557	CSCA
	Megalybus obesus	Argentina: Neuquen Prov., Estancia Mamuil Malal Lolen	SRR6453559	CSCA
	Megalybus sp. CSCA acro39	Chile: Region IV, Limari, Bosque Fray Jorge N.P.	SRR6453558	CSCA
	Ocnaea loewi	Mexico: Sonora, 30 km E Los Alamos, Rancho Fundicion	SRR6453524	CSCA
	Ocnaea micans	USA: Arizona, Santa Cruz Co., Sonoita	SRR6453561	CSCA
	Ocnaea sp. CSCA acro31	Peru: Ancash Region, Pampamarca	SRR6453560	CSCA
	Ocnaea sp. MZSP OD358	Brazil: Minas Gerais, Brumadinho	SRR6453562	MZSP
	Ogcodes sp. CSCA acro13	Hungary: Verteskozma	SRR6453553	CSCA
	Ogcodes sp. CSCA acro14	Peru: Ancash Region, Pampamarca	SRR6453552	CSCA
	Ogcodes sp. CSCA acro15	Australia: Queensland, Barakula SF	SRR6453551	CSCA
	Ogcodes sp. CSCA acro59	Spain: Aragon, 6km SW of Formigal	SRR6453564	CSCA
	Oligoneura aenea	China: Zhejian Prov., Qingliangfeng Nature Reserve, Shunxizhen	SRR6453555	CSCA
	Oligoneura nigroaenea	Japan: Nagano Prov., Ueda, near SMRC, Sugadaira Kogen	SRR6453537	CSCA
	Panops auricoma	Brazil: Sao Paulo, Santo Andre, Reserva Paranapiacaba	SRR6453525	MZSP
	Panops baudini	Australia: Western Australia, W of Norseman	SRR6453556	CSCA
	Parahelle sp. CSCA acro50	Madagascar: Fianarantsoa Prov., Ranomafana N.P.	SRR6453540	CSCA
	Parahelle stuckenbergi	Madagascar: Fianarantsoa Province, 12Km W of Ranomafana	SRR6453541	CSCA
	Philopota flavolateralis	French Guiana: Regina, Kaw, Kaw Montains	SRR6453554	CSCA
	Philopota liturata	Brazil: Sao Paulo, Salesopolis, Estacao Ecologica Boraceia	SRR6453565	MZSP
	Pialea capitella	Peru: Ancash Region, Pampamarca	SRR6453563	CSCA
	Psilodera fasciata	South Africa: Western Cape, Riverhuis Farm	SRR6453550	CSCA
	Psilodera nhluzane	South Africa: KwaZulu-Natal, Karkloof	SRR6453545	CSCA
	Pterodontia flavipes	USA: California, Marin Co., Mill Valley	SRR6453527	CSCA

	<i>Pterodontia melli</i>	Australia: Canberra, Australian Capital territory	Unpublished (Pmelli_1Kite)	ANIC
	<i>Thyllis compressa</i>	South Africa: Western Cape, S Clanwillian	SRR6453536	CSCA
	<i>Thyllis</i> sp. CSCA acro48	Madagascar: Fianarantsoa Province, 12Km W of Ranomafana	SRR6453534	CSCA
	<i>Thyllis splendens</i>	Madagascar: Fianarantsoa Prov., Ranomafana N.P.	SRR6453535	CSCA
	<i>Turbopsebius diligens</i>	USA: California, Plumas Co., Frenchmans Lake	SRR6453544	CSCA
Asilidae	<i>Zosteria rosevillensis</i>	Australia: Canberra, Australian Capital territory	Unpublished (Zrosev_1Kite)	ANIC
Bombyliidae	<i>Bombylius major</i>	Germany: North Rhine-Westphalia, Bonn	SAMN02047145	ZFMK
Hilarimorphidae	<i>Hilarimorpha</i> sp.	Canada: Saskatchewan	SRP128553	NCSU
Nemestrinidae	<i>Trichophthalma ricardoae</i>	Australia: Canberra, Australian Capital territory	Unpublished (Tricar_1Kite)	ANIC
Pantophthalmidae	<i>Pantophthalmus roseni</i>	Unavailable	Unpublished (Prosen_1Kite)	Unavailable
Tabanidae	<i>Scaptia jacksoniensis</i>	Australia: Bermagui, New South Wales	Unpublished (Sjacks_1Kite)	ANIC
Xylophagidae	<i>Xylophagus abdominalis</i>	Unavailable	Unpublished (Xabdomb_1Kite)	Unavailable