

Table S1. Statistics of genome and raw reads of *Argyrodes miniaceus* and *Liphistius maewongensis*.

Total length, number of raw reads, and assembled genome statistics generated by ABYSS-FAC: number of sequences, number of sequences which longer than 500 bps, number of sequences which longer than N50, minimum length of sequences, N80, N50, N20, expected length of sequences, maximum length of sequences, and the total length of sequences.

Species name	n	n:500	L50	min	N80	N50	N20	E-size	max	sum	Raw reads length (bp)	Raw reads number
<i>Argyrodes miniaceus</i>	706458	54964	22604	500	547	618	753	701	5834	35580000	14415943615	142732116
<i>Liphistius maewongensis</i>	162360	1273	303	500	657	1003	2308	2131	14380	1283559	7755837391	76790777

Table S2. Number of sequences that are the 7 selected body size genes in Arachnida species for functional site probes design.

Name	Number
Dmrt	2
ecdysone	54
homothorox	8
Insulin	167
Juvenile hormone	139
myc	18
transformer	23
Total	411

Table S3. Body size genes from *Drosophila melanogaster* genes that we used to identify similar transcripts from six spider transcriptomes.

Name and number of collected genes of <i>Drosophila</i> <i>melanogaster</i>		Identified transcripts in spider transcriptomes			
Gene name	Number	<i>Argyrodes miniaceus</i>	<i>Trichonephila clavipes</i>	<i>Theridion californicum</i>	<i>Theridion grallator</i>
Dmrt	4	2	0	0	0
Dsx	77	0	0	0	0
transformer	12	0	0	0	0
Myc	3	0	0	0	0
PI3K	5	0	0	0	0
Akt	1	0	0	0	0
Insulin	9	0	0	0	0
IIS	243	0	1	0	0
IDGF	6	0	0	0	0
Juvenile hormone	91	12	4	0	0
Ecdysone	232	93	41	15	14
total	683	107	46	15	14
All transcripts					182

Table S4. Results of using Arachnid probe set to test *in silico* on each spider genome: detected UCEs loci number, detected UCEs loci number rate in all contigs, number of contigs, duplicate contigs number and duplicate UCE loci number.

Species name	Detected UCEs loci number	Detected UCEs loci rate	Contigs number	Duplicate contigs number	Duplicate UCE loci number
<i>Acanthoscurria geniculata</i>	672	93.33	720	43	47
<i>Anelosimus studiosus</i>	57	98.28	58	0	1
<i>Araneus ventricosus</i>	32	94.12	34	0	2
<i>Argiope bruennichi</i>	34	97.14	35	0	1
<i>Argyrodes miniaceus</i>	44	91.67	48	0	4
<i>Dolomedes plantarius</i>	34	89.47	38	2	4
<i>Dysdera silvatica</i>	3	100	3	0	0
<i>Latrodectus hesperus</i>	609	86.75	702	91	92
<i>Loxosceles reclusa</i>	591	87.17	678	89	87
<i>Oedothorax gibbosus</i>	18	100	18	0	0
<i>Parasteatoda tepidariorum</i>	757	88.43	856	95	99
<i>Pardosa pseudoannulata</i>	31	86.11	36	2	5
<i>Stegodyphus dumicola</i>	815	90.86	897	72	82
<i>Stegodyphus mimosarum</i>	850	90.33	941	81	91
<i>Trichonephila clavipes</i>	32	96.97	33	0	1

Table S5. Results of using the Araneae probe set to test *in silico* on each spider genome: detected UCE loci number, detected UCE loci number rate in all contigs, number of contigs, duplicate contigs number and duplicate UCE loci number.

Species name	Detected UCE loci number	Detected UCE loci rate	Contig number	Duplicate contig number	Duplicate UCE loci number
<i>Acanthoscurria geniculata</i>	1465	89.11	1644	173	178
<i>Anelosimus studiosus</i>	183	87.14	210	17	27
<i>Araneus ventricosus</i>	144	87.8	164	11	20
<i>Argiope bruennichi</i>	143	87.73	163	11	20
<i>Argyrodes miniae</i>	147	96.08	153	1	5
<i>Dolomedes plantarius</i>	127	93.38	136	4	9
<i>Dysdera silvatica</i>	30	88.24	34	3	4
<i>Latrodectus hesperus</i>	184	73.6	250	47	65
<i>Loxosceles reclusa</i>	1538	85.73	1794	249	256
<i>Oedothorax gibbosus</i>	64	88.89	72	7	8
<i>Parasteatoda tepidariorum</i>	1599	85.46	1871	267	270
<i>Pardosa pseudoannulata</i>	110	91.67	120	2	10
<i>Stegodyphus dumicola</i>	1579	86.76	1820	239	241
<i>Stegodyphus mimosarum</i>	1654	86.55	1911	253	257
<i>Trichonephila clavipes</i>	136	89.47	152	7	16
<i>Acanthoscurria geniculata</i>	1465	89.11	1644	173	178

Table S6. Results of using the Araneoidea probe set to test in silico on each spider genome: detected UCE loci number, detected UCE loci number rate in all contigs, number of contigs, duplicate contigs number and duplicate UCE loci number.

Species name	Detected UCE loci number	Detected UCE loci rate	Contig number	Duplicate contig number	Duplicate UCE loci number
<i>Acanthoscurria geniculata</i>	27	90	30	5	3
<i>Anelosimus studiosus</i>	179	79.56	225	36	45
<i>Araneus ventricosus</i>	253	76.44	331	60	78
<i>Argiope bruennichi</i>	244	73.72	331	68	87
<i>Argyrodes miniaceus</i>	142	81.61	174	39	32
<i>Dolomedes plantarius</i>	99	75.57	131	20	32
<i>Dysdera silvatica</i>	26	72.22	36	8	10
<i>Latrodectus hesperus</i>	985	76	1296	303	308
<i>Loxosceles reclusa</i>	893	78.89	1132	233	237
<i>Oedothorax gibbosus</i>	62	79.49	78	12	15
<i>Parasteatoda tepidariorum</i>	970	75.72	1281	303	308
<i>Pardosa pseudoannulata</i>	79	71.82	110	20	31
<i>Stegodyphus dumicola</i>	965	76.53	1261	288	291
<i>Stegodyphus mimosarum</i>	1005	76.19	1319	307	309
<i>Trichonephila clavipes</i>	1020	76.58	1332	309	306

Table S7. Results of probe set designing for combined probe set in silico test on each genome: detected UCE loci number, detected UCE loci number rate in all contigs, number of contigs, duplicate contigs number and duplicate UCE loci number.

Species name	Detected UCE loci number	Detected UCE loci rate	Contig number	Duplicate contig number	Duplicate UCE loci number
<i>Acanthoscurria geniculata</i>	1627	91.05	1787	129	160
<i>Anelosimus studiosus</i>	225	80.65	279	29	54
<i>Araneus ventricosus</i>	261	82.08	318	38	57
<i>Argiope bruennichi</i>	264	81.99	322	40	58
<i>Argyrodes miniae</i>	181	90.05	201	8	20
<i>Dolomedes plantarius</i>	130	81.25	160	20	30
<i>Dysdera silvatica</i>	26	76.47	34	0	8
<i>Latrodectus hesperus</i>	1170	80.41	1455	225	282
<i>Loxosceles reclusa</i>	2101	83.64	2512	394	410
<i>Oedothorax gibbosus</i>	76	80.85	94	13	18
<i>Parasteatoda tepidariorum</i>	2320	82.12	2825	488	501
<i>Pardosa pseudoannulata</i>	115	80.99	142	18	27
<i>Stegodyphus dumicola</i>	2367	83.7	2828	452	460
<i>Stegodyphus mimosarum</i>	2477	83.51	2966	481	487
<i>Trichonephila clavipes</i>	778	77.41	1005	137	227

Table S8. Retention number of loci in data set after filtered by different standards.

Probe set	Occupancy in filtering	Retention number of loci	Total number of loci	Taxa number in filtering	Retention rate of loci
Arachnid probe set	0.1	893	893	1	1
	0.2	893		3	1
	0.3	760		4	0.851064
	0.4	204		6	0.228443
	0.5	53		7	0.059351
	0.6	35		9	0.039194
	0.7	28		10	0.031355
	0.8	15		12	0.016797
	0.9	14		13	0.015677
	0.75	22		11	0.024636
	1	1		15	0.00112
Araneae probe set	0.1	1737	1737	1	1
	0.2	1737		3	1
	0.3	1613		4	0.928613
	0.4	257		6	0.147956
	0.5	202		7	0.116292
	0.6	144		9	0.082902
	0.7	126		10	0.072539
	0.8	71		12	0.040875
	0.9	40		13	0.023028
	0.75	100		11	0.057571
	1	3		15	0.001727
Araneoidea probe set	0.1	1046	1046	1	1
	0.2	1046		3	1
	0.3	1035		4	0.989484
	0.4	756		6	0.722753
	0.5	295		7	0.282027
	0.6	153		9	0.146272
	0.7	102		10	0.097514
	0.8	53		12	0.050669
	0.9	34		13	0.032505
	0.75	70		11	0.066922
	1	3		15	0.002868
Combined probe set	0.1	2603	2603	1	1
	0.2	2603		3	1
	0.3	2374		4	0.912025
	0.4	744		6	0.285824
	0.5	324		7	0.124472
	0.6	177		9	0.067998
	0.7	131		10	0.050327
	0.8	65		12	0.024971
	0.9	36		13	0.01383
	0.75	91		11	0.03496
	1	4		15	0.001537

Table S9. Number of loci of each genome after filtering by occupancy (50% and 75%).

species name	loci number	occupancy	probe set
<i>Acanthoscurria geniculata</i>	141	0.5	Combined probe set
<i>Anelosimus studiosus</i>	192		
<i>Araneus ventricosus</i>	239		
<i>Argiope bruennichi</i>	247		
<i>Argyroides miniaceus</i>	147		
<i>Dolomedes plantarius</i>	122		
<i>Dysdera silvatica</i>	22		
<i>Latrodectus hesperus</i>	278		
<i>Loxosceles reclusa</i>	242		
<i>Oedothorax gibbosus</i>	73		
<i>Parasteatoda tepidariorum</i>	310		
<i>Pardosa pseudoannulata</i>	105		
<i>Stegodyphus dumicola</i>	316		
<i>Stegodyphus mimosarum</i>	321		
<i>Trichonephila clavipes</i>	267		
<i>Acanthoscurria geniculata</i>	64	0.75	Combined probe set
<i>Anelosimus studiosus</i>	86		
<i>Araneus ventricosus</i>	83		
<i>Argiope bruennichi</i>	86		
<i>Argyroides miniaceus</i>	67		
<i>Dolomedes plantarius</i>	83		
<i>Dysdera silvatica</i>	19		
<i>Latrodectus hesperus</i>	84		
<i>Loxosceles reclusa</i>	72		
<i>Oedothorax gibbosus</i>	49		
<i>Parasteatoda tepidariorum</i>	87		
<i>Pardosa pseudoannulata</i>	75		
<i>Stegodyphus dumicola</i>	89		
<i>Stegodyphus mimosarum</i>	90		
<i>Trichonephila clavipes</i>	84		
<i>Acanthoscurria geniculata</i>	45	0.5	Arachnid probe set
<i>Anelosimus studiosus</i>	42		
<i>Araneus ventricosus</i>	30		
<i>Argiope bruennichi</i>	32		
<i>Argyroides miniaceus</i>	33		
<i>Dolomedes plantarius</i>	30		

<i>Dysdera silvatica</i>	3		
<i>Latrodectus hesperus</i>	49		
<i>Loxosceles reclusa</i>	41		
<i>Oedothorax gibbosus</i>	18		
<i>Parasteatoda tepidariorum</i>	51		
<i>Pardosa pseudoannulata</i>	27		
<i>Stegodyphus dumicola</i>	51		
<i>Stegodyphus mimosarum</i>	52		
<i>Trichonephila clavipes</i>	29		
<i>Acanthoscurria geniculata</i>	21		
<i>Anelosimus studiosus</i>	21		
<i>Araneus ventricosus</i>	19		
<i>Argiope bruennichi</i>	21		
<i>Argyroides miniaceus</i>	18		
<i>Dolomedes plantarius</i>	22		
<i>Dysdera silvatica</i>	3		
<i>Latrodectus hesperus</i>	21	0.75	
<i>Loxosceles reclusa</i>	17		
<i>Oedothorax gibbosus</i>	12		
<i>Parasteatoda tepidariorum</i>	21		
<i>Pardosa pseudoannulata</i>	18		
<i>Stegodyphus dumicola</i>	21		
<i>Stegodyphus mimosarum</i>	22		
<i>Trichonephila clavipes</i>	19		
<i>Acanthoscurria geniculata</i>	180		
<i>Anelosimus studiosus</i>	155		
<i>Araneus ventricosus</i>	139		
<i>Argiope bruennichi</i>	138		
<i>Argyroides miniaceus</i>	131		
<i>Dolomedes plantarius</i>	115		
<i>Dysdera silvatica</i>	26	0.5	Araneae probe set
<i>Latrodectus hesperus</i>	149		
<i>Loxosceles reclusa</i>	168		
<i>Oedothorax gibbosus</i>	62		
<i>Parasteatoda tepidariorum</i>	195		
<i>Pardosa pseudoannulata</i>	99		
<i>Stegodyphus dumicola</i>	193		

<i>Stegodyphus mimosarum</i>	200		
<i>Trichonephila clavipes</i>	132		
<i>Acanthoscurria geniculata</i>	88		
<i>Anelosimus studiosus</i>	91		
<i>Araneus ventricosus</i>	93		
<i>Argiope bruennichi</i>	91		
<i>Argyroides miniae</i>	74		
<i>Dolomedes plantarius</i>	84		
<i>Dysdera silvatica</i>	22		
<i>Latrodectus hesperus</i>	91	0.75	
<i>Loxosceles reclusa</i>	89		
<i>Oedothorax gibbosus</i>	52		
<i>Parasteatoda tepidariorum</i>	97		
<i>Pardosa pseudoannulata</i>	73		
<i>Stegodyphus dumicola</i>	95		
<i>Stegodyphus mimosarum</i>	99		
<i>Trichonephila clavipes</i>	92		
<i>Acanthoscurria geniculata</i>	26		
<i>Anelosimus studiosus</i>	171		
<i>Araneus ventricosus</i>	232		
<i>Argiope bruennichi</i>	230		
<i>Argyroides miniae</i>	128		
<i>Dolomedes plantarius</i>	93		
<i>Dysdera silvatica</i>	26		
<i>Latrodectus hesperus</i>	285	0.5	
<i>Loxosceles reclusa</i>	230		
<i>Oedothorax gibbosus</i>	58		
<i>Parasteatoda tepidariorum</i>	285		Araneoidea probe set
<i>Pardosa pseudoannulata</i>	76		
<i>Stegodyphus dumicola</i>	284		
<i>Stegodyphus mimosarum</i>	291		
<i>Trichonephila clavipes</i>	288		
<i>Acanthoscurria geniculata</i>	25		
<i>Anelosimus studiosus</i>	68		
<i>Araneus ventricosus</i>	68		
<i>Argiope bruennichi</i>	68	0.75	
<i>Argyroides miniae</i>	55		
<i>Dolomedes plantarius</i>	64		

<i>Dysdera silvatica</i>	22	
<i>Latrodectus hesperus</i>	67	
<i>Loxosceles reclusa</i>	58	
<i>Oedothorax gibbosus</i>	39	
<i>Parasteatoda tepidariorum</i>	67	
<i>Pardosa pseudoannulata</i>	63	
<i>Stegodyphus dumicola</i>	69	
<i>Stegodyphus mimosarum</i>	69	
<i>Trichonephila clavipes</i>	67	
