

## Appendix A. Details on the limb diversity data set on fossil and living Crustacea

Datasets on limb diversity from Cisne (1) and Wills *et al.* (2) were used as starting points, with all limb formulae verified or rescored for this study by M.A.W. To provide even coverage of the entire range of body plan diversity in both fossil and Recent Crustacea, many additional taxa were coded. We adopted largely an ordinal-level approach because previous workers found little variation in tagmosis values within orders (1, 3). Although one must be cautious of circularity when using a taxonomic approach to sampling morphologies, we suggest that this is not a major issue here. Although limbs can be among the defining features of orders, many other characters are generally also used to designate orders (e.g., carapace and somite features) (see 4). Moreover, the degree of limb differentiation along the body axis cannot be inferred from particular limb traits.

We initially coded one representative from each order, following the taxonomic scheme of Martin and Davis (5) for living representatives. However, additional exemplars were coded in a number of orders. In most cases, the limb formulae were identical or very similar (resulting in a difference of  $<0.1$  Brillouin tagmosis units), and just one representative was selected. However, there was more variation observed in the Brachypoda, Anaspidacea, and Diplostraca. In the first two cases, the indices from two exemplars were averaged to provide the values used for these orders in all analyses. The case of Diplostraca was more complex.

Although it was preferable to use ordinal definitions according to one set of authors for consistency, the diplostracans are anomalous in their level of tagmosis diversity ( $>1.0$  Brillouin tagmosis units). Moreover, the ranks of the taxa in this group have been the subject of much discussion, with several key branchiopod works adopting a system that includes seven different orders of “diplostracans” (6-8). Therefore, we sampled a representative of each of these seven orders and used a phylogenetically weighted average to calculate a single value for the Diplostraca. The topology [Laevicaudata, Spinicaudata, Cyclotherida (Haplopoda, Onychopoda), (Anomopoda,

Ctenopoda] was selected because of its support in maximum likelihood (ML), Bayesian, and maximum parsimony analyses based on six genes (9) and in ML and Bayesian analyses involving two ribosomal genes (10). Although the Notostraca fell within the Diplostraca in some of these phylogenies, we retained the exemplar of this order as separate (as in ref. 5).

Many problematic fossil taxa are not formally assigned to orders, or they are treated very differently by several authors. These, by their very nature, often preserve unique combinations of characters, unfamiliar patterns of serial limb differentiation, and distinctive and/or apomorphic appendage morphologies. Their inclusion was vital to encompass the full disparity of tagmosis patterns. Schram (4) provided the most recent classification including all fossil Crustacea, to which we added several problematic, anomalous, or more recently described fossils (11-14). The affinities of the Euthycarcinoidea (13) are, at best, uncertain, with a number of authors allying them to the hexapods or myriapods, and others resolving them as stem-group mandibulates (14). None of the trends or conclusions discussed in this paper is materially affected by their omission. In addition, the ostracod taxonomy was revised according to Liebau (15). Geological ranges were according to Benton (16), updated using taxon-specific sources and more recent evidence (11-14, 17-22). All data are presented in Table A1.

There are approximately five ordinal-level taxa of which we are aware that are missing from our current dataset. In a few cases, these absences are caused by inadequate preservation of limb structure. Anything less than the most exceptional preservation could bias toward an underestimate of the disparity of appendage types in fossils, whereas more compromised preservation might underestimate the number of limb pairs.

Because most of the primarily parasitic higher taxa have very low tagmosis values for their classes (and sometimes even no limbs at all), parasites were omitted from analyses unless otherwise indicated. However, they were included in Table A1 for a more complete record of the range of morphological diversity found in the Crustacea.

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22. Kotov AA, Korovchinsky NM (2006) *Zool J Linn Soc* 146:269-274.

**Table A1. Limb formulae and limb diversity indices for all crustacean taxa included in the work.**

The limb formulae specify the number of limbs of each limb type (from anterior to posterior), while numbers in parentheses indicate the disparity (i.e., differentiation) score of each of limb pair from the adjacent, posterior limb pair. Primarily parasitic or commensal groups are designated after the order name (PAR) and were excluded from most analyses.

Order	Stratigraphic range	Scored taxon	Limb formula	Tagmosis (Brillouin index)	Total no. of limbs	No. of limb types	No. of types per limb	Average disparity per limb	Total disparity score of limb differences
<b>Class Branchiopoda</b>									
Lipostraca <sup>†</sup>	PRA-PRA	<i>Lepidocaris rhyniensis</i> <sup>†</sup>	1(3),1(4),1(4),1(4), 1(2),2(1),3(1),5(3), 1(2),1(2),1	2.334	18	11	0.6111	1.444	26
Kazacharthra <sup>†</sup>	CRN-TOA	<i>Almatium gusevi</i> <sup>†</sup>	1(3),1(4),1(3),1(3), 1(4),1(1),5(1),5(4), 1	2.031	17	9	0.5294	1.353	23
Anostraca	LUD-HOL	<i>Artemia salina</i>	1(4),1(4),1(3),1(3), 1(4),1(3),1(3),1	1.514	18	8	0.4444	1.333	24

Order	Stratigraphic range	Scored taxon	Limb formula	Tagmosis (Brillouin index)	Total no. of limbs	No. of limb types	No. of types per limb	Average disparity per limb	Total disparity score of limb differences
Notostraca	KAS-HOL	<i>Lepidurus lynchi</i>	1(2),1(4),1(3),1(3), 1(5),1(2),1(2),9(2), 60(4),1(1),1	1.174	78	11	0.1410	0.359	28
Diplostraca (Laevicaudata)	BER-HOL	<i>Lyncaeus brachyurus</i>	1(4),1(4),1(4),1(2), 1(4),13(4),1	1.275	19	7	0.3684	1.158	22
Diplostraca (Spinicaudata)	LOK-HOL	<i>Limnadia lenticularis</i>	1(4),1(4),1(4),1(2), 1(4),22(4),1	1.001	28	7	0.250	0.786	22
Diplostraca (Cyclestherida)	HOL-HOL	<i>Cyclestheria hislopi</i>	1(4),1(4),1(4),1(2), 1(4),15(4),1	1.201	21	7	0.333	1.048	22
Diplostraca (Anomopoda)	BER-HOL	<i>Daphnia pulex</i>	1(5),1(4),1(4),1(3), 1(3),1(1),2(2),1(3), 1	2.079	10	9	0.900	2.5	25
Diplostraca (Ctenopoda)	TTH-HOL	<i>Sida crystallina</i>	1(5),1(4),1(4),1(3), 1(4),5(1),1(3),1	1.827	12	8	0.667	2.0	24
Diplostraca (Haplopoda)	HOL-HOL	<i>Leptodora kindtii</i>	1(5),1(4),1(4),1(5), 1(2),3(2),1(2),1(3), 1	2.061	11	9	0.818	2.455	27

Order	Stratigraphic range	Scored taxon	Limb formula	Tagmosis (Brillouin index)	Total no. of limbs	No. of limb types	No. of types per limb	Average disparity per limb	Total disparity score of limb differences
Diplostraca (Onychopoda)	HOL-HOL	<i>Cercopagis pengoi</i>	1(5),1(4),1(4),1(5), 1(1),3(3),1(3),1	1.921	10	8	0.800	2.5	25
Diplostraca (composite used for taxonomic analyses)	LOK-HOL	Phylogenetically weighted average of the seven taxa above		1.284	20.47	7.188	0.388	1.202	22.41
<b>Class Remipedia</b>									
Nectiopoda	HOL-HOL	<i>Speleonectes ondiniae</i>	1(3),1(3),1(4),1(4), 1(2),1(1),1(4),19(3),1	1.347	27	9	0.333	0.889	24
Enantiopoda <sup>†</sup>	VIS-MOS	<i>Tesnusocaris goldichi</i> <sup>†</sup>	1(5),1(5),1(3),1(1), 1(5),15(1),1	1.201	21	7	0.333	0.952	20
<b>Class Cephalocarida</b>									
Brachypoda	HOL-HOL	<i>Hutchinsoniella macracantha</i>	1(3),1(4),1(4),1(2), 8(3),1(2),1(3),1	1.663	15	8	0.533	1.4	21
Brachypoda	HOL-HOL	<i>Sandersiella acuminata</i>	1(3),1(4),1(4),1(2), 6(1),1(1),1(3),1(2),	2.051	15	10	0.667	1.533	23

Order	Stratigraphic range	Scored taxon	Limb formula	Tagmosis (Brillouin index)	Total no. of limbs	No. of limb types	No. of types per limb	Average disparity per limb	Total disparity score of limb differences
			1(3),1						
Brachypoda (composite used for all analyses)	HOL-HOL	Average of the two taxa above		1.857	15	9	0.6	1.467	22
<b>Class Maxillopoda</b>									
Infraclass Facetotecta (PAR)	HOL-HOL		N/A (no limbs in adults)						
Laurida (Infraclass Ascothoracida) (PAR)	CMP-HOL	<i>Synagoga normani</i>	1(4),1(4),1(3),1(4), 1(3),1(2),2(1),2(4), 1	2.114	11	9	0.818	2.273	25
Dendrogastrida (Infraclass Ascothoracida) (PAR)	TUR-HOL	<i>Ascothorax ophioctenis</i>	1(4),1(4),1(3),1(3), 1(3),1(2),2(2),1(2), 1(4),1	2.205	11	10	0.909	2.455	27
Apygophora (Superorder Acrothoracica)	ANS-HOL	<i>Trypetesa lateralis</i>	1(3),1(1),1(5),1(5), 3(4),1	1.589	8	6	0.75	2.25	18
Pygophora	LOK-HOL	<i>Weltneria hessleri</i>	1(3),1(1),1(5),1(5),	1.488	10	6	0.6	1.8	18



Order	Stratigraphic range	Scored taxon	Limb formula	Tagmosis (Brillouin index)	Total no. of limbs	No. of limb types	No. of types per limb	Average disparity per limb	Total disparity score of limb differences
(Superorder Acrothoracica)		(female)	5(4),1						
Kentrogonida (Superorder Rhizocephala) (PAR)	HOL-HOL	<i>Sacculina carcini</i>	N/A (no limbs in adults)						
Akentrogonida (Superorder Rhizocephala) (PAR)	HOL-HOL	<i>Chthamalophilus delagei</i>	N/A (no limbs in adults)						
Pedunculata (Superorder Thoracica)	STD-HOL	<i>Lepas anatifera</i>	1(5),1(3),1(1),1(5), 3(3),3	1.662	10	6	0.6	1.7	17
Sessilia (Superorder Thoracica)	TTH-HOL	<i>Balanus balanoides</i>	1(5),1(3),1(1),1(5), 3(3),3	1.662	10	6	0.6	1.7	17
Subclass Tantulocarida (PAR)	HOL-HOL	<i>Basipodella harpacticola</i>	1(5),1	0.5	2	2	1	2.5	5
Arguloidea (Subclass Branchiura) (PAR)	HOL-HOL	<i>Argulus foliaceus</i>	1(4),1(4),1(5),1(5), 1(4),4(3),1	1.721	10	7	0.7	2.5	25

Order	Stratigraphic range	Scored taxon	Limb formula	Tagmosis (Brillouin index)	Total no. of limbs	No. of limb types	No. of types per limb	Average disparity per limb	Total disparity score of limb differences
Cephalobaenida (Subclass Pentastomida) (PAR)	MER-HOL*	<i>Cephalobaena tetrapoda</i>	1(1),1	0.5	2	2	1	0.5	1
Porocephalida (Subclass Pentastomida) (PAR)	HOL-HOL	<i>Sebekia</i> sp.	1(1),1	0.5	2	2	1	0.5	1
Mystacocaridida	HOL-HOL	<i>Derocheilocaris typicus</i>	1(3),1(2),1(3),1(1), 1(2),1(2),4(3),1	1.879	11	8	0.727	1.455	16
Platycopioidea (Subclass Copepoda)	HOL-HOL	<i>Platycopia inornata</i>	1(3),1(4),1(3),1(3), 1(3),1(3),4(1),1(4), 1(4),1	2.150	13	10	0.769	2.154	28
Calanoida (Copepoda)	HOL-HOL	<i>Calanus finmarchicus</i>	1(3),1(4),1(3),1(3), 1(3),1(3),4(1),1(4), 1(4),1	2.150	13	10	0.769	2.154	28
Misophrioida (Copepoda)	HOL-HOL	<i>Misophria pallida</i>	1(3),1(4),1(3),1(3), 1(3),1(3),4(2),1(4), 1(4),1	2.150	13	10	0.769	2.231	29

Order	Stratigraphic range	Scored taxon	Limb formula	Tagmosis (Brillouin index)	Total no. of limbs	No. of limb types	No. of types per limb	Average disparity per limb	Total disparity score of limb differences
Cyclopoida (Copepoda)	HOL-HOL	<i>Cyclopinoidea longicornis</i>	1(4),1(4),1(3),1(3), 1(3),1(3),4(3),1(4), 1(4),1	2.150	13	10	0.769	2.385	31
Gelyelloida (Copepoda)	HOL-HOL	<i>Gelyella droguei</i>	1(3),1(4),1(3),1(3), 1(3),1(3),3(4),1(4), 1	2.061	11	9	0.818	2.455	27
Mormonilloida (Copepoda)	HOL-HOL	<i>Mormonilla phasma</i>	1(3),1(4),1(3),1(3), 1(3),1(3),4(4),1(4), 1	2.021	12	9	0.75	2.25	27
Harpacticoida (Copepoda)	MMI-HOL	<i>Canuella perplexa</i>	1(3),1(4),1(3),1(3), 1(3),1(3),4(2),1(4), 1(4),1	2.150	13	10	0.769	2.231	19
Poecilostomatoida (Copepoda) (PAR)	HOL-HOL	<i>Clausidium vancouverense</i>	1(3),1(4),1(3),1(3), 1(3),1(3),4(3),1(4), 1(4),1	2.150	13	10	0.769	2.308	30
Siphonostomatoida (Copepoda) (PAR)	APT-HOL	<i>Asterocheres reginae</i>	1(3),1(4),1(3),1(3), 1(3),1(3),4(1),1(4),	2.150	13	10	0.769	2.154	28

Order	Stratigraphic range	Scored taxon	Limb formula	Tagmosis (Brillouin index)	Total no. of limbs	No. of limb types	No. of types per limb	Average disparity per limb	Total disparity score of limb differences
Monstrilloida (Copepoda) (PAR, juveniles, adults are free-living)	MMI-HOL	<i>Monstrilla helgolandica</i>	1(4),1 1(3),1(4),1(3),1(3), 1(3),1(3),4(2),1(4), 1(4),1	2.150	13	10	0.769	2.231	29
<b>Class Ostracoda</b>									
Palaeocopida	TRE-TAT	None with appendages preserved							
Punciocopida	TRE-HOL	<i>Manawa staceyi</i>	1(2),1(3),1(4),1(3), 3(2),1	1.589	8	6	0.75	1.75	14
Platycopida	TRE-HOL	<i>Cytherella abyssorum</i>	1(3), 1(4), 1(3), 1(3), 1(3), 1(4), 1	1.757	7	7	1	2.857	20
Podocopida	ARG-HOL	<i>Macrocypriis maddocksaе</i>	1(2), 1(4), 1(3), 1(4), 1(4), 1	1.582	6	6	1	2.833	17
Cypridinida	LLY-HOL	<i>Cypridina norvegica</i>	1(4), 1(4), 1(3), 1(4), 1(4), 1(5), 1(5), 1	1.912	8	8	1	3.625	29

Order	Stratigraphic range	Scored taxon	Limb formula	Tagmosis (Brillouin index)	Total no. of limbs	No. of limb types	No. of types per limb	Average disparity per limb	Total disparity score of limb differences
Halocypridida	WEN-HOL	<i>Halocypris pelagica</i>	1(2), 1(4), 1(3), 1(2), 1(2), 1(2), 1(4), 1	1.912	8	8	1	2.375	19
Leperditicopida <sup>†</sup>	ARG-FAM	None with appendages preserved							
Bradoriida (Ostracoda) <sup>†</sup> (excluded from analysis because of poor preservation)	CRF-TRE	<i>Kunmingella maotianshanensis</i> <sup>†</sup>	Tentatively: 1(4), 3(3), 1(2), 2	1.245	7	4	0.571	1.286	9
<b>Class Malacostraca</b>									
Archaeostraca <sup>†</sup>	TRE-TAT	<i>Nahecaris</i> <sup>†</sup>	1(3), 1(4), 1(2), 1(1), 1(3), 8(3), 5(3), 1	1.818	19	8	0.421	1	19
Hoplostroaca <sup>†</sup> (excluded from analysis because of poor preservation)	VIS-MOS	<i>Kellibrooksia macrogaster</i> <sup>†</sup>	Tentatively: 1(2), 1(3), 1(2), 1(2), 1(5), 1(4), 7(3), 5(3), 1	1.976	19	9	0.474	1.263	24

Order	Stratigraphic range	Scored taxon	Limb formula	Tagmosis (Brillouin index)	Total no. of limbs	No. of limb types	No. of types per limb	Average disparity per limb	Total disparity score of limb differences
Leptostraca	KAZ-HOL	<i>Nebalia pugettensis</i>	1(3),1(3),1(3),1(3), 1(3),8(4),4(4),2(1), 1	2.010	20	9	0.45	1.2	24
Aeschronectida <sup>†</sup>	VIS-GZE	<i>Kallidecthes richardsoni</i> <sup>†</sup>	1(3),1(4),1(2),1(2), 1(2),8(2),5(3),1	1.818	19	8	0.421	0.947	18
Palaeostomatopoda <sup>†</sup>	FAM-SPK	<i>Tyrranophontes theridion</i> <sup>†</sup>	1(2),1(3),1(3),1(1), 1(3),1(5),4(4),3(4), 5(3),1	2.246	19	10	0.526	1.474	28
Stomatopoda	SPK-HOL	<i>Squilla mantis</i>	1(4),1(4),1(3),1(4), 1(4),1(5),1(4),3(4), 3(4),5(4),1	2.352	19	11	0.579	2.105	40
Eocaridacea <sup>†</sup>	GIV-MOS	<i>Eocaris socialis</i> <sup>†</sup>	1(3),1(5),1(3),1(1), 1(4),8(4),5(3),1	1.818	19	8	0.421	1.211	23
Belotelsonidea <sup>†</sup>	TOU-MOS	<i>Belotelson magister</i> <sup>†</sup>	1(3),1(5),1(3),1(1), 1(4),8(4),5(3),1(3), 1	1.944	20	9	0.45	1.3	26
Palaeocaridacea <sup>†</sup>	VIS-KUN	<i>Acanthotelson</i>	1(3),1(4),1(3),1(1),	2.207	19	10	0.526	1.211	23

Order	Stratigraphic range	Scored taxon	Limb formula	Tagmosis (Brillouin index)	Total no. of limbs	No. of limb types	No. of types per limb	Average disparity per limb	Total disparity score of limb differences
		<i>stimpsoni</i> <sup>†</sup>	1(2),1(2),2(3),5(3), 5 (2),1						
Bathynellacea	HOL-HOL	<i>Bathynella natans</i>	1(2),1(3),1(3),1(2), 1(3),2(2),5(3),1(2), 1(3),1(3),1	2.271	16	11	0.688	1.625	26
Anaspidacea	ANS-HOL	<i>Anaspides tasmaniae</i>	1(3),1(4),1(3),1(3), 1(4),1(2),1(1),5(3), 1(1),5(4),1	2.260	19	11	0.579	1.474	28
Anaspidacea	ANS-HOL	<i>Parastygocaris andina</i>	1(3),1(4),1(3),1(3), 1(4),1(2),1(1),5(3), 1(3),1	2.103	14	10	0.714	1.857	26
Anaspidacea (composite used for all analyses)	ANS-HOL	Average of the two taxa above		2.182	16.5	10.5	0.646	1.666	27
Spelaeogriphacea	TOU-HOL	<i>Spelaeogriphus lepidops</i>	1(3),1(4),1(2),1(2), 1(3),1(3),3(2),3(2), 1(3),4(3),1(3),1	2.474	19	12	0.632	1.579	30

Order	Stratigraphic range	Scored taxon	Limb formula	Tagmosis (Brillouin index)	Total no. of limbs	No. of limb types	No. of types per limb	Average disparity per limb	Total disparity score of limb differences
Spelaeogriphacea (included in matched-pairs analysis; this taxon formerly in separate order Anthracocaridacea <sup>†</sup> )	TOU-SPK	<i>Acadiocaris novascotica</i> <sup>†</sup>	1(3),1(3),1(3),1(3), 1(4),2(3),6(3),5(4), 1	2.0714	19	9	0.474	1.368	26
Thermosbaenacea	HOL-HOL	<i>Thermosbaena mirabilis</i>	1(3),1(3),1(3),1(3), 1(2),1(3),1(3),4(3), 2(4),1	2.197	14	10	0.714	1.929	27
Lophogastrida	MOS-HOL	<i>Eucopia sculpticaudata</i>	1(3),1(4),1(3),1(3), 1(4),1(4),4(4),3(3), 1(4),5(4),1	2.350	20	11	0.55	1.8	36
Mysida	CLV-HOL	<i>Mysis relicta</i>	1(3),1(4),1(3),1(3), 1(4),1(3),1(1),6(4), 5(4),1	2.124	19	10	0.526	1.526	29
Pygocephalomorpha <sup>†</sup>	TOU-TAT	<i>Anthracaris gracilis</i> <sup>†</sup>	1(3),1(4),1(2),1(2), 1(3),2(4),6(3),5(3),	2.184	20	10	0.5	1.4	28



Order	Stratigraphic range	Scored taxon	Limb formula	Tagmosis (Brillouin index)	Total no. of limbs	No. of limb types	No. of types per limb	Average disparity per limb	Total disparity score of limb differences
			1(4),1						
Mictacea	HOL-HOL	<i>Mictocaris halope</i> (female)	1(3),1(3),1(3),1(2), 1(3),1(3),5(1),2(3), 5(4),1	2.207	19	10	0.526	1.316	25
Amphipoda	PRB-HOL	<i>Gammarus locustus</i>	1(2),1(4),1(3),1(3), 1(4),1(3),2(2),2(1), 3(3),3(3),2(2),1	2.557	19	12	0.632	1.579	30
Isopoda	MOS-HOL	<i>Whoia angusta</i>	1(2),1(4),1(3),1(3), 1(4),1(3),1(2),3(1), 3(3),1(3),4(2),1	2.474	19	12	0.632	1.579	30
Tanaidacea	VIS-HOL	<i>Apseudes spinosus</i>	1(2),1(4),1(3),1(4), 1(4),1(5),1(3),3(2), 3(4),5(4),1	2.352	19	11	0.579	1.842	35
Cumacea	SPK-HOL	<i>Cyclaspis bacescui</i>	1(2),1(3),1(3),1(3), 1(4),1(4),1(4),1(2), 2(1),3(3),5(2),1	2.435	19	12	0.632	1.632	31
Euphausiacea	HOL-HOL	<i>Meganyctiphanes</i>	1(3),1(4),1(4),1(2),	2.234	20	11	0.55	1.7	34

Order	Stratigraphic range	Scored taxon	Limb formula	Tagmosis (Brillouin index)	Total no. of limbs	No. of limb types	No. of types per limb	Average disparity per limb	Total disparity score of limb differences
		<i>norvegica</i>	1(3),6(4),1(4),1(5), 5(2),1(3),1						
Amphionidacea	HOL-HOL	<i>Amphionides reynaudii</i>	1(3),1(4),1(3),1(4), 1(3),1(4),1(2),2(2), 1(2),2(3),1(4),1(3), 4(2),1	2.641	19	14	0.737	2.053	39
Decapoda	FAM-HOL	<i>Homarus americanus</i>	1(3),1(4),1(3),1(3), 1(3),1(3),1(3),1(5), 1(3),2(1),2(4),5(4), 1	2.518	19	13	0.684	2.053	39
?	FAM-FAM	<i>Angustidontus seriatus</i> <sup>†</sup>	1(4),1(5),1(2),2(5), 1(5),3(1),4(4),5(4), 1	2.194	19	9	0.474	1.579	30
<b>Taxonomy uncertain</b>									
Canadaspidida <sup>†</sup>	CRF-STD	<i>Canadaspis</i> <sup>†</sup>	1(2),1(4),1(5),2(1), 8(4),1	1.432	14	6	0.4286	1.143	16
Canadaspidida <sup>†</sup>	CRF-STD	<i>Perspica</i> <sup>*</sup>	1(2),1(4),1(5),10	1.039	14	5	0.3571	1.071	15

Order	Stratigraphic range	Scored taxon	Limb formula	Tagmosis (Brillouin index)	Total no. of limbs	No. of limb types	No. of types per limb	Average disparity per limb	Total disparity score of limb differences
			(4),1						
Euthycarcinida <sup>†</sup>	CRF-CRN	<i>Smithixerxes pustulosus</i> *	1(5),1(3),1(4),11	0.792	14	4	0.2857	0.8571	12
?	STD-STD	<i>Odaraia</i> * <sup>†</sup>	2(5),1(5),1(1),1(4),30(5),1	0.816	36	6	0.1667	0.5556	20
?	STD-STD	<i>Waptia</i> * <sup>†</sup>	1(3),1(3),1(3),1(1),1(3),4(3),6(3),1	1.886	16	8	0.5	1.1875	19
?	MER-MER	<i>Skara</i> *	1(3),1(1),1(2),2(1),1(2),1	1.614	7	6	0.8571	1.286	9
?	MER-MER	<i>Martinssonina</i> *	1(3),3(1),1(2),1(3),1	1.388	7	5	0.7143	1.286	9
?	MER-MER	<i>Cambropachycope clarksoni</i> *	1(4),1(3),2(4),1(1),1	1.415	6	5	0.8333	2	12
?	MER-MER	<i>Bredocaris</i> *	1(3),1(2),1(3),1(3),1(1),6(1),1(2),1	1.773	13	8	0.6154	1.154	15
?	MER-MER	<i>Rehbachtella</i> *	1(3),1(2),1(2),1(2),12(2),1	1.147	17	6	0.3529	0.6471	11

Order	Stratigraphic range	Scored taxon	Limb formula	Tagmosis (Brillouin index)	Total no. of limbs	No. of limb types	No. of types per limb	Average disparity per limb	Total disparity score of limb differences
?	EMS-EMS	<i>Cambronatus brasseli</i> <sup>†</sup>	1(5),4(5),11(5),1	1.088	17	4	0.235	0.882	15
?	EMS-EMS	<i>Wingertshellicus backesi</i> <sup>†</sup>	1(3),1(4),1(4),1(4),35(5),1	0.656	40	6	0.15	0.5	20
?	EMS-EMS	<i>Eschenbachielius wuttkenisi</i> <sup>†</sup>	1(3),1(3),13(3),1	0.732	16	4	0.25	0.562	9
Phosphatocopida <sup>†</sup>	MER-MER	<i>Heslandonia unisulcata</i> <sup>†</sup>	1(4),1(2),1(4),1(3),1(1),1(2),1	1.757	7	7	1	2.286	16
Phosphatocopida <sup>†</sup>	MER-MER	<i>Vestrogothia</i> sp. <sup>†</sup>	1(3),1(2),1(2),1(2),1(1),1(3),1	1.757	7	7	1	1.857	13
Phosphatocopida <sup>†</sup> (composite used for analysis)	MER-MER	Average of two taxa above		1.757	7	7	1	2.071	14.5

<sup>†</sup> Extinct.

\*It is unclear to which subclass (Cephalobaenida or Porocephalida) the upper Cambrian pentastomid larvae belong, and so they were assigned randomly because the choice made no difference to our results.