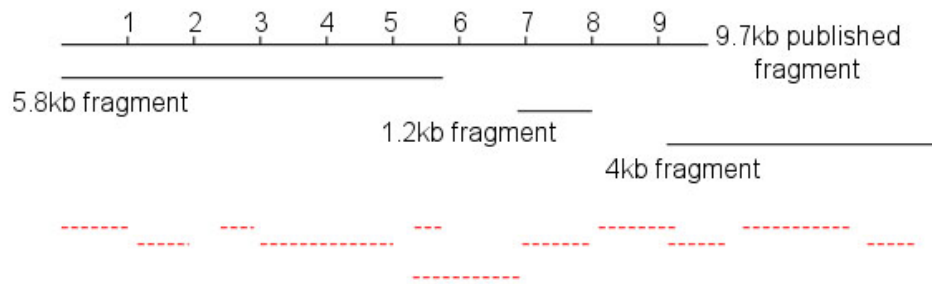


**Supplementary Information: The mitochondrial genomes of the acoelomorph worms
Paratomella rubra and *Isodiametra pulchra***

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Supplementary Figure S1: Schematic of *Paratomella rubra* genome assembly fragments used as an initial starting point for mitochondrial genome inference. PCR sequencing results bridging or covering parts of these fragments indicated by red dashed lines.

Supplementary Table S2: Substitution pattern in eight genes found on the published *Paratomella rubra* mitochondrial genome (sampled from Barcelona, Spain) in comparison to our samples from Yorkshire, UK.

Sequence	Length	S-Sites	N-Sites	Substitutions	S-Substitutions	N-Substitutions
<i>atp6</i>	594	90.8602	503.14	70	40.9815	29.0185
<i>atp8</i>	177	15.4355	161.565	23	10	13
<i>cob</i>	795	113.09	681.91	89	63.9542	25.0458
<i>cox1</i>	1401	158.705	1242.3	116	90.904	25.096
<i>cox2</i>	660	116.441	543.559	81	50.9427	30.0573
<i>cox3</i>	780	99.2387	680.761	87	60.5296	26.4704
<i>nad1</i>	930	95.8574	834.143	103	63.3614	39.6386
<i>nad2</i>	972	156.176	815.824	161	56.7858	104.214
<i>nad6</i>	330	44.3145	285.685	52	31.121	20.879

Supplementary Table S3: Accession numbers (NCBI) for taxa used in study

Classification	Species	Accession Number
Acoela	<i>Paratomella rubra</i>	AY228758
	<i>Paratomella rubra</i> (this study)	submitted
	<i>Symsagittifera roscoffensis</i>	NC_014578.1
	<i>Isodiametra pulchra</i> (this study)	submitted
	<i>Convolutriloba longifissura</i>	Trace Archive Library_id=CT_MM1
	<i>Neochildia fusca</i>	Trace Archive Library_id=NF_MM1
Annelida	<i>Platynereis dumerilii</i>	AF178678
	<i>Urechis caupo</i>	NC_006379
	<i>Lumbricus terrestris</i>	NC_001673.1
Arthropoda	<i>Locusta migratoria</i>	NC_001712
	<i>Daphnia pulex</i>	NC_000844
Brachiopoda	<i>Terebratulina retusa</i>	NC_000941.1
Chaetognatha	<i>Spadella cephaloptera</i>	NC_006386.1
Chordata	<i>Salmo salar</i>	LC012541.1
	<i>Homo sapiens</i>	NC_001807
	<i>Lampetra fluviatilis</i>	NC_001131
	<i>Ornithorhynchus anatinus</i>	NC_000891.1
	<i>Branchiostoma floridae</i>	NC_000834.1
	<i>Asymmetron inferum</i>	NC_009774.1
	<i>Myxine glutinosa</i>	NC_002639.1
	<i>Acropora tenuis</i>	NC_003522.1
Cnidaria	<i>Porites porites</i>	NC_008166
	<i>Discosoma sp</i>	NC_008071.1
	<i>Nematostella sp</i>	NC_008164
	<i>Aurelia aurita</i>	NC_008446.1
Echinodermata	<i>Antedon mediterranea</i>	NC_010692.1
	<i>Florometra serratissima</i>	NC_001878.1
	<i>Strongylocentrotus pallidus</i>	NC_009941.1
	<i>Strongylocentrotus droebachiensis</i>	NC_009940.1
	<i>Strongylocentrotus purpuratus</i>	X12631.1
	<i>Acanthaster brevispinus</i>	NC_007789.1
	<i>Acanthaster planci</i>	NC_007788.1
	<i>Asterias amurensis</i>	NC_006665.1
	<i>Apostichopus japonicus</i>	NC_012616.1
	<i>Cucumaria miniata</i>	NC_005929
	<i>Ophiura albida</i>	NC_010691.1
<i>Ophiopholis aculeata</i>	NC_005334.1	
Hemichordata	<i>Balanoglossus carnosus</i>	NC_001887.1
	<i>Saccoglossus kowalevskii</i>	NC_007438
Mollusca	<i>Sepia esculenta</i>	NC_009690.1
	<i>Aplysia californica</i>	NC_005827.1
	<i>Pupa strigosa</i>	NC_002176
	<i>Biomphalaria tenagophila</i>	NC_010220.1
	<i>Siphonodentalium lobatum</i>	NC_005840.1
Nemertodermatida	<i>Nemertoderma westbladi</i>	AY228757.1
Porifera	<i>Geodia neptuni</i>	NC_006990.1
	<i>Axinella corrugata</i>	NC_006894.1
	<i>Tethya actinia</i>	NC_006991.1
	<i>Amphimedon queenslandica</i>	NC_008944
Priapulida	<i>Priapululus caudatus</i>	DQ463747
Urochordata	<i>Ciona intestinalis</i>	NC_004447.2
	<i>Doliolum nationalis</i>	AB176541.1
Xenoturbellida	<i>Xenoturbella bocki</i>	NC_008556.1
	<i>Xenoturbella hollendorum</i>	NC_029218.1
	<i>Xenoturbella monstrosa</i>	NC_029219.1
	<i>Xenoturbella churro</i>	NC_029217.1
	<i>Xenoturbella profunda</i>	NC_029220.1