

Supplementary Table 2: Morphological observations made prior to DNA extraction (**A**), and from paratype specimens (**B**) for each MOTU (molecular operational taxonomic unit). Identification characters were selected according to Bradford [31], (all specimens except NWP in ethanol). For NWP only specimens in formalin were available. Abbreviations (see also Figure 1): n (Number of specimens); TL (Total length), SD (Standard deviation); P:U (Prosoma:Urosome ratio); A1 (antennules); GS (genital segment); CR (Caudal rami); U3 (Urosome segment 3); U4 (Urosome segment 4); AS (Anal segment); P2, P3, P4 (swimming legs 2, 3, 4); Exp3 (Exopod segment 3); B1 (Coxa).

MOTU	A							B					Remarks
	n	TL(μm)	SD	P:U	SD	shape of forehead	length of A1 relative to body segments	Serration of distal outer edge Exp3 (P2/P3/P4)	B1 with many posterior surface spinules (P2-P4)	Genital segment with posterior spinules	n	Morphotype	
PN	5	623	28.5	3.09	0.23	not vaulted	GS	yes/yes/yes	no	no	3	<i>P. nanus</i>	
PT	3	671	7.2	3.95	0.69	not vaulted	CR	yes/yes/no	yes	?	3	<i>P. tropicus</i>	
PA	18	747	33.2	3.56	0.29	not vaulted	U3	yes/yes/no	yes	yes	4	<i>P. indicus</i>	
SEA/NZ	27	909	82.5	3.29	0.35	vaulted	AS/CR	yes/yes/no	no (only little)	no	4	<i>P. parvus</i>	in NZ <i>P. indicus</i>
NWA	14	891	58.4	3.36	0.30	vaulted	AS/CR	yes/yes?/no (very small)	no	no	2	<i>P. parvus</i>	
NEA	12	892	63.1	3.18	0.15	vaulted	U4/AS	Yes/ Yes (NorthSEa), Batic No/no	no	no	9	<i>P. parvus</i>	Baltic Sea smaller
SWA	5	768	32.6	3.04	0.15	not vaulted	AS	?	no	no	3	?	in references <i>P. parvus</i>
SWP1	1	738	-	3.21	-	?	?	only a single sequence, no paratypes found					
SEI	sequence from GenBank												
SWP	5	675	53.8	2.93	0.21	?	AS/CR	yes/yes/no	?	?	3	<i>P. indicus</i>	Vial 435
NWP	5	920	45.6	3.44	0.23	humped	U4/AS	yes/yes/? (broken legs)	yes (many)	no	4	<i>P. quasimodo</i> strongly ornamented	in formalin
(only paratypes)													
NEP	9	865	35.8	3.17	0.46	humped	AS/CR	yes/yes/yes (very small)	yes (only little)	no	3	<i>P. quasimodo</i> -like	in references <i>P. parvus</i>
SEP	5	873	20.5	3.16	0.03	not vaulted	?	yes/yes/no	yes	no	4	<i>P. indicus</i>	in references <i>P. parvus</i>
PQ	23	847	100.0	3.15	0.17	humped	U3/U4	yes/yes/yes	yes (many)	no	6	<i>P. quasimodo</i>	
PI	22	757	89.0	3.37	0.17	not vaulted	CR	yes/yes/no	yes	yes?	6	<i>P. indicus</i>	

Morphological identification

Five morphospecies of the *Paracalanus parvus* complex could be identified: *Paracalanus parvus*, *Paracalanus indicus*, *Paracalanus quasimodo*, *Paracalanus tropicus* and *Paracalanus nanus* (Fig. 4). *P. nanus*, characterised by short antennules, was found in samples from the tropical Atlantic and Mediterranean. *P. tropicus* was identified from a few samples due to very high P:U ratios in the Red Sea, Indopacific and Southeast Atlantic. Specimens with characteristics of *P. quasimodo* were found in the Atlantic (including the type locality [29] near Cape Hatteras, USA), Mediterranean Sea, Northwest Pacific and Northeast Pacific. These specimens were serrated on the distal outer edge of the Exp3 of the P2-P4, the prosoma was dorsally humped and the coxae of the swimming legs were decorated with spinules. However, specimens from Chinese coastal waters (NWP) were more strongly ornamented than the other two groups. *P. parvus* was identified at the type locality in the North Sea (Helgoland, Germany) and the Baltic Sea. Specimens from the Baltic Sea were slightly smaller than those from the North Sea. However, specimens with vaulted foreheads and no or only very few spinules on the posterior surfaces of the coxa of the P2-P4 were also found in the Northwest Atlantic, Southeast Atlantic, Southeast Pacific, and off southern New Zealand. For the latter, the distal outer edge of Exp3 of swimming leg 3 was serrated as in *P. indicus* (spinules very small in specimens from the Northwest Atlantic). Specimens with further characteristics (such as the spinules on the female genital segment) of *P. indicus* were found in all warm-temperate to tropical regions of the oceans.