2 **Fig. S1.** Day (D)-night (N) variations of ciliate (total, aloricate ciliate and tintinnid) abundance at
3 each depth in the nSCS and tWP. Black shadows: night.

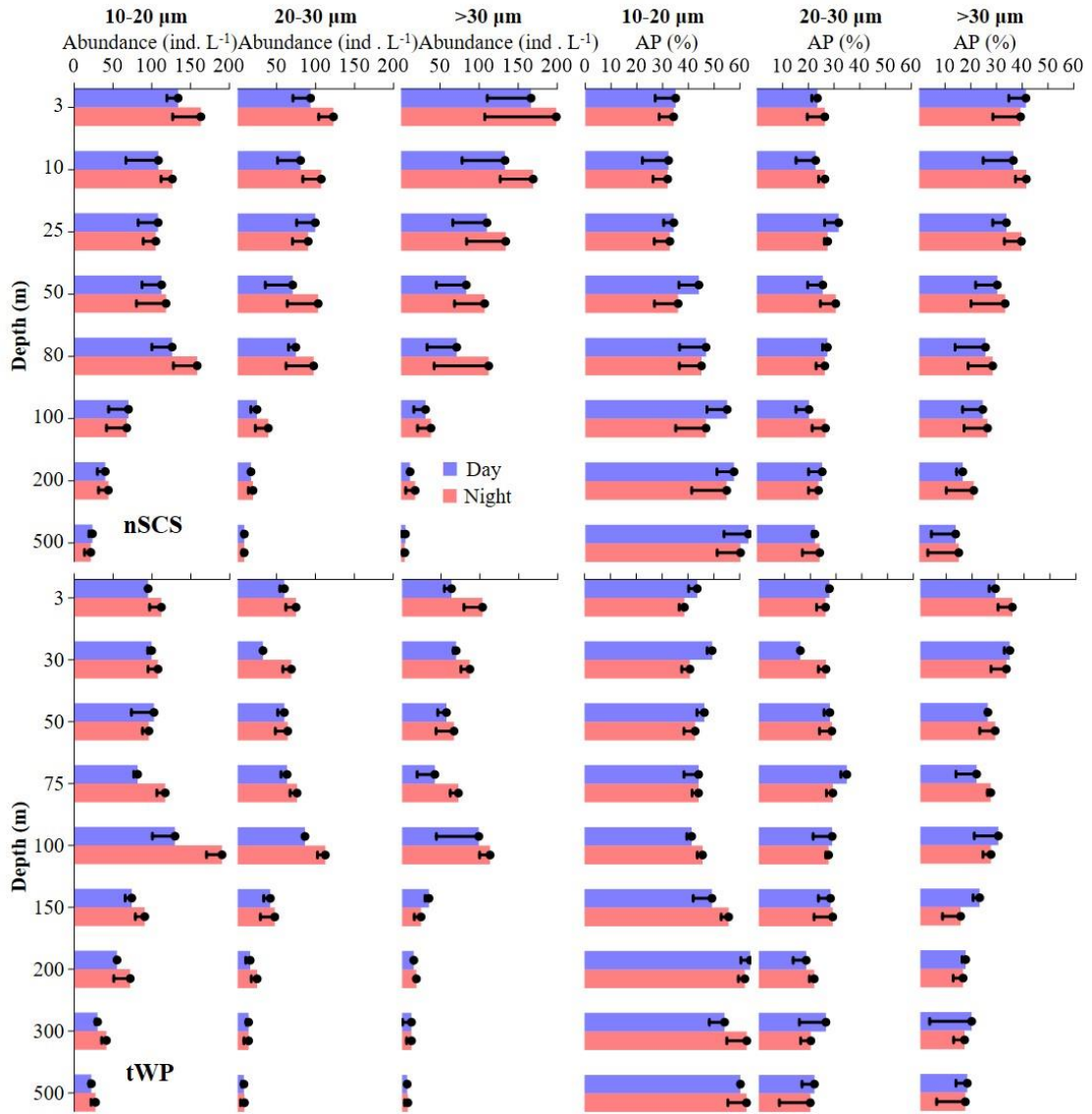
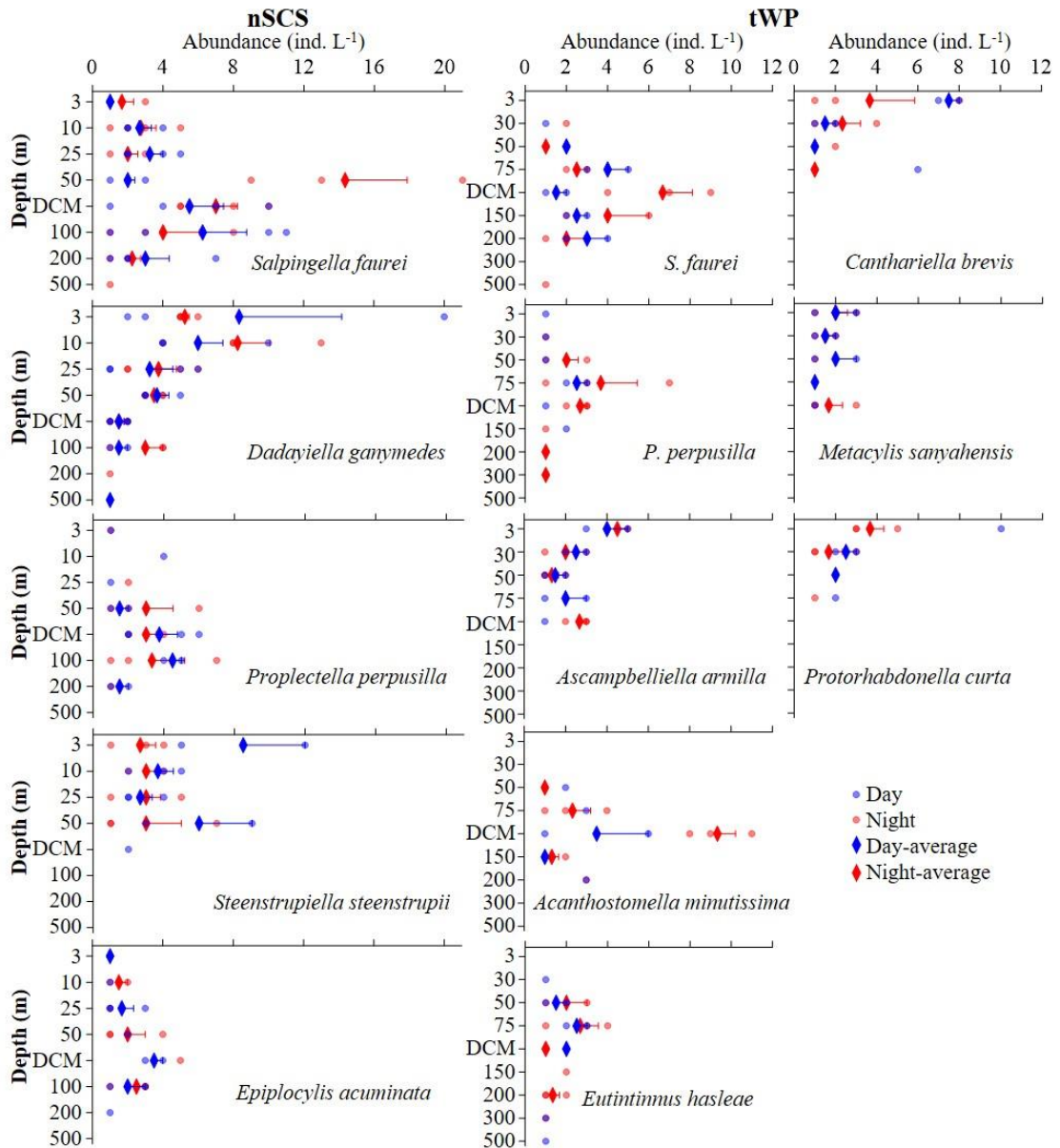
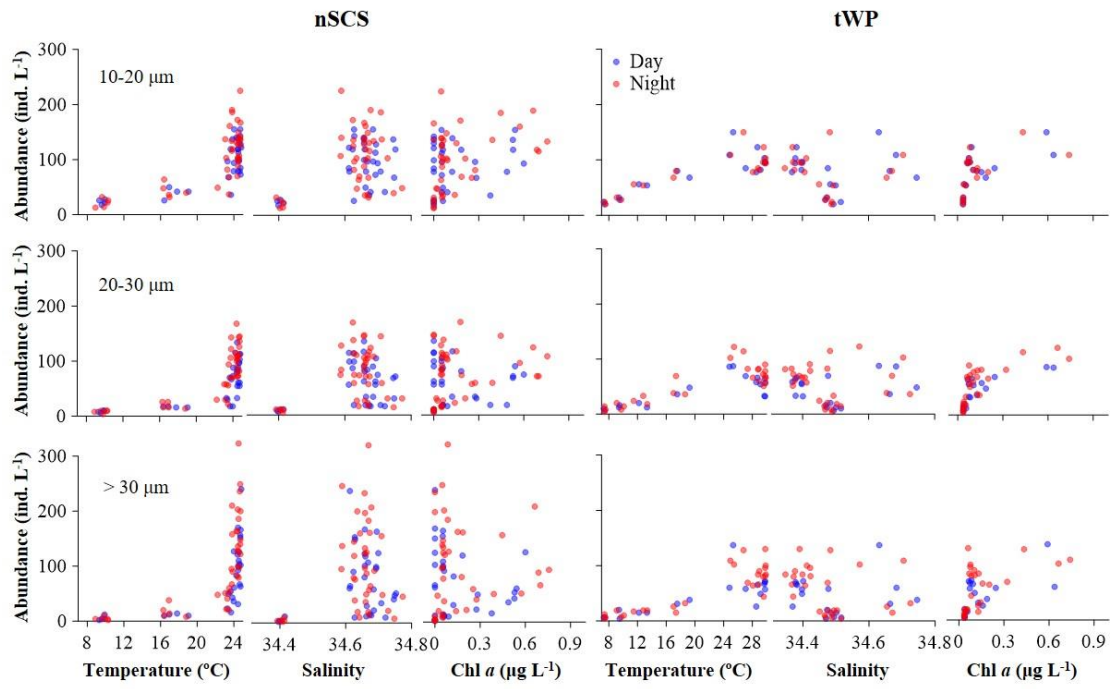



Fig. S2. Day-night variations of average abundance and abundance proportion (AP) of each aloricate ciliate size-fraction at each layers in the nSCS and tWP.

10

11 **Fig. S3.** Day-night variations of vertical distribution of tintinnid dominant species (average)

12 abundance from surface to 500 m in the nSCS and tWP.

13

14

15 **Fig. S4.** Relationship between aloricate ciliate abundance and temperature, salinity, Chl *a* in the

16 nSCS and tWP.

17

18

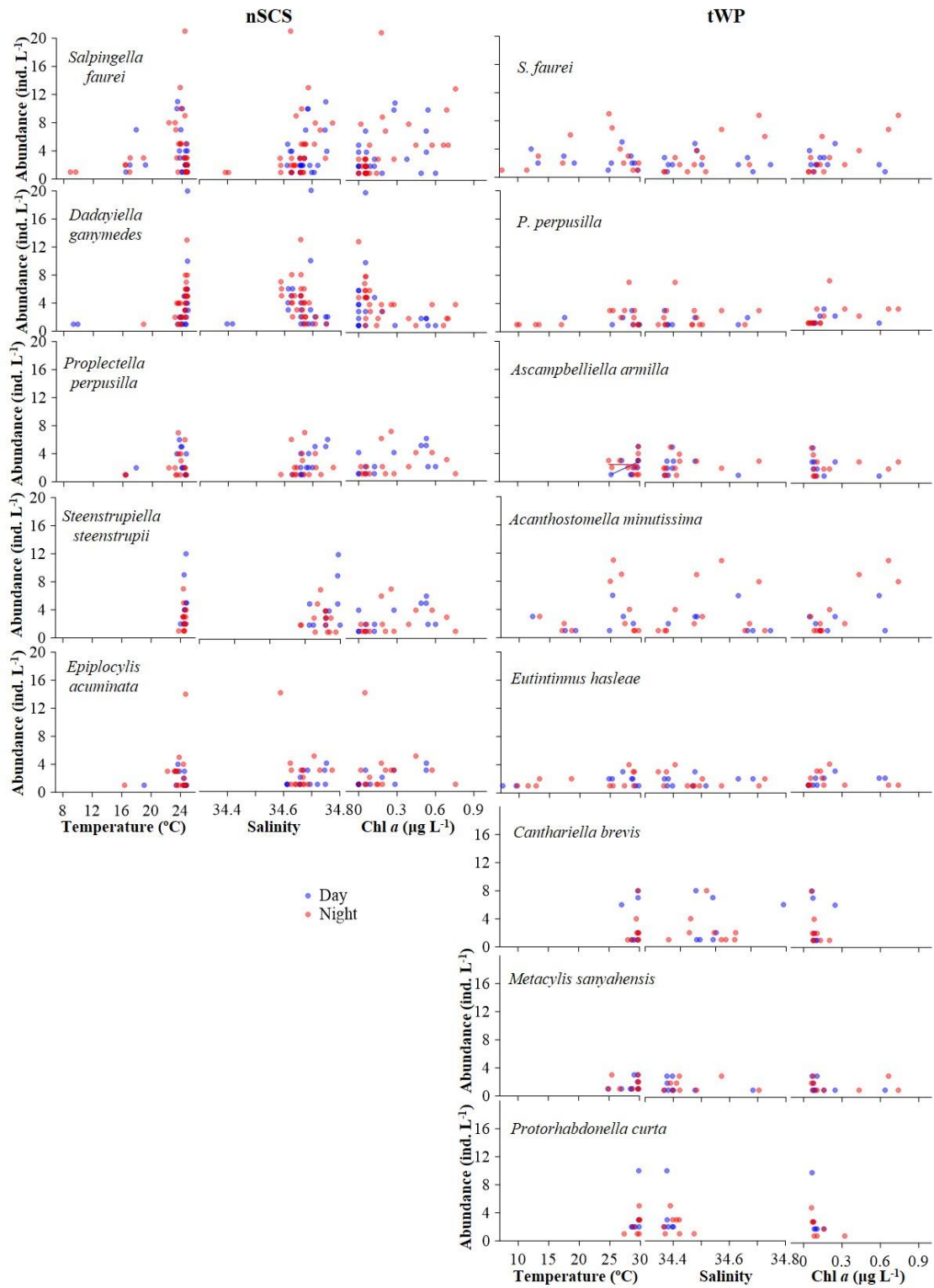



Fig. S5. Relationship between tintinnid dominant species abundance and temperature, salinity, Chl
a in the nSCS and tWP.

21

22

Table S1 Tintinnid species dimensions (LL: lorica length, μm; LOD: lorica oral diameter, μm), biogeography type (BT), maximum abundance (A_{max}, ind. L^{-1}), occurrence frequency (OF, %) and its dominance index (Y) at day and night in the northern South China Sea (nSCS) and tropical West Pacific (tWP).

Species	LL	LOD	BT	nSCS-Day			nSCS-Night			tWP-Day			tWP-Night		
				A_{max}	OF	Y	A_{max}	OF	Y	A_{max}	OF	Y	A_{max}	OF	Y
Acanthostomella conicoides	38.41 ±2.02	20.14 ±1.21	C	1	12.5	<0.01	4	15.00	<0.01	3	22.22	<0.01	8	22.22	<0.01
A. lata[*]	36.86 ±1.60	28.09 ±1.18	C	-	-	-	-	-	-	3	5.56	<0.01	5	7.41	<0.01
A. minutissim	25.58 ±3.14	18.84 ±1.11	C	-	-	-	-	-	-	**6**	**38.89**	**0.02**	**11**	**44.44**	**0.04**
Amphorellopsis acantharus	60.82 ±3.14	24.92 ±0.51	C	-	-	-	-	-	-	4	16.67	<0.01	7	14.81	<0.01
Amphorides amphora[*]	92.80 ±10.37	39.89 ±2.70	C	3	28.13	<0.01	4	20.00	<0.01	1	11.11	<0.01	1	22.22	<0.01
A. laackmanni[*]	86.93 ±8.72	25.90 ±0.96	C	-	-	-	2	5.00	<0.01	-	-	-	-	-	-
A. minor	69.78 ±2.01	36.10 ±1.19	C	1	3.13	<0.01	1	2.50	<0.01	1	11.11	<0.01	3	22.22	<0.01
A. quadrilineata	113.41 ±13.57	48.26 ±3.50	C	3	12.5	<0.01	4	15.00	<0.01	1	5.56	<0.01	2	7.41	<0.01
Ascampbelliella armilla	29.73 ±1.81	22.37 ±1.18	W	1	12.5	<0.01	4	12.50	<0.01	**5**	**50.00**	**0.04**	**5**	**44.44**	**0.03**
A. retusa[*]	33.65 ±3.46	30.00 ±0.96	W	-	-	-	4	5.00	<0.01	2	16.67	<0.01	4	18.52	<0.01
Brandtiella palliata[*]	146.75 ±4.35	46.26 ±2.46	W	-	-	-	-	-	-	-	-	-	2	11.11	<0.01
Canthariella brevis	64.94 ±3.11	29.69 ±1.66	W	2	9.38	<0.01	3	7.50	<0.01	**8**	**38.89**	**0.03**	8	33.33	<0.02
C. pyramidata[*]	52.71 ±2.20	27.46 ±0.79	W	-	-	-	1	2.50	<0.01	3	5.56	<0.01	1	14.81	<0.01
C. truncata[*]	49.08 ±2.47	27.57 ±1.06	W	-	-	-	-	-	-	-	-	-	1	3.70	<0.01
Climacocylis scalaria[*]	222.41 ±45.54	54.01 ±5.88	W	3	3.13	<0.01	1	7.50	<0.01	1	11.11	<0.01	-	-	-
Codonella grahami[*]	65.80 ±0.74	47.48 ±0.31	C	-	-	-	2	2.50	<0.01	-	-	-	-	-	-
Codonellopsis meridionalis[*]	182.71 ±10.47	58.91 ±1.19	C	-	-	-	-	-	-	1	5.56	<0.01	1	3.70	<0.01
C. morchella[*]	89.62 ±11.28	33.75 ±0.94	C	-	-	-	2	10.00	<0.01	-	-	-	-	-	-
C. robusta[*]	67.40 ±10.24	33.12 ±1.66	C	-	-	-	1	2.50	<0.01	1	5.56	<0.01	-	-	-
Coxliella laciniosa[*]	83.16 ±8.08	60.09 ±0.57	-	1	3.13	<0.01	-	-	-	1	11.11	<0.01	1	3.70	<0.01
Cyttarocylis acutiformis[*]	228.29	124.69	W	-	-	-	-	-	-	1	5.56	<0.01	-	-	-

Species															
Dadayiella ganymedes	92.40 ±12.87	28.95 ±1.85	C	**20**	**68.75**	**0.11**	**13**	**72.50**	**0.12**	2	27.78	<0.01	4	25.93	<0.01
D. pachytoecus*	96.72 ±4.04	32.23 ±1.52	C	1	6.25	<0.01	1	5.00	<0.01	-	-	-	-	-	-
Daturella striata*	244.36	59.58	W	1	3.13	<0.01	-	-	-	-	-	-	-	-	-
Dictyocysta reticulata	58.29 ±2.55	38.42 ±0.82	C	2	12.5	<0.01	9	15.00	<0.01	3	5.56	<0.01	1	3.70	<0.01
D. spinosa*	52.53 ±1.54	35.49 ±1.60	C	1	6.25	<0.01	1	7.50	<0.01	-	-	-	-	-	-
Epiplocylis acuminata	70.16 ±4.93	50.27 ±2.68	W	4	40.63	<0.02	**14**	**40.00**	**0.02**	1	16.67	<0.01	2	11.11	<0.01
E. constricta	109.09 ±7.59	59.65 ±1.40	W	2	12.5	<0.01	6	5.00	<0.01	-	-	-	1	11.11	<0.01
E. undella*	155.44 ±14.14	72.05 ±1.22	W	-	-	-	-	-	-	2	5.56	<0.01	-	-	-
Eutintinnus apertus	58.01 ±13.45	26.89 ±1.63	C	3	25	<0.01	4	30.00	<0.01	2	33.33	0.01	5	29.63	<0.01
E. fraknoii	248.43 ±27.90	46.46 ±1.94	C	1	15.63	<0.01	1	7.50	<0.01	2	22.22	<0.01	1	11.11	<0.01
E. hasleae	42.07 ±10.47	30.02 ±2.78	C	1	6.25	<0.01	-	-	-	**3**	**50.00**	**0.03**	**4**	**44.44**	**0.02**
E. lusus-undae	179.97 ±20.25	42.74 ±3.58	C	2	25	<0.01	6	30.00	<0.01	2	11.11	<0.01	2	18.52	<0.01
E. pacificus*	67.92 ±13.68	26.15 ±1.50	C	1	6.25	<0.01	-	-	-	2	11.11	<0.01	5	11.11	<0.01
E. stramentus*	165.01 ±20.05	24.66 ±1.42	C	-	-	-	1	2.50	<0.01	-	-	-	1	3.70	<0.01
E. tubulosus*	121.980	30.54	C	-	-	-	-	-	-	-	-	-	1	3.70	<0.01
Metacylis sanyahensis	24.90 ±4.53	23.53 ±1.48	C	-	-	-	1	2.50	<0.01	**3**	**50.00**	**0.02**	3	33.33	0.01
Ormosella bresslaui*	55.31	31.27	-	-	-	-	-	-	-	1	5.56	<0.01	-	-	-
Parundella aculeata	160.54 ±18.38	30.37 ±0.95	C	8	15.63	<0.01	4	25.00	<0.01	-	-	-	-	-	-
P. difficilis*	107.59 ±13.97	41.94 ±2.18	C	2	6.25	<0.01	1	2.50	<0.01	-	-	-	-	-	-
P. inflata	105.18 ±4.18	29.25 ±1.03	C	-	-	-	-	-	-	3	11.11	<0.01	7	18.52	<0.01
P. praetenuis*	124.25 ±2.93	32.68 ±0.17	C	4	3.13	<0.01	1	5.00	<0.01	-	-	-	-	-	-
Poroecus curtus*	62.46 ±1.07	28.11 ±0.91	W	1	3.13	<0.01	-	-	-	1	11.11	<0.01	-	-	-
Proplectella claparedei	67.11 ±2.87	43.52 ±2.01	W	-	-	-	1	2.50	<0.01	1	16.67	<0.01	1	14.81	<0.01
P. parva	56.38 ±2.93	27.77 ±0.61	W	7	9.38	<0.01	8	20.00	<0.01	1	5.56	<0.01	2	25.93	<0.01
P. perpusilla	44.62 ±4.67	28.78 ±0.72	W	**6**	**40.63**	**0.03**	**7**	**40.00**	**0.02**	3	38.89	0.01	**7**	**55.56**	**0.04**
P. urna*	33.12 ±2.59	14.90 ±0.68	W	1	6.25	<0.01	-	-	-	-	-	-	1	11.11	<0.01

Species	LL	LOD														
Protorhabdonella curta	42.15 ±5.14	28.70 ±1.78	C	1	3.13	<0.01	1	5.00	<0.01	**10**	**33.33**	**0.02**	5	29.63	0.01
P. simplex	54.15 ±3.19	33.68 ±1.00	C	2	9.38	<0.01	10	12.50	<0.01	1	27.78	<0.01	3	22.22	<0.01
Rhabdonella amor	87.19 ±2.94	46.40 ±1.77	W	1	9.38	<0.01	12	5.00	<0.01	-	-	-	1	7.41	<0.01
R. conica[*]	386.31	60.37	W	-	-	-	1	5.00	<0.01	-	-	-	-	-	-
R. cornucopia[*]	134.39 ±8.23	51.23 ±2.85	W	-	-	-	8	12.50	<0.01	-	-	-	-	-	-
R. elegans[*]	169.05	44.96	W	1	3.13	<0.01	-	-	-	-	-	-	-	-	-
R. exilis	67.07 ±5.14	28.63 ±1.51	W	2	3.13	<0.01	3	12.50	<0.01	1	22.22	<0.01	1	22.22	<0.01
R. poculum[*]	86.50 ±1.31	47.4 ±0.51	W	1	6.25	<0.01	12	5.00	<0.01	-	-	-	-	-	-
R. sanyahensis	131.57 ±7.66	37.63 ±6.19	W	2	12.5	<0.01	1	2.50	<0.01	-	-	-	-	-	-
Rhabdonellopsis apophysata	279.46 ±15.06	57.38 ±2.35	W	1	6.25	<0.01	-	-	-	2	5.56	<0.01	1	11.11	<0.01
Salpingella acuminata	250.35 ±50.31	30.35 ±3.28	C	5	15.63	<0.01	4	17.50	<0.01	2	27.78	<0.01	4	29.63	<0.01
S. curta	95.56 ±9.90	14.01 ±0.64	C	3	15.63	<0.01	5	20.00	<0.01	4	27.78	<0.01	3	29.63	0.01
S. decurtata[*]	147.27 ±16.45	17.33 ±1.85	C	4	18.75	<0.01	5	12.50	<0.01	1	27.78	<0.01	2	22.22	<0.01
S. faurei	121.11 ±15.72	13.05 ±0.87	C	**11**	**78.13**	**0.13**	**21**	**82.50**	**0.15**	**5**	**61.11**	**0.06**	**9**	**48.15**	**0.04**
S. minutissima[*]	77.51 ±7.73	13.33 ±0.52	C	-	-	-	2	5.00	<0.01	-	-	-	-	-	-
S. rotundata[*]	98.08 ±14.36	14.21 ±1.97	C	4	3.13	<0.01	1	2.50	<0.01	-	-	-	-	-	-
Steenstrupiella gracilis	76.77 ±3.67	31.48 ±1.93	C	4	34.38	<0.02	6	40.00	<0.02	3	33.33	<0.01	2	25.93	<0.01
S. intumescens	206.20 ±16.10	36.52 ±1.62	C	2	12.5	<0.01	2	7.50	<0.01	4	27.78	<0.01	3	14.81	<0.01
S. robusta	113.78 ±12.94	34.60 ±1.85	C	8	31.25	<0.02	6	12.50	<0.01	-	-	-	-	-	-
S. steenstrupii	153.72 ±12.03	35.07 ±1.58	C	**12**	**34.38**	**0.03**	**7**	**37.50**	**0.02**	2	22.22	<0.01	3	3.70	<0.01
Xystonellopsis brandti[*]	201.57 ±7.81	33.35 ±1.07	W	-	-	-	-	-	-	1	5.56	<0.01	1	3.70	<0.01
X. favata	233.88	61.79	W	-	-	-	1	2.50	<0.01	-	-	-	-	-	-

Note: The biogeography of tintinnid genera (e.g. cosmopolitan and warm water types) were derived according to Dolan et al. (2013); [*]: species with counting number <10; Species in bold black were regarded as dominant species in an assemblage with $Y \geq 0.02$; The LL and LOD were presented as mean values ± standard deviation. C: Composition; W: Warm Water; -: not classified in Dolan et al. (2013).

Table S2 Day-night variations in tintinnid species genera, species richness, biogeography type (BT) and its percentage (BTP, %) in the northern South China Sea (nSCS) and tropical West Pacific (tWP).

Seas	Day/Night	Genera	Species richness	BT			BTP		
				C	W	-	C	W	-
nSCS	Day	19	44	27	16	1	61.36	36.36	2.28
	Night	19	49	31	18	0	63.27	36.73	0
	All	23	57	34	22	1	59.65	38.6	1.75
tWP	Day	24	44	27	15	2	61.36	34.09	4.55
	Night	21	45	28	16	1	62.22	35.56	2.22
	All	25	51	29	20	2	56.86	39.22	3.92
Total		27	69	40	27	2	57.97	39.13	2.9