

## Supplementary materials

Seasonal migration of the snailfish *Liparis tanakae* and the habitat overlap with 0-year-old Japanese flounder *Paralichthys olivaceus*

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Fig. S1 Photograph of *Liparis tanakae*.

Fig. S2 Map of the study area.

Fig. S3 Water temperature.

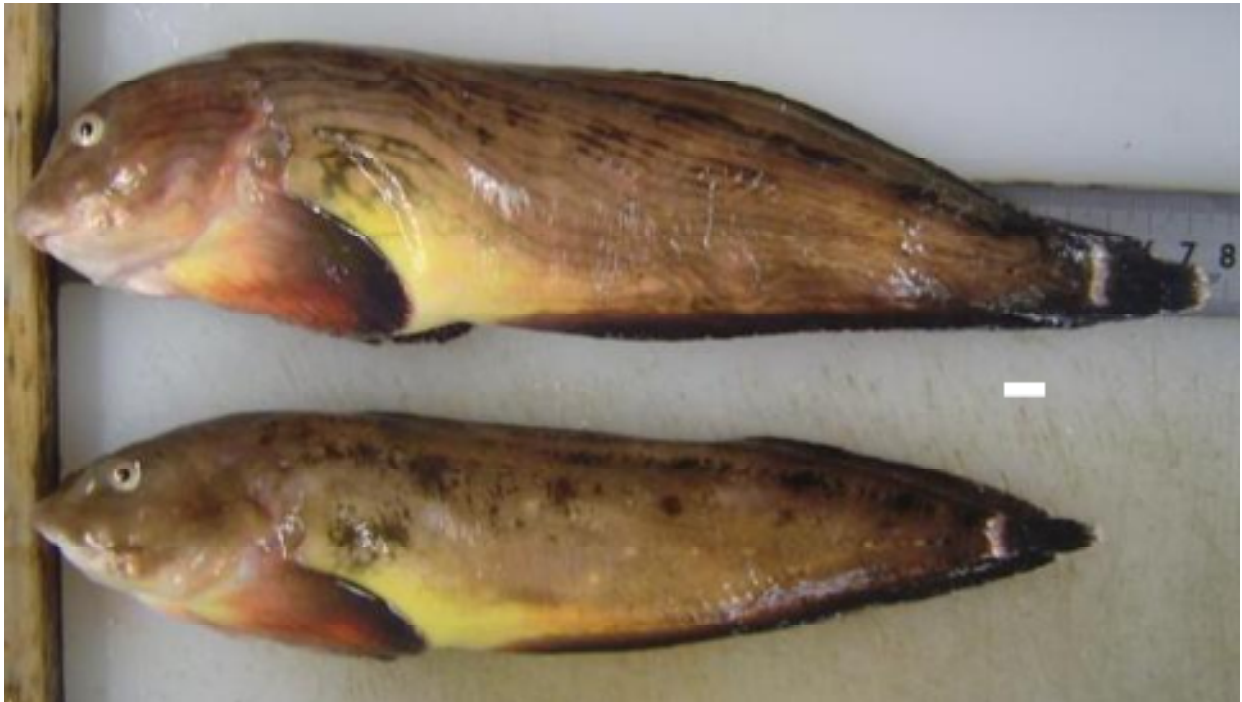
Fig. S4 TL of *Liparis tanakae*.

Fig. S5 Relationships between depth and TL of *Liparis tanakae*.

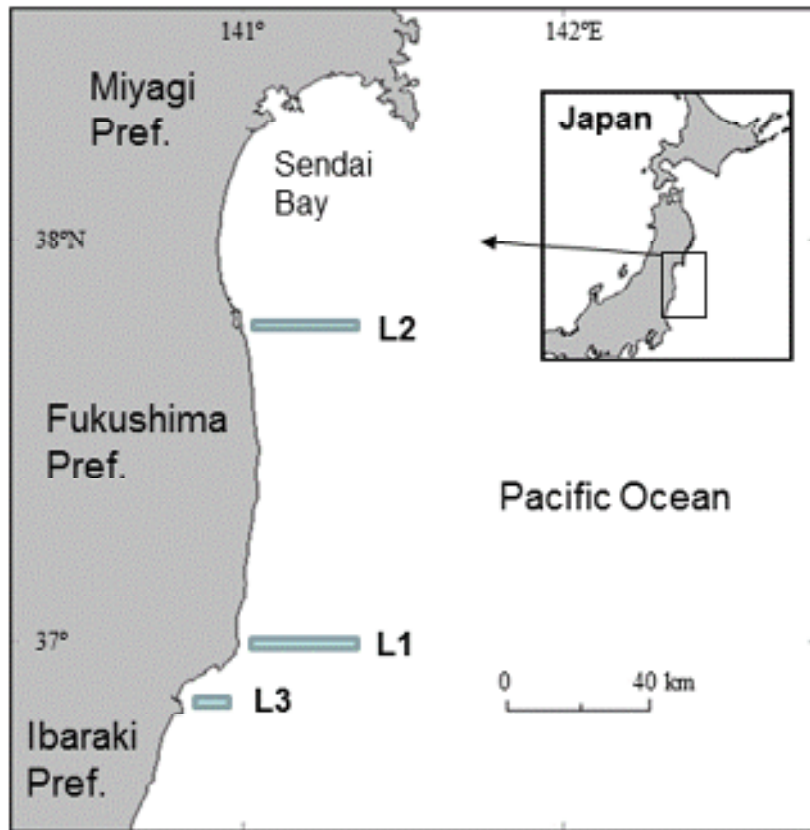
Fig. S6 Diet of *Liparis tanakae*.

Fig. S7 Stomach contents index of *Liparis tanakae*.

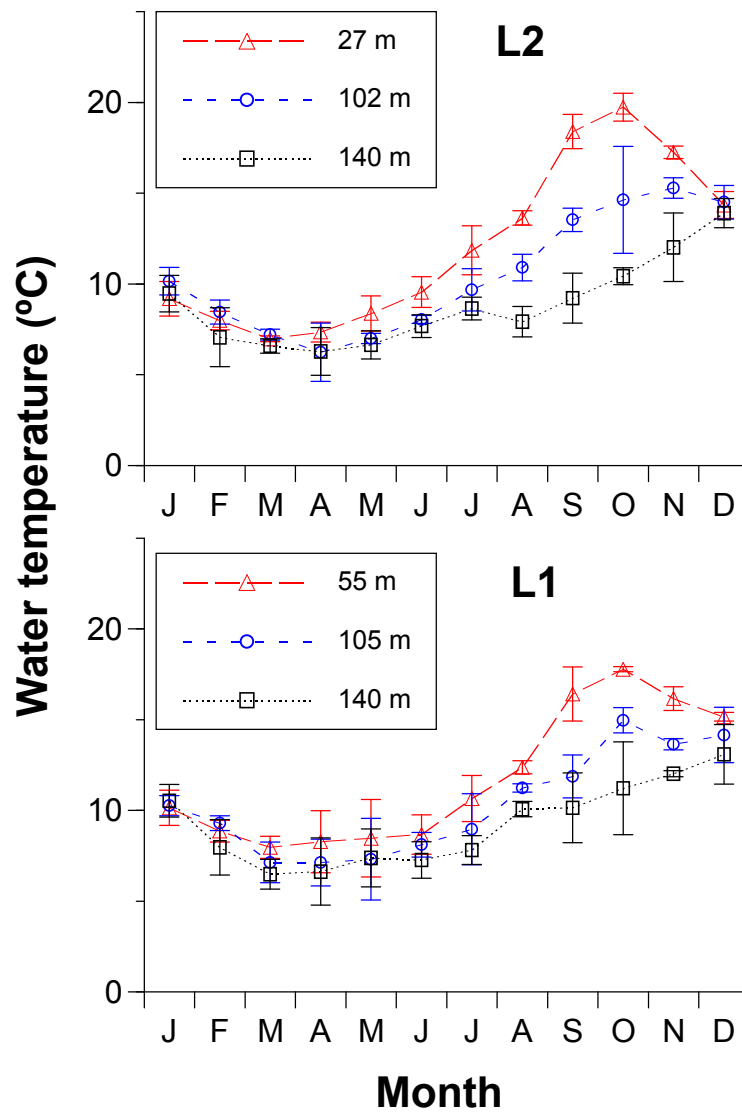
Table S1 List of the diet of *Liparis tanakae*.



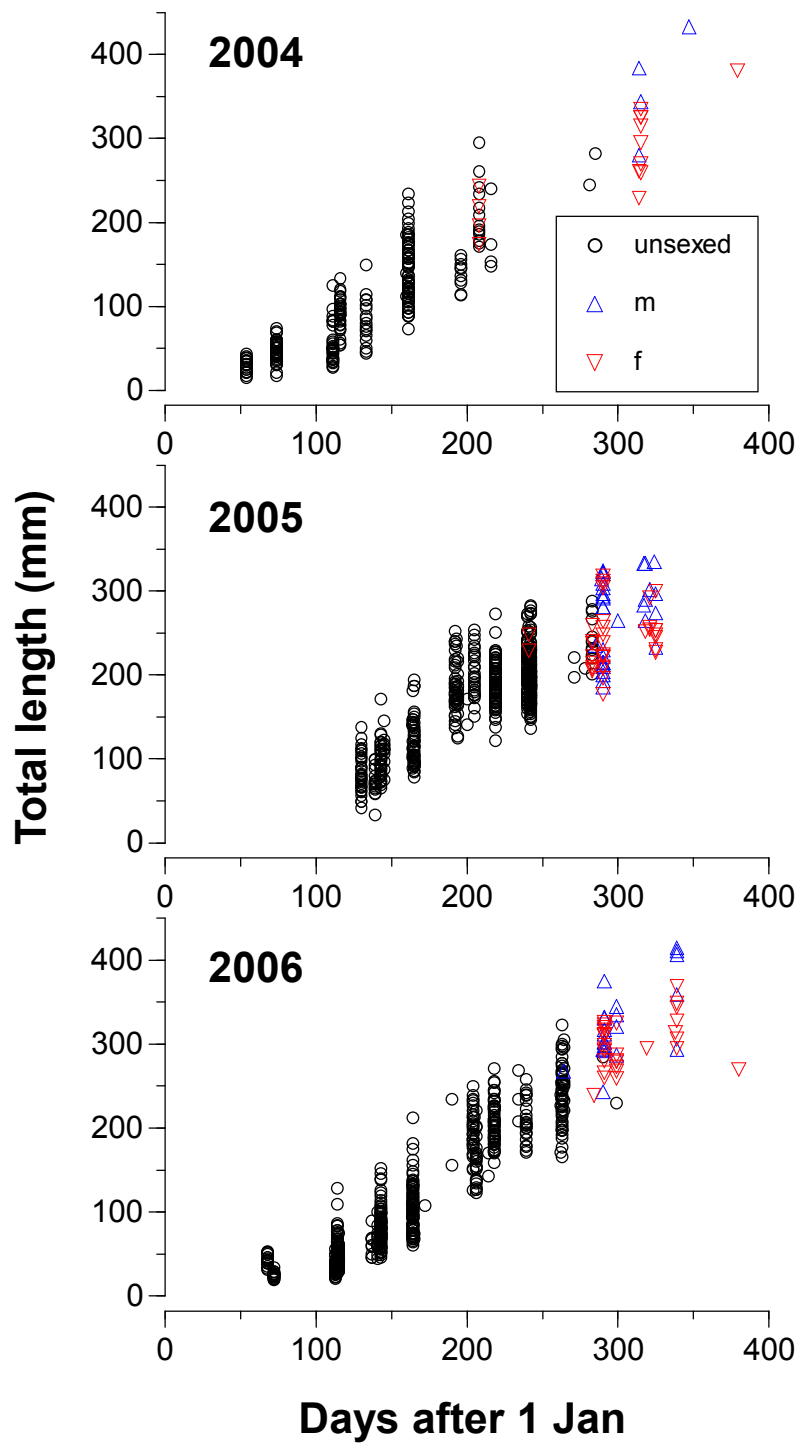
**Fig. S1** Photograph of *Liparis tanakae* collected from a depth of 100 m in November 2005. Scale bar shows 1 cm.



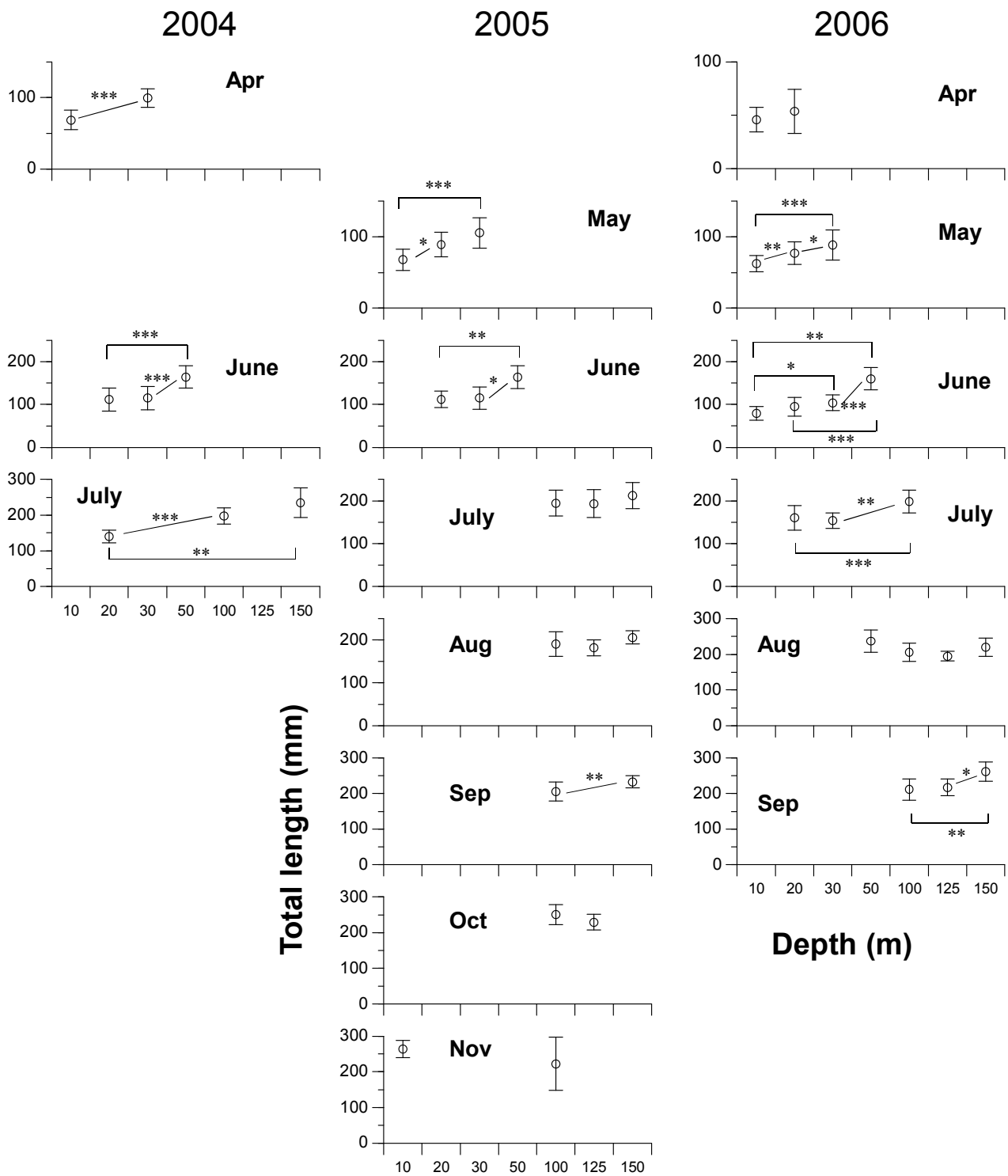
**Fig. S2** Map of the study area. Samples for seasonal migration patterns of *Liparis tanakae* and 0-year-old *Paralichthys olivaceus* were collected along L1 (37° 00' N), and additional samples for diet analysis of *L. tanakae* were also collected along L2 (37° 50' N) and L3 (36° 50' N).



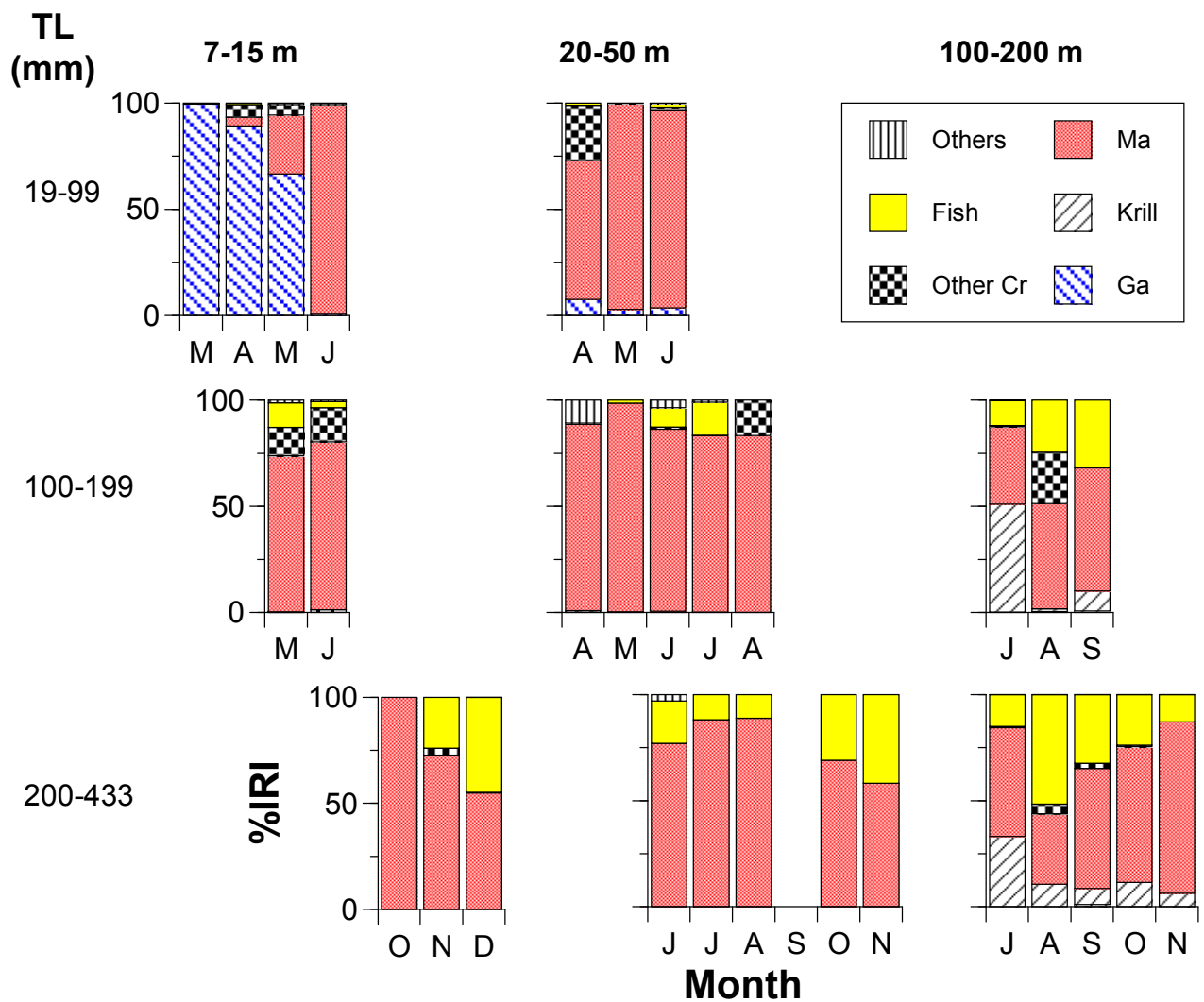
**Fig. S3** Bottom water temperature measured monthly with a Conductivity Temperature Depth profiler at six stations along L1 and L2. Data were averaged between years of 2004, 2005 and 2006. Vertical bars denote SD.



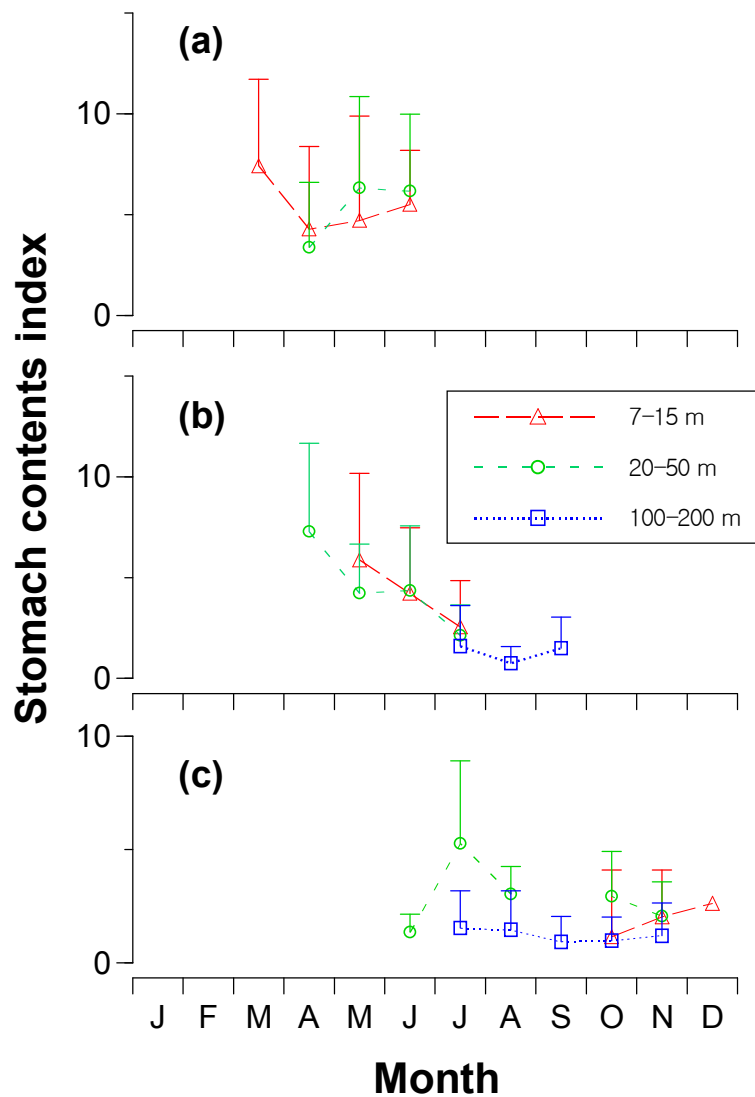
**Fig. S4** Temporal changes in the total length of *Liparis tanakae* in 2004, 2005 and 2006. Days after January 1 of each year were used as x-axis. Samples with >100 mm TL collected in January were included in the data in previous year, because *L. tanakae* has a one-year life span and its spawning season is supposed to be from December to January.



**Fig. S5** Relationships between habitat depth and the total length of *Liparis tanakae*. Data with <3 individuals at each depth were eliminated. Data were shown by mean  $\pm$  SD. Samples of individuals collected by otter trawls were used for the analysis. Data were compared between depths by Steel-Dwass test: \*  $p < 0.05$ , \*\*  $p < 0.01$ , and \*\*\*  $p < 0.001$ .



**Fig. S6** The index of relative importance of stomach contents of each of three size class of *Liparis tanakae* at each depth class at each month. Abbreviations are: Ga, gammarid, Ma, macruran, and Cr, crustacean.



**Fig. S7** Seasonal changes in the stomach contents index (SCI) of *Liparis tanakae* at each depth class: (a) samples at the size class of 19–99 mm, (b) at 100–199 mm, and (c) at 200–433 mm TL. Data with <3 individuals were eliminated. Data were shown by mean + SD.  $SCI = SCW \times (BW - SCW)^{-1} \times 100$ , where SCW is the total stomach content weight and BW is the body weight. SCI was determined for all samples, including those with empty stomachs.



**Table S1** List of observation on consumption of 0-year-old flatfishes by *Liparis tanakae* throughout the survey. Japanese flounder *Paralichthys olivaceus* were identified as wild or hatchery-reared (HR) fish based on hypermelanosis. TL of prey was shown by the range when multiple prey were observed from each stomach.

Prey	Month and year	Depth (m)	TL of snailfish (mm)	N	TL of prey (mm)
Japanese flounder (HR)	Nov 2004	7	384	1	124
(HR)	Dec 2004	7	433	1	-
(wild)	Sep 2005	9	221	1	45
(wild)	Nov 2005	7	290	2	97–98
Stone flounder	June 2004	10	167	1	50
	June 2004	10	159	1	33
	June 2004	20	193	1	-
	May 2005	7	106	1	-
	June 2005	20	95	1	-
Littlemouth flounder	June 2004	30	185	1	24
Red tongue sole	Dec 2006	10	295	6	-
	Dec 2006	10	294	2	-
	Dec 2006	10	344	3	-
	Dec 2006	10	306	4	-
	Dec 2006	10	359	13	-
	Dec 2006	10	369	1	-
	Dec 2006	10	415	7	-
	Dec 2006	10	411	2	-
	Dec 2006	10	328	4	35–73
Unidentified flatfish	June 2004	30	185	3	39–45
	Sep 2006	100	323	1	52
	Oct 2006	30	287	1	-