HOKKAIDO UNIVERSITY

Title	Estimation of Gillnet Selectivity Curve by Maximum
Author(s)	Fujimori, Yasuzumi; 藤森, 康澄; Tokai, Tadashi
Citation	Fisheries Science, 67(4), 644-654 https://doi.org/10.1046/j.1444-2906.2001.00301.x
Issue Date	2001-08
Doc URL	https://hdl.handle.net/2115/622
Rights	Copyright (c) 2001 the Japanese Society of Fisheries Science (日本水産学会)
Type	journal article
File Information	TableAndFigure.pdf, 図表

Hokkaido University Collection of Scholarly and Academic Papers : HUSCAP

Table 1 Frequency distribution of fork length of pink salmon caught (Ishida[6])

Length class, l_j	Mesh size, m_i (cm)						
(cm)	7.6	9.6	10.6	12.1	12.7	13.6	Total
41.5	15	60	57	18	0	5	155
42.5	21	103	160	42	1	4	331
43.5	23	100	190	72	1	9	395
44.5	10	84	198	135	2	11	440
45.5	7	40	135	158	2	9	351
46.5	5	29	2	133	6	7	182
47.5	0	18	11	100	2	13	144
Number of net used, x_i	70	98	136	331	71	209	915
Relative catch effort $(x_i / \Sigma_i x_i)$	0.077	0.107	0.149	0.362	0.078	0.228	

Table 2 The parameters of master curve of selectivity and the values of model deviance

Model		Parameters										MLL	d.f.	Model deviance
		$R_0(R_a, R_b)^2$	σ	η^1, ω^2	δ^2	p_1	p_2	p_3	p_4	p_5	p_6			
Normal														
	p_i estimated	4.1108	0.4612	-	-	0.9161	0.0226	0.0228	0.0294	0.0010	0.0081	-2538.6	29	428.0
	p_i fixed	4.5487	0.5478	-	-	0.0765	0.1071	0.1486	0.3617	0.0776	0.2284	-2647.2	34	617.7
Lognormal														
	p_i estimated	4.3378	0.1026	-	-	0.3183	0.0561	0.0935	0.2745	0.0132	0.2444	-2505.2	29	337.8
	p_i fixed	4.4310	0.1218	-	-	0.0765	0.1071	0.1486	0.3617	0.0776	0.2284	-2586.0	34	528.9
Skew-normal														
	p_i estimated	4.2290	0.4375	1.1401	-	0.7385	0.0508	0.0571	0.0984	0.0038	0.0514	-2512.9	28	354.7
	p_i fixed[3]	-	-	-	-	0.0765	0.1071	0.1486	0.3617	0.0776	0.2284	-	33	-
Bi-normal														
	p_i estimated	4.0638 4.7719	0.2141 0.6397	0.2662	1.1370	0.1222	0.1380	0.0913	0.2742	0.0181	0.3562	-2427.0	25	115.6
	p_i fixed	4.0575 4.8084	0.2111 0.6331	0.6744	1.3393	0.0765	0.1071	0.1486	0.3617	0.0776	0.2284	-2470.6	30	228.9

[1] The parameter of skew-normal model.

[2] The parameter of bi-normal model.

[3] Parameters were not converged.

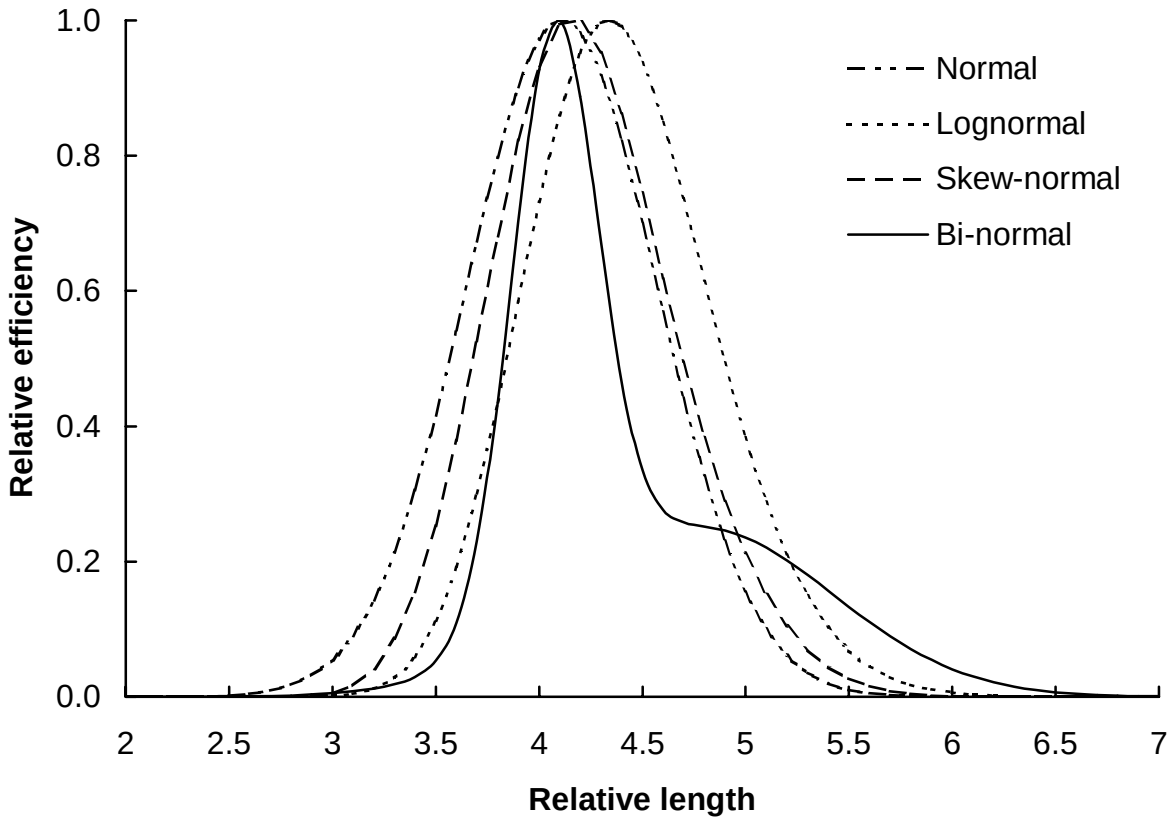
1.0
0.8
0.6
0.4
0.2
0.0
Relative efficiency
2
2.5
3
3.5
4
4.5
5
5.5
6
6.5
7
Relative length
Normal
Lognormal
Skew-normal
Bi-normal

Fig. 1

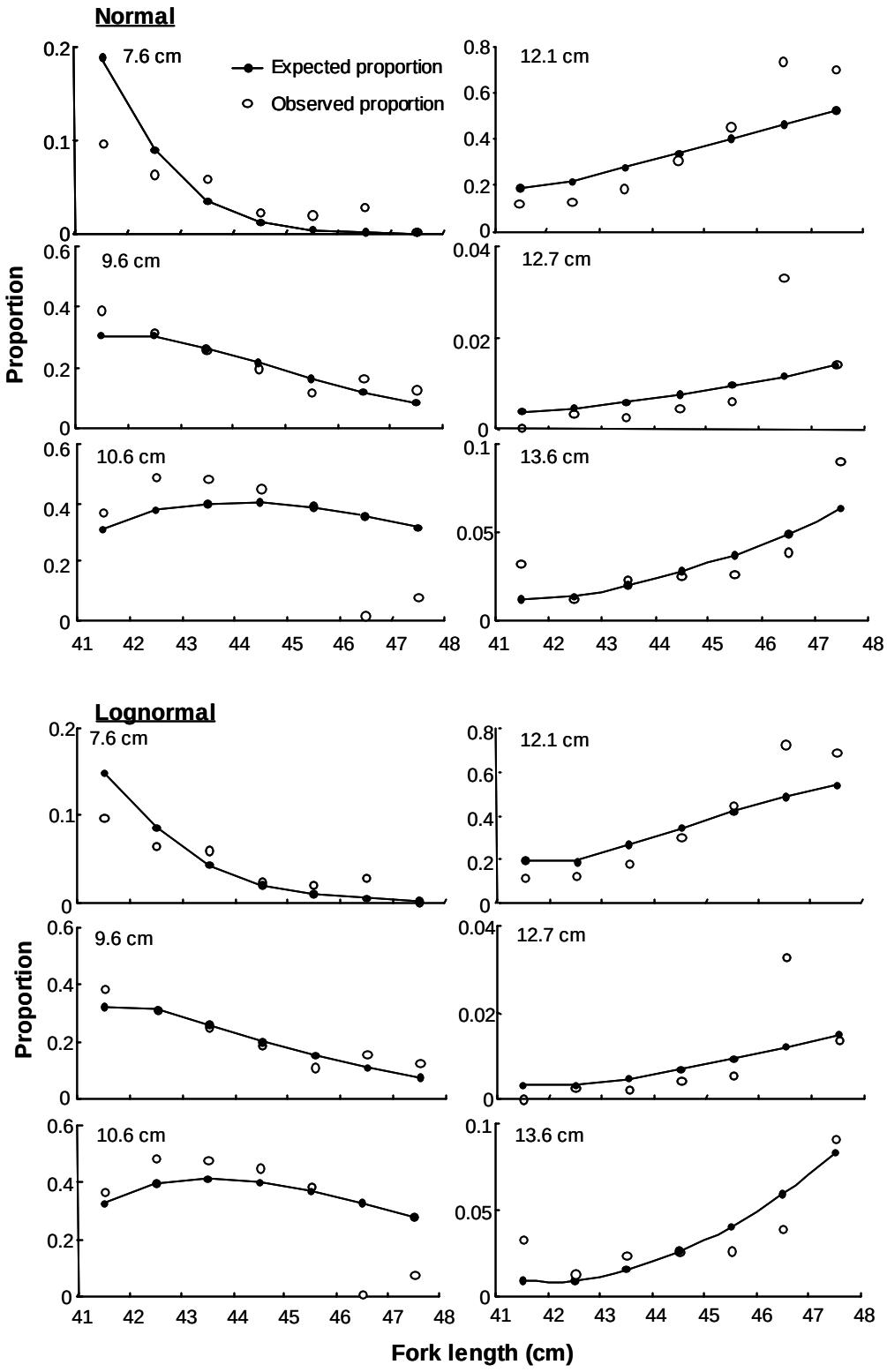
Normal
7.6 cm
Expected proportion
Observed proportion
12.1 cm
9.6 cm
12.7 cm
10.6 cm
13.6 cm
Proportion
Lognormal
7.6 cm
12.1 cm
9.6 cm
12.7 cm
10.6 cm
13.6 cm
Proportion
Fork length (cm)

Fig. 2(a)

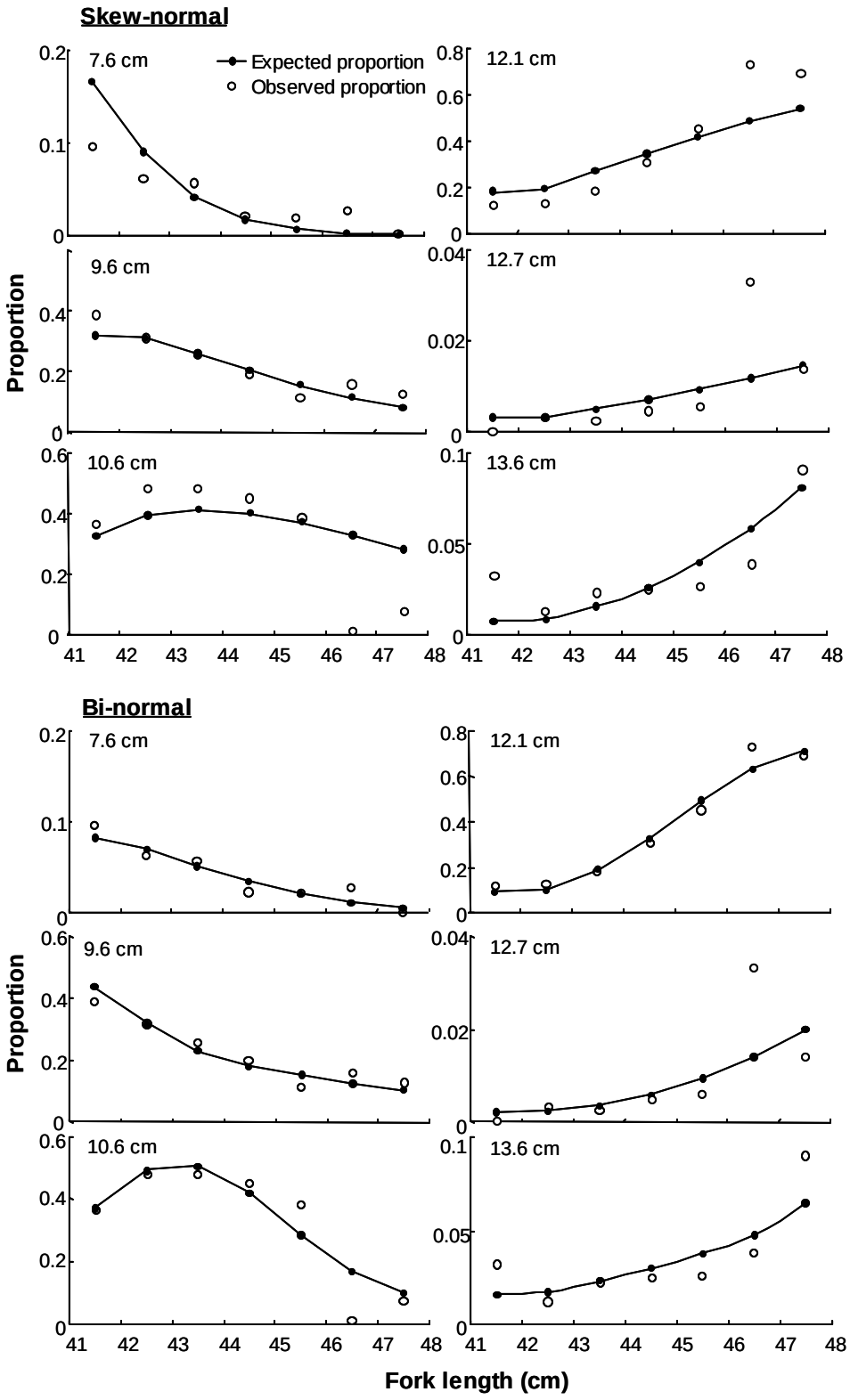
Skew-normal
7.6 cm
Expected proportion
Observed proportion
12.1 cm
9.6 cm
12.7 cm
10.6 cm
13.6 cm
Proportion
Bi-normal
7.6 cm
12.1 cm
9.6 cm
12.7 cm
10.6 cm
13.6 cm
Proportion
Fork length (cm)

Fig. 2(b)

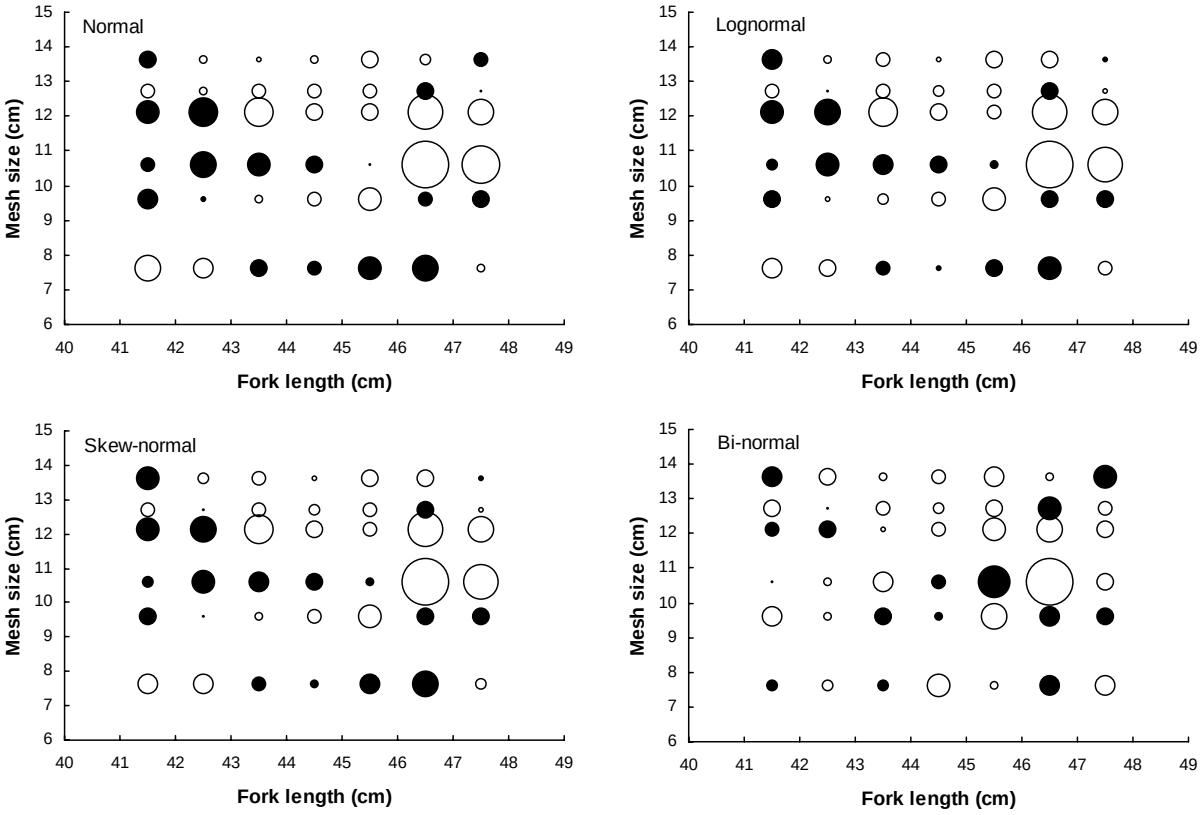
Normal
Lognormal
Skew-normal
Bi-normal
Mesh size (cm)
Fork length (cm)
6
7
8
9
10
11
12
13
14
15
40
41
42
43
44
45
46
47
48
49

Fig. 3

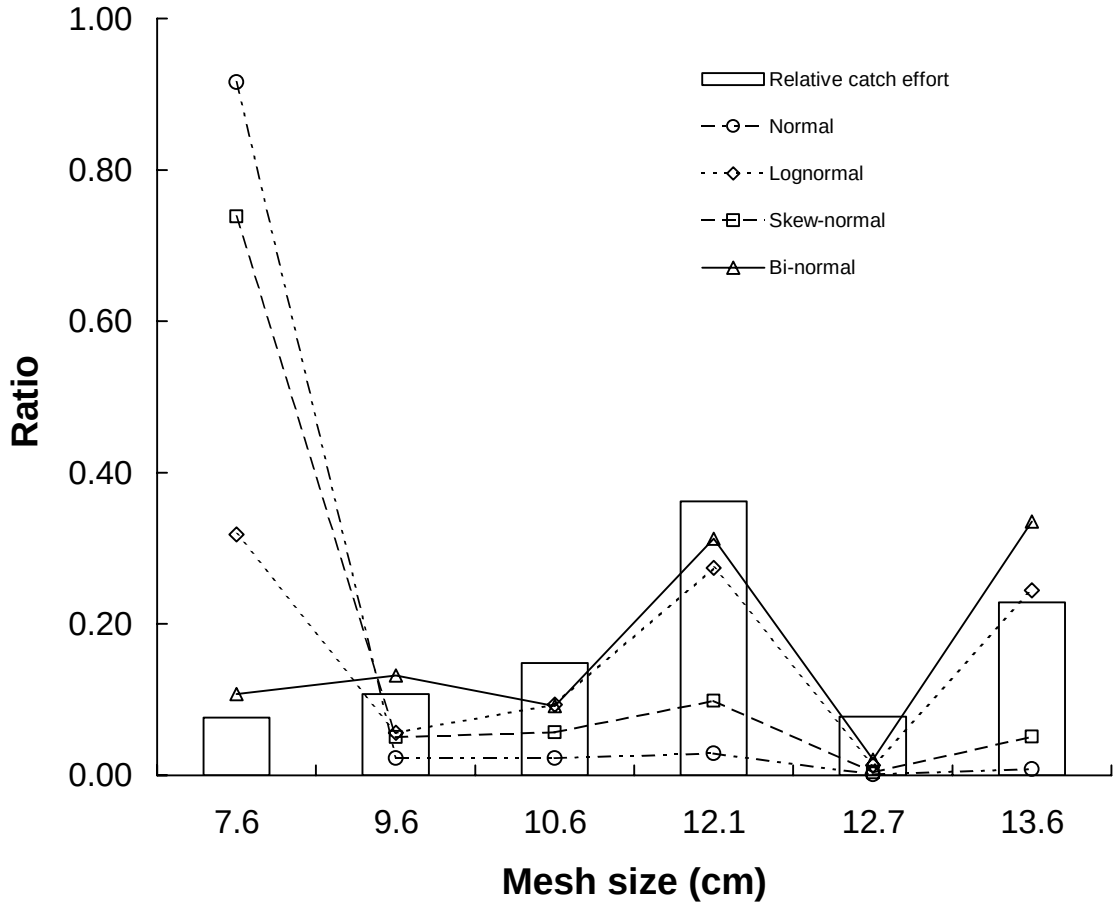
1.00
0.80
0.60
0.40
0.20
0.00
Ratio
Relative catch effort
Normal
Lognormal
Skew-normal
Bi-normal
7.6
9.6
10.6
12.1
12.7
13.6
Mesh size (cm)

Fig. 4

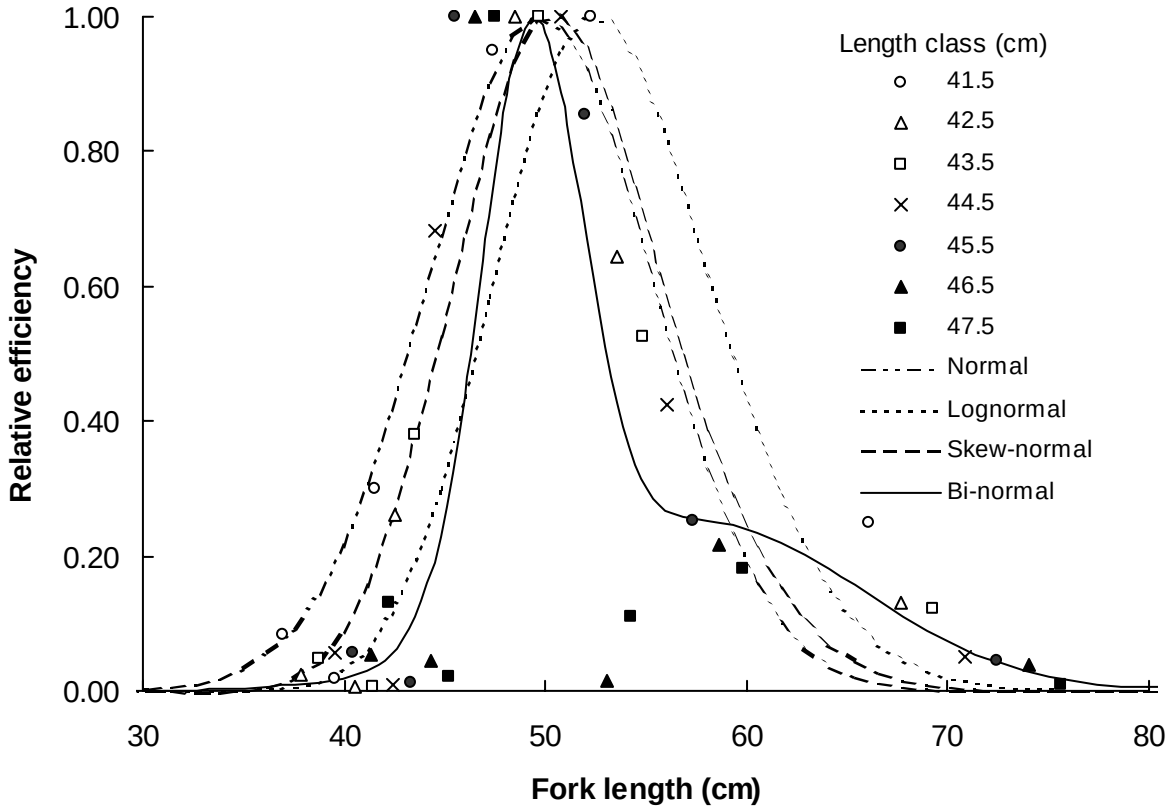
1.00
0.80
0.60
0.40
0.20
0.00
Relative efficiency
30
40
50
60
70
80
Fork length (cm)
Length class (cm)
41.5
42.5
43.5
44.5
45.5
46.5
47.5
Normal
Lognormal
Skew-normal
Bi-normal

Fig. 5