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Korean SBT otolith collection activities in 2019

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ABSTRACT

To investigate the age and growth of southern bluefin tuna (SBT) we collected 174 otolith samples in 2019, totally 745 otoliths since 2015. The relationship between fork length and total weight was $TW = 7.4E\text{-}05 \times FL^{2.731}$ ($R^2 = 0.873$). The von Bertalanffy growth's parameters estimated were $L_\infty = 170.5$ cm, $K = 0.197$/year, $t_0 = -1.668$ years.

1. Sampling activities of otolith and ovary and its process

Since 2015 a total of 745 otoliths of SBT have been collected by Korean scientific observer program (Fig. 1). The fork length and weight were measured onboard for each specimen by sex, and the age was determined from annuli in otolith, based on the CCSBT manual (CCSBT, 2002). We analyzed the relationship between fork length (FL) and total weight (W), and estimated the von Bertalanffy growth equation (1938).

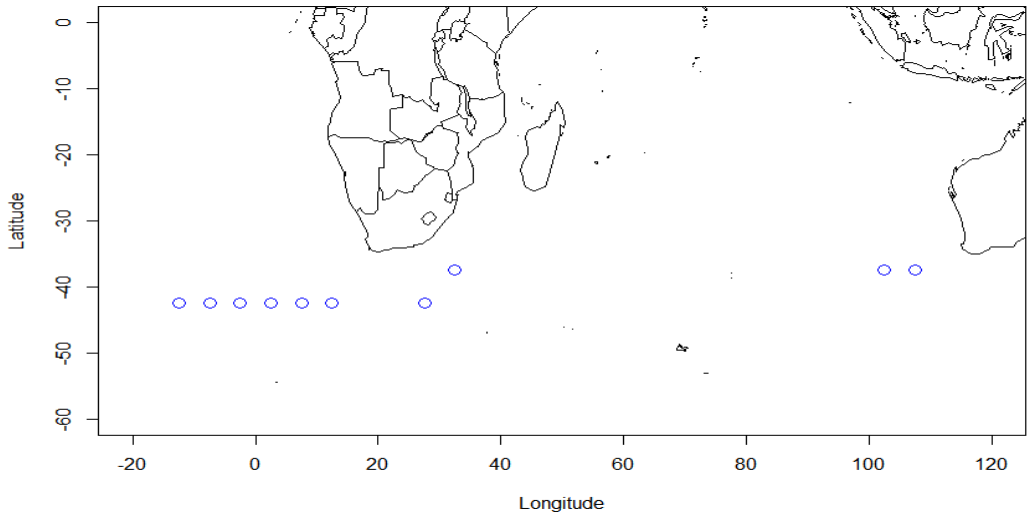

Fig. 1. Map showing the sampling area of SBT otoliths collected by Korean scientific observer program during 2015-2019.

2. Analysis of age and growth using otolith

The SBT otolith samples were collected from April to September during 2015-2019. The length distributions collected for analyzing age of SBT are shown in Table 1. The length ranged from 66 cm to 181 cm with a mean of 134.3 cm in fork length (FL).

Table 1. Length distributions of SBT collected by Korean observer programs

(a) 2015-2019

Month	Area 8			Area 9			Total		
	No. samples	Range of FL (cm)	Mean FL (cm)	No. samples	Range of FL (cm)	Mean FL (cm)	No. samples	Range of FL (cm)	Mean FL (cm)
Apr				209	100-165	136.0	209	100-165	136.0
May				153	97-174	141.8	153	97-174	141.8
Jun				182	95-176	134.4	182	95-176	134.4
Jul				92	107-181	132.1	92	107-181	132.1
Aug	68	66-178	127.6	9	109-127	115.4	77	66-178	126.2
Sep	32	86-168	135.2				32	86-168	135.2
Total	100	66-178	130.0	645	95-181	136.1	745	66-181	134.3

(b) 2019

Month	Area 8			Area 9			Total		
	No. samples	Range of FL (cm)	Mean FL (cm)	No. samples	Range of FL (cm)	Mean FL (cm)	No. samples	Range of FL (cm)	Mean FL (cm)
Apr				117	100-162	130.0	117	100-162	130.0
May				30	109-163	139.5	30	109-163	139.5
Jun				26	117-160	129.0	26	117-160	129.0
Jul				1	117-117	117.0	1	117-117	117.0
Total				174	100-163	131.4	174	100-163	131.4

The relationship between fork length and total weight is shown in Fig. 2, which was W = 7.4E-05 x $FL^{2.731}$ (R^2 = 0.873).

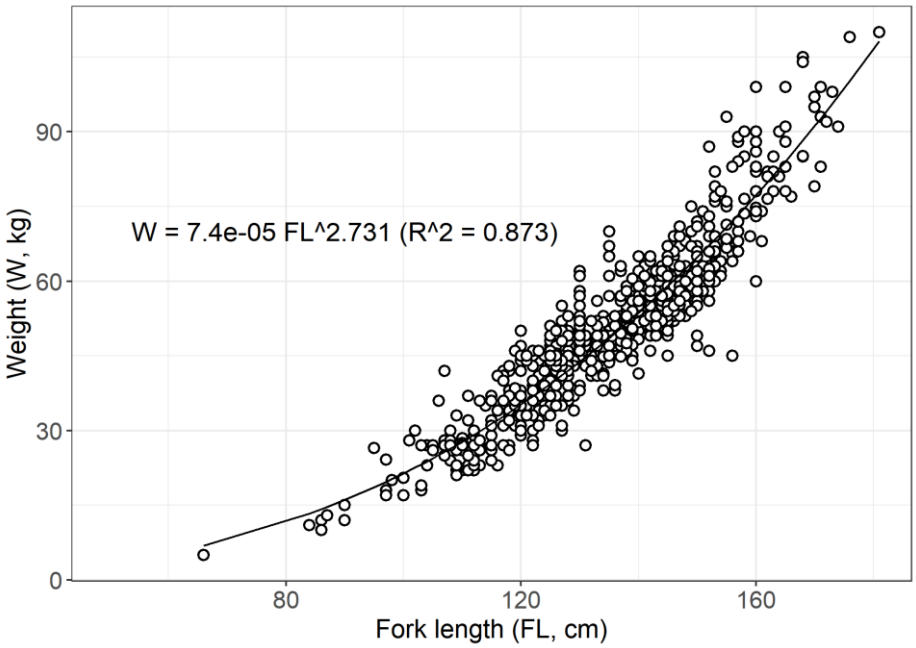

Fig. 2. Relationship between fork length and total weight of SBT collected during 2015-2019.

The von Bertalanffy's growth parameters estimated by a non-linear method were L_∞ = 170.5 cm, K = 0.197/year, t_0 = -1.668 years (Fig. 3).

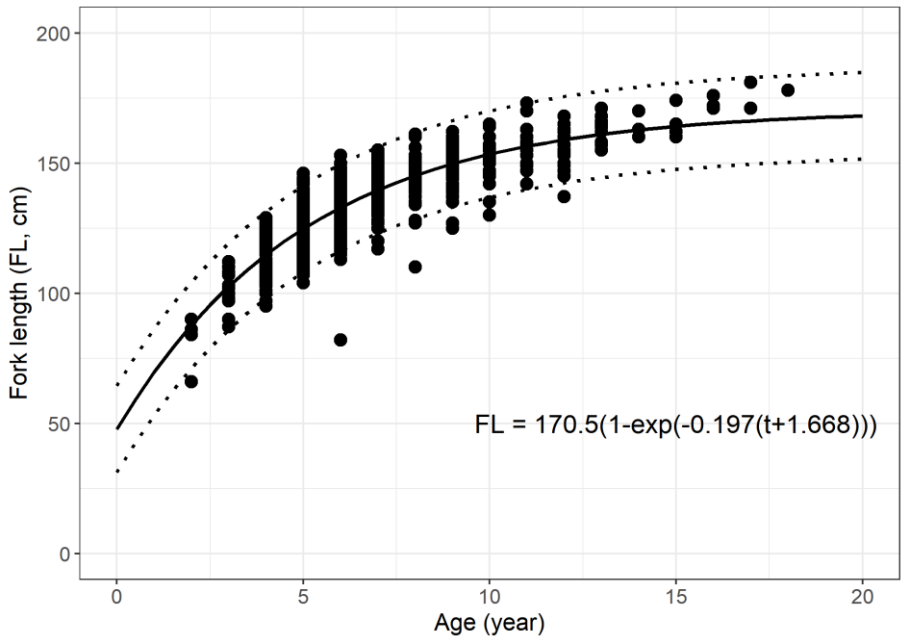

Fig. 3. The von Bertalanffy growth curve of SBT.

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