

Korean SBT otolith and ovary collection activities in 2017

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ABSTRACT

To investigate the age and growth of southern bluefin tuna (SBT) we collected 146 otolith samples in 2017, totally 444 otoliths since 2015. The relationship between fork length and total weight was $TW = 2E-05 \times FL^{2.9844}$ ($R^2 = 0.9281$). The von Bertalanffy growth's parameters estimated were $L_{\infty} = 178.0$ cm, $K = 0.173/\text{year}$, $t_0 = -1.829$ years. In addition, we have collected 297 gonad samples of SBT since 2015, and are analyzing the gonadosomatic index (GSI), maturity stages, fecundity, etc.

1. Sampling activities of otolith and ovary and its process

Since 2015 a total of 444 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 (TW), and estimated the von Bertalanffy growth equation (1938).

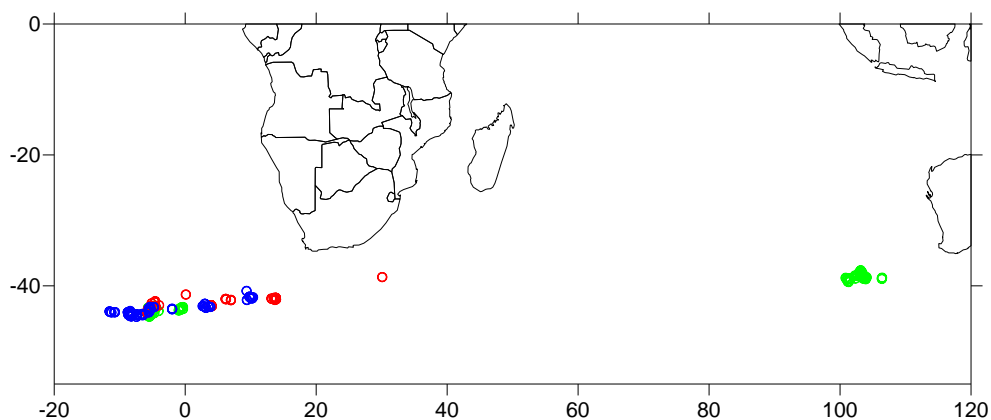


Fig. 1. Map showing the sampling area of SBT otoliths collected by Korean scientific observer program during 2015-2017 (green : 2015, red : 2016, blue : 2017).

In addition, a total of 297 ovaries of SBT has been collected by observers since 2015 and has been analyzing. Currently, we are analyzing SBT samples of ovaries in 2017, but the condition of the tissue is not good and we are in the process of finalizing it with the results for the last two years. In 2019, the results will be summarized and presented as a preliminary report.

2. Analysis of age and growth using otolith

The SBT otolith samples were collected from April to September during 2015-2017. The length distributions collected for analyzing age of SBT are shown in Table 1. The length ranged from 66 cm to 178 cm with a mean of 134.6 cm in fork length (FL).

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

(a) 2015-2017

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				65	126-165	143.5	65	126-165	143.5
May				77	97-174	142.6	77	97-174	142.6
Jun				117	95-163	134.2	117	95-163	134.2
Jul				76	107-168	127.6	76	107-168	127.6
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	344	95-174	135.9	444	66-178	134.6

(b) 2017

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				20	135-160	143.5	20	135-160	143.5
May				46	97-168	142.7	46	97-168	142.7
Jun				54	95-155	140.6	54	95-155	140.6
Jul				20	107-146	127.8	20	107-146	127.8
Aug				6	112-127	117.8	6	112-127	117.8
Total				146	95-168	139.0	146	95-168	139.0

The relationship between fork length and total weight is shown in Fig. 2, which was $TW = 2E-05 \times FL^{2.9844}$ ($R^2 = 0.9281$).

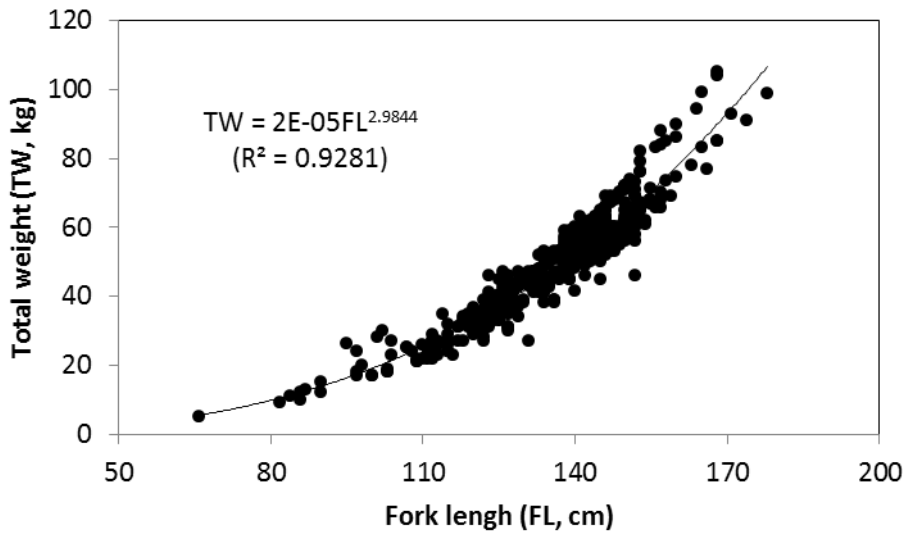


Fig. 2. Relationship between fork length and total weight of SBT collected during 2015-2017.

The von Bertalanffy's growth parameters estimated by a non-linear method were $L_{\infty} = 178.0$ cm, $K = 0.173$ /year, $t_0 = -1.829$ years (Fig. 3).

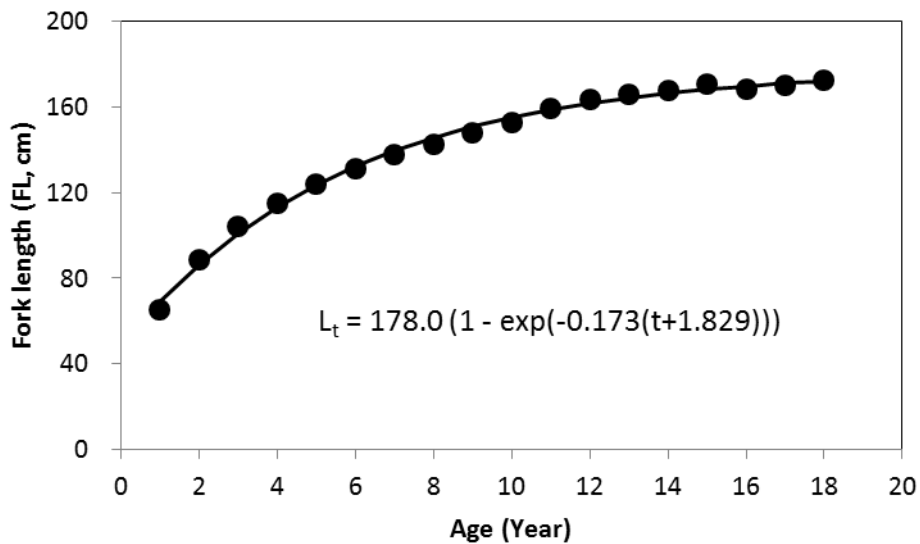


Fig. 3. The von Bertalanffy growth curve of SBT.

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