

Preliminary ageing data of the SBT caught by Taiwanese longliners in 2024

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This document reports on southern bluefin tuna (SBT) otolith sampling activities and direct ageing conducted in 2024. Scientific observers deployed on longline vessels in the Indian Ocean collected otoliths from 21 SBT in 2024, meticulously recording all sampling information. Besides, we collected SBT otoliths from fish landed in Taiwan. We obtained pairs of head sections containing basi-occipital bones from a tuna processing factory in Kaohsiung harbor, Taiwan. These head sections, along with plastic tags clamped to the fish at the time of catch, were sent to the National Taiwan University for otolith extraction and age determination. The ID number on each tag allowed us to access the biological and sampling information for each SBT from the database. Totally, fish ages were determined for 470 SBT collected in 2024 following the ageing manual (Anon 2002) and information from the 2nd CCSBT otolith workshop held in June 26, 2025.

SBT sampled for otoliths were mainly caught in June, July and August during the Taiwanese fishing seasons. A smaller proportion of otolith-sampled SBT were caught in January (3.8%), April (1.5%), May (1.3%) and September (0.6%, Figure 1). The fish were mainly caught in the central Indian Ocean between 30-35 °S and 70-80° E (Figure 2). The fork length of the sampled SBT ranged from 77-162 cm, with fish between 100-116 cm being dominant (Figure 3). Dressed weight ranged from 7-68 kg, with more samples between 10-25 kg (Figure 4). Direct ageing (Figure 5) revealed ages ranging from 2-15 years, with mean ages of 3.4 ± 1.1 year. SBT aged 3+ were the most dominant age class (53%), followed by age 4+ (29.4%) and age 2+ (11.7%). Decimal ages were also calculated according to Eveson et al. (2004), assuming a SBT birthday of January 1st and otolith opaque zone completion in September 30th. Both discrete and decimal age data were fitted to the growth curve (VBGF) and yielded similar growth parameters (Figure 6).

References

- Anon (2002) A manual for age determination of Southern Bluefin Tuna, *Thunnus maccoyii*: Otolith sampling, preparation and interpretation. a product of the direct age estimation workshop of the Commission for the Conservation of Southern Bluefin Tuna, 11 – 14 June 2002, Queenscliff, Victoria, Australia, 36 pp.
- Eveson JP, Laslett GM, Polacheck T (2004) An integrated model for growth incorporating tag–recapture, length–frequency, and direct aging data. Can. J. Fish. Aquat. Sci. 61: 292–306.

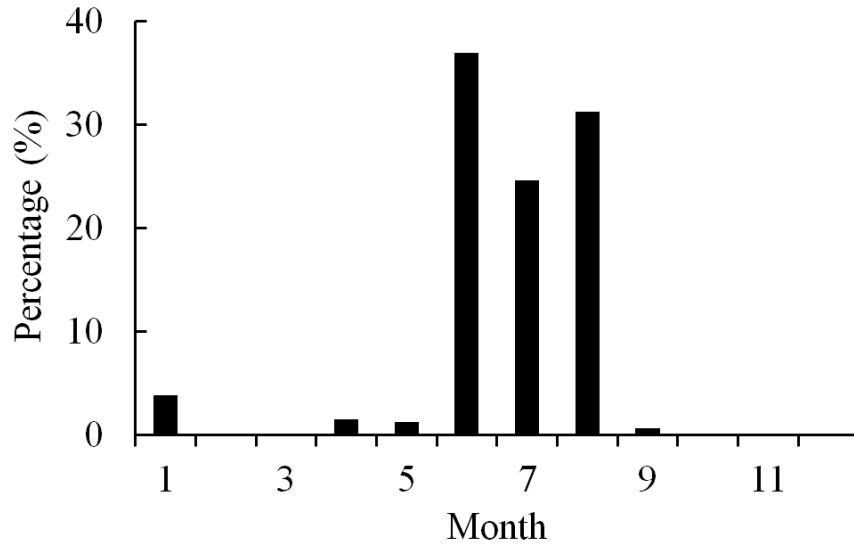


Figure 1. The percentage of the southern bluefin tuna sampled for otoliths. The majority of SBT sampled for otoliths were caught during June, July, and August, with smaller proportions in January, April, May, and September.

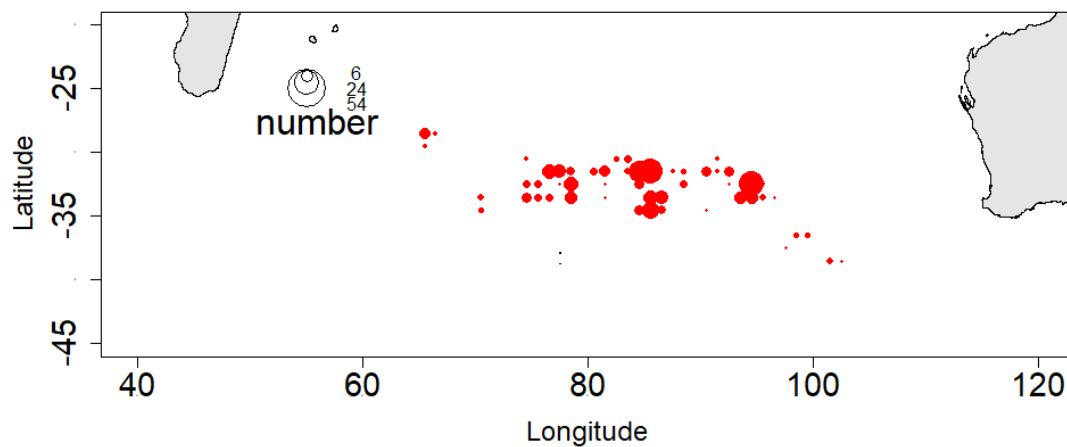


Figure 2. A scatter plot overlaid on a map, showing the spatial distribution of southern bluefin tuna sampled for otoliths. The vast majority of the catch location are clustered in a band in the central Indian Ocean, predominantly located between approximately 30-35°S and 70-95°E. There are some smaller, more scattered points further east and west within this latitudinal band, but the main concentration is quite clear.

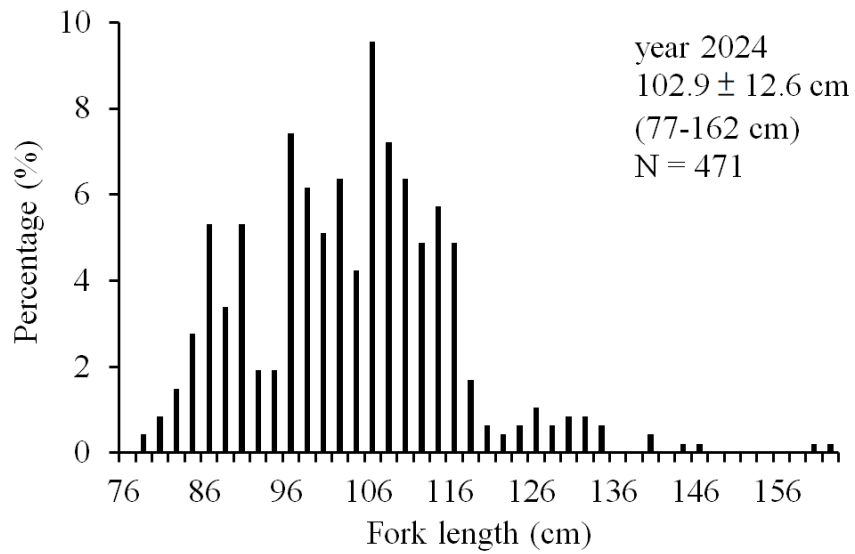


Figure 3. A histogram showing the percentage distribution of southern bluefin tuna fork lengths sampled for otoliths in 2024.

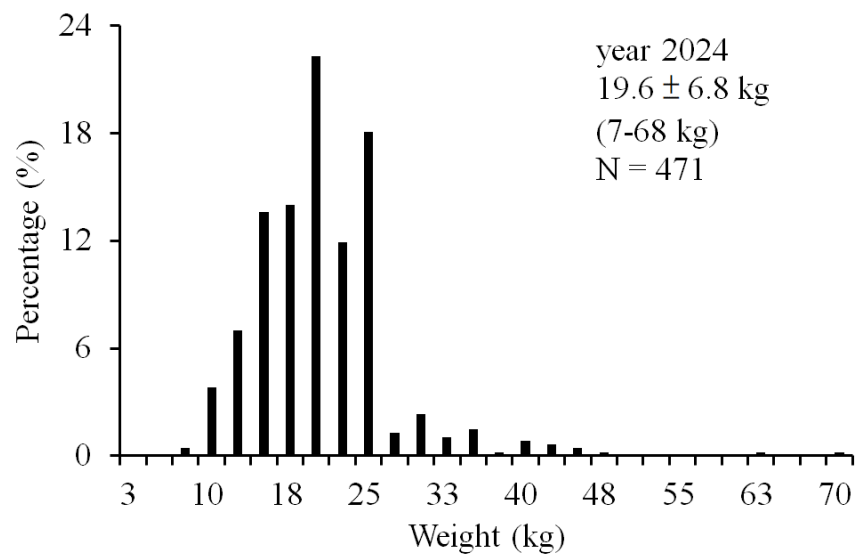


Figure 4. A histogram displaying the percentage distribution of southern bluefin tuna dressed weights sampled for otolith in 2024.

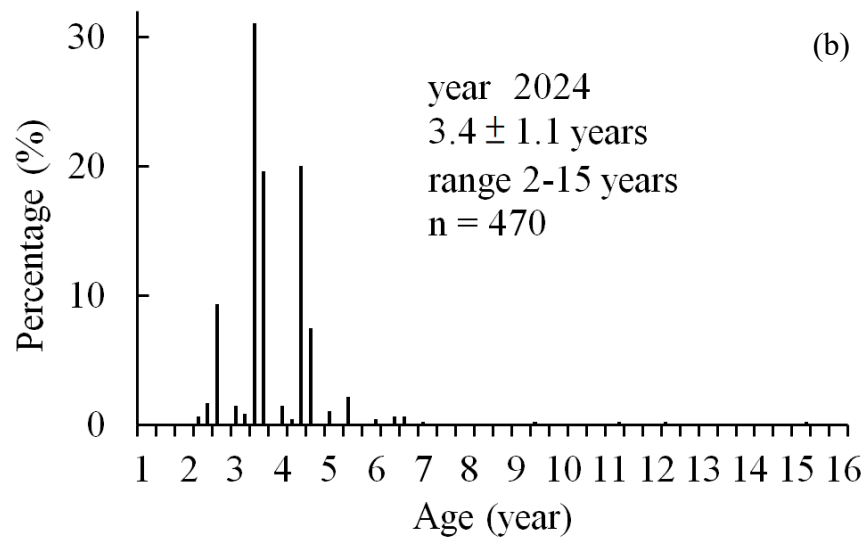
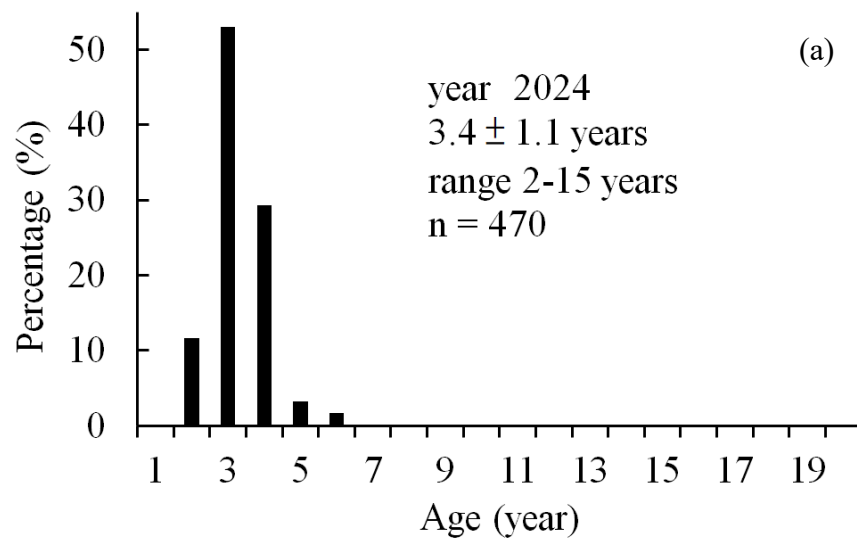


Figure 5. The histogram showing the percentage distribution of southern bluefin tuna ages determined by direct aging in 2024. Panel (a): discrete age, (b) decimal age.

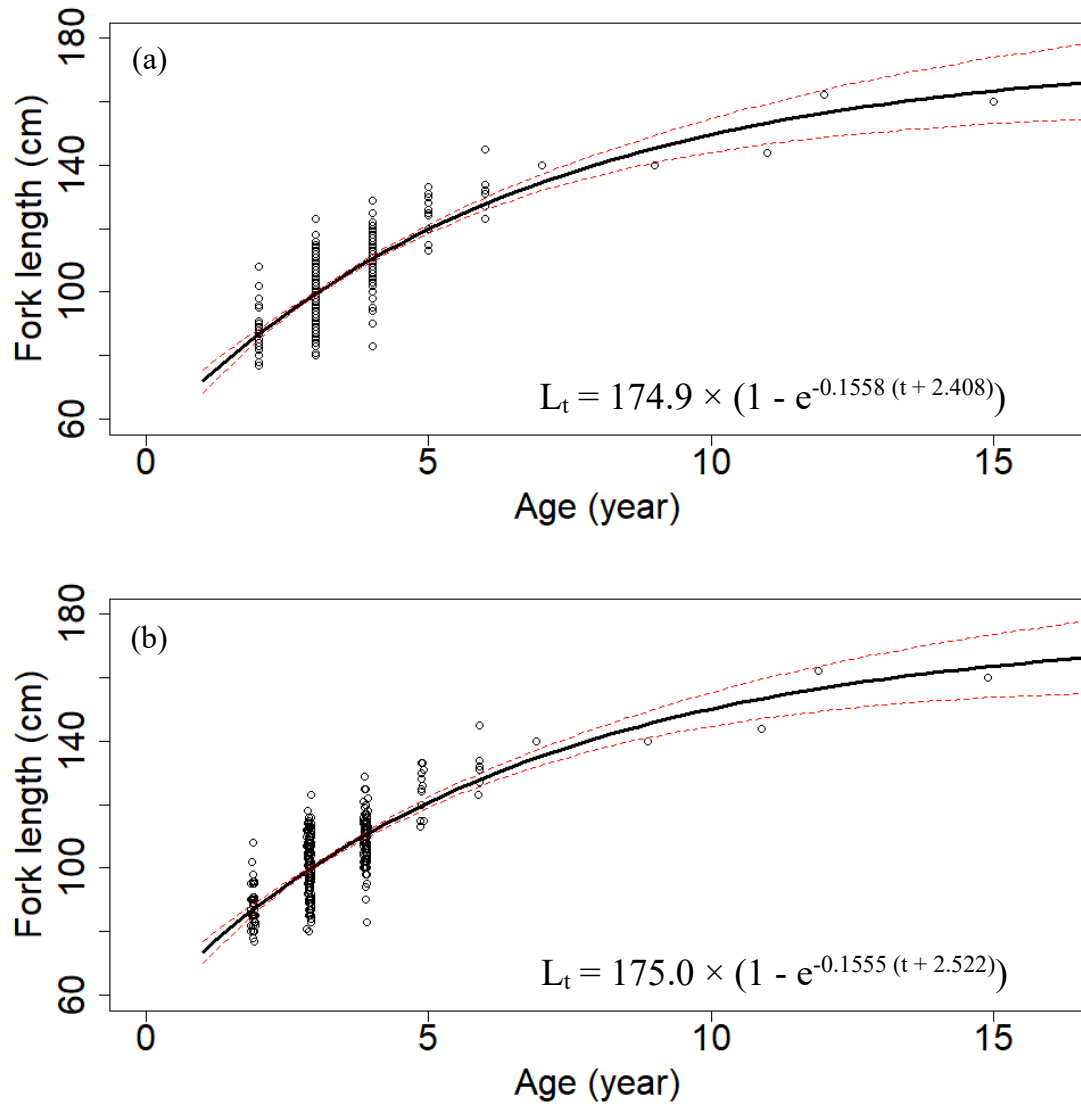


Figure 6. The scatter plots with fitted VBGF growth curves, depicting the relationship between age and fork length for southern bluefin tuna. The red dashed lines represent the confidence intervals around the fitted growth curve. Panel (a): discrete age, (b) decimal age.