

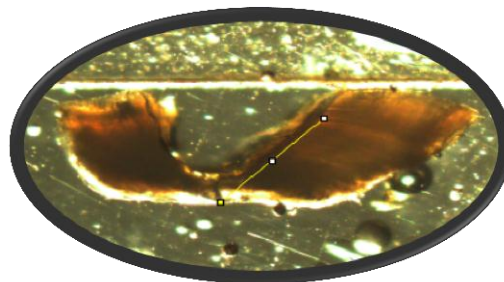
First Annulus Assignment: Atlantic Bluefin Tuna

In aging precision trials, error among readers centers on first annulus assignment along with subsequent 4-5 annuli. Often there appears a “false” annulus proximate to the core region. To reduce this error, Dave Secor’s lab initially used otolith radial measures of sampled yearlings as a surrogate of first annulus formation. In November 2011, Enrique Rodriguez Marin correctly pointed out that yearling otoliths dimensions would exceed the dimension of the first annulus as yearlings were commonly collected during fall months and would be 15-17 months in age. His group measured first annulus dimensions in several Mediterranean sampled yearling otoliths.

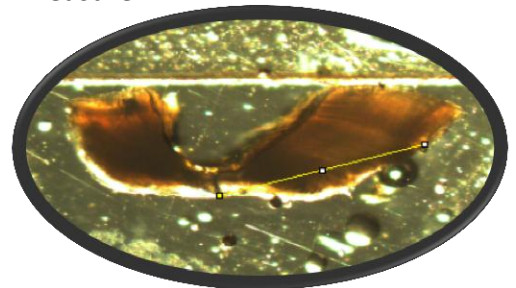
During early 2012, Ben Gahagan (CBL) worked with Dheeraj Busawon (Canada F&O) to come up with consistent ways to measure the first annulus. Two radial measures were explored, both starting just lateral to the core region but ending either on the medial or lateral edge of the first annulus (long ventral arm of the transverse sagittal otoliths section) (Figure 1, note that the measure is the entire vector, not intermediate open circle). Based on measures of yearling otoliths collected from 2002-2004 in US waters and the three otoliths images provided by Enrique (n=22), we estimated mean dimensions of the two annulus measures as 0.86 ± 0.08 and 1.29 ± 0.11 mm and recommend these as benchmarks for first annulus assignment.

	Measure 1	Measure 2
N of Cases	22	22
Minimum	0.73 mm	1.11 mm
Maximum	1.00 mm	1.49 mm
Arithmetic Mean	0.86 mm	1.29 mm
Standard Deviation	0.08 mm	0.11 mm
Coefficient of Variation	0.10	0.08

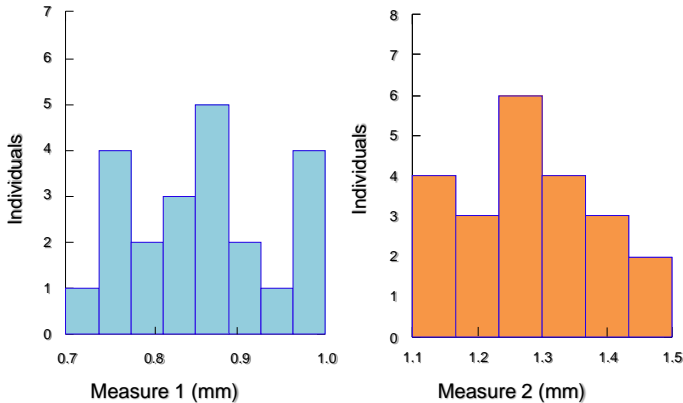
Measure 1



Measure 2



Transverse Section Otolith First Annulus Measures



Transverse Section Otolith First Annulus Measures

