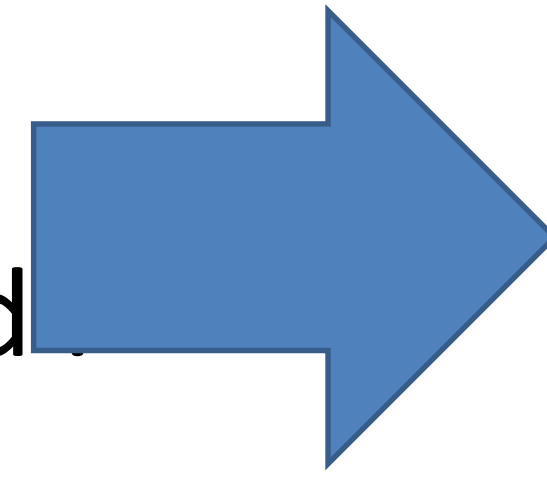


# The Relationship between Age and Growth of Japanese Whiting (Japanese Fish) Sonetaka Mikihiro

## Introduction

Japanese whiting is a popular fish in Japan. However, big ones are rare, and cannot be easily found.



How long does it take for Japanese whiting to grow ?

## What is Japanese whiting ?

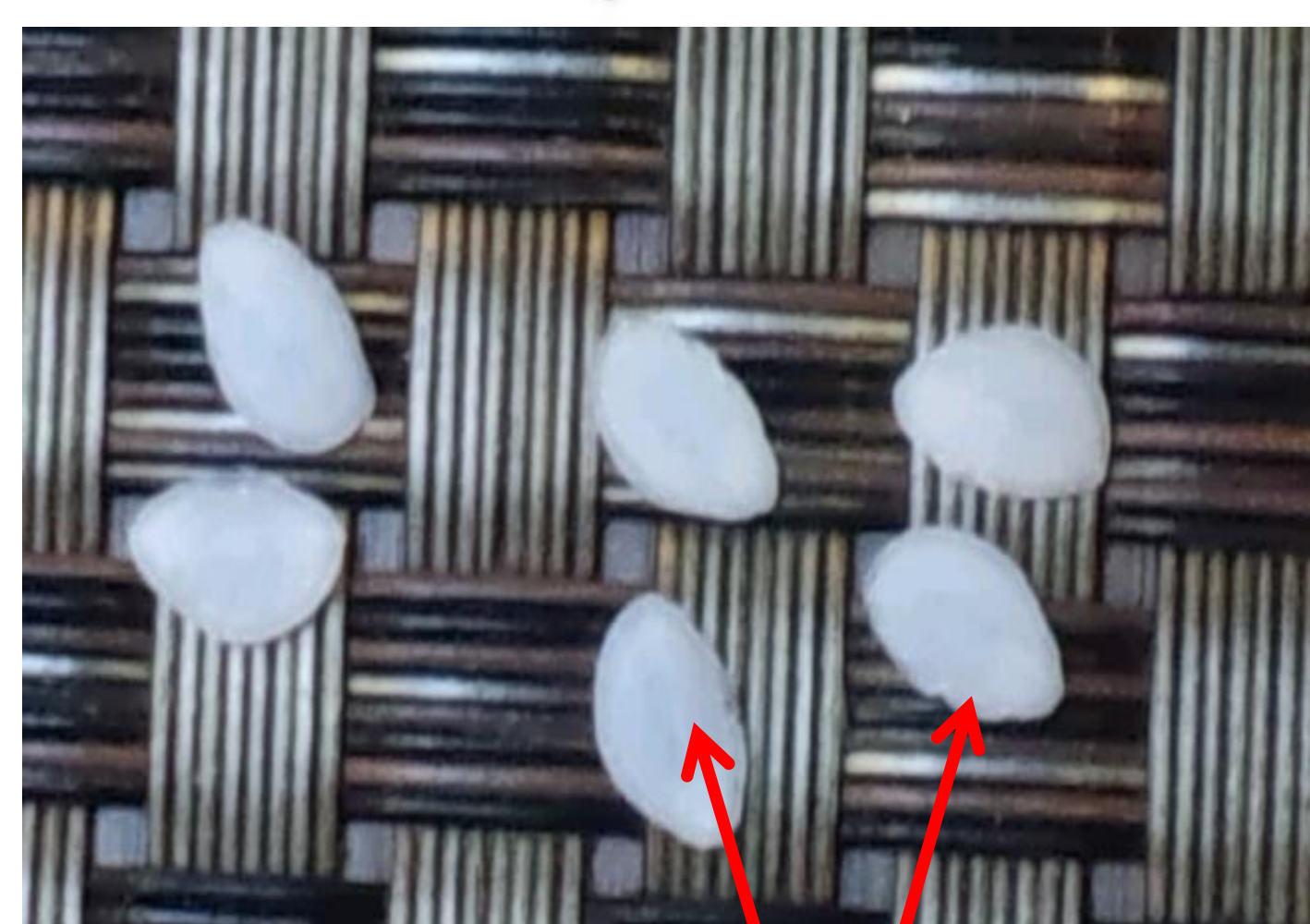
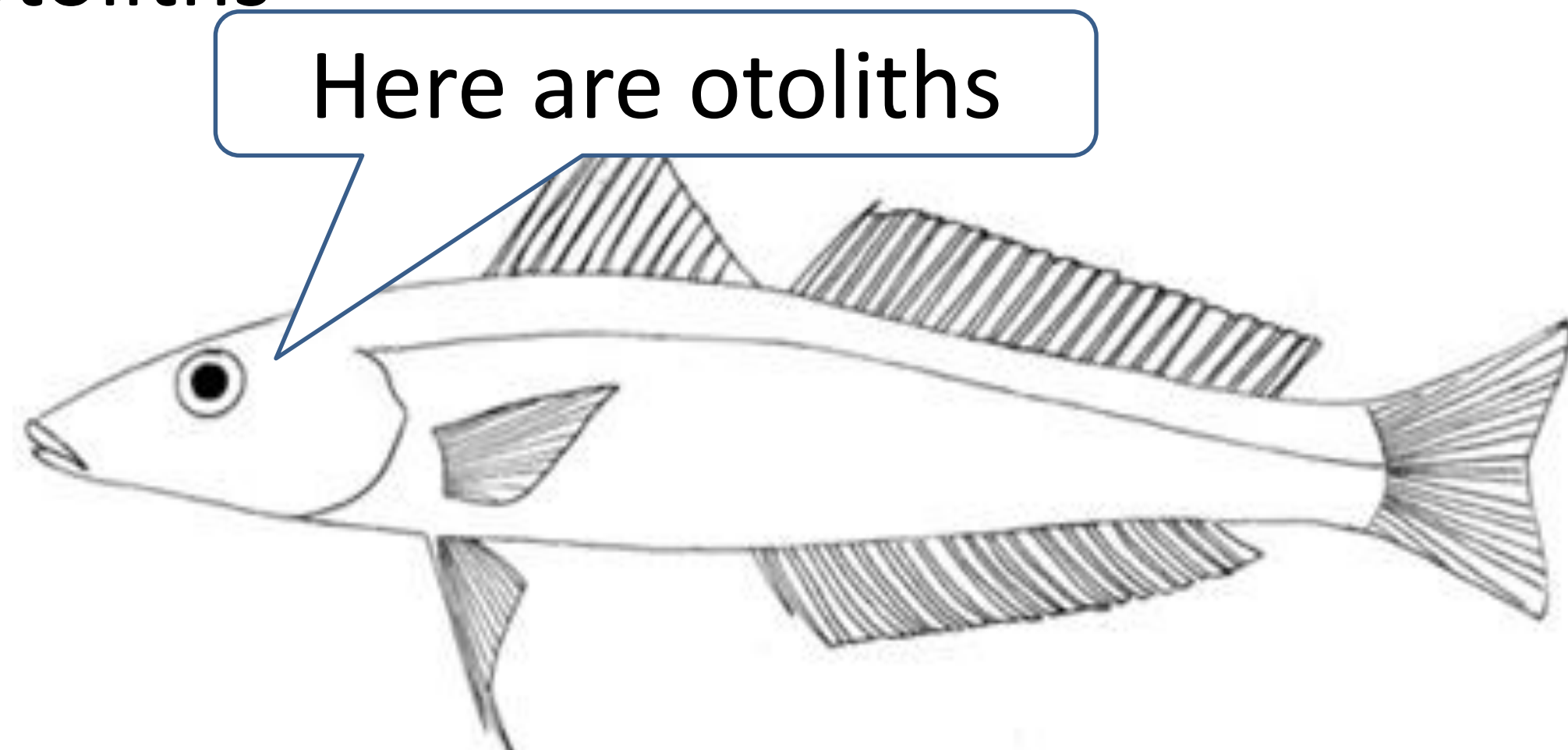
Japanese whiting is a fish found in Japan. Japanese whiting grows up to 30cm. (1cm=0.39inches) I think Japanese whiting is delicious. Japanese whiting is used for tempura, sashimi, and so on.



Japanese whiting (big one)

## Theory

This fish has two otoliths in its head. The otolith is the sense organ for equilibrium. Otoliths grow with fish, and one line is inscribed every winter, so the age of the fish can be known from its otoliths.



5mm  
pulled out otoliths



line on the otolith

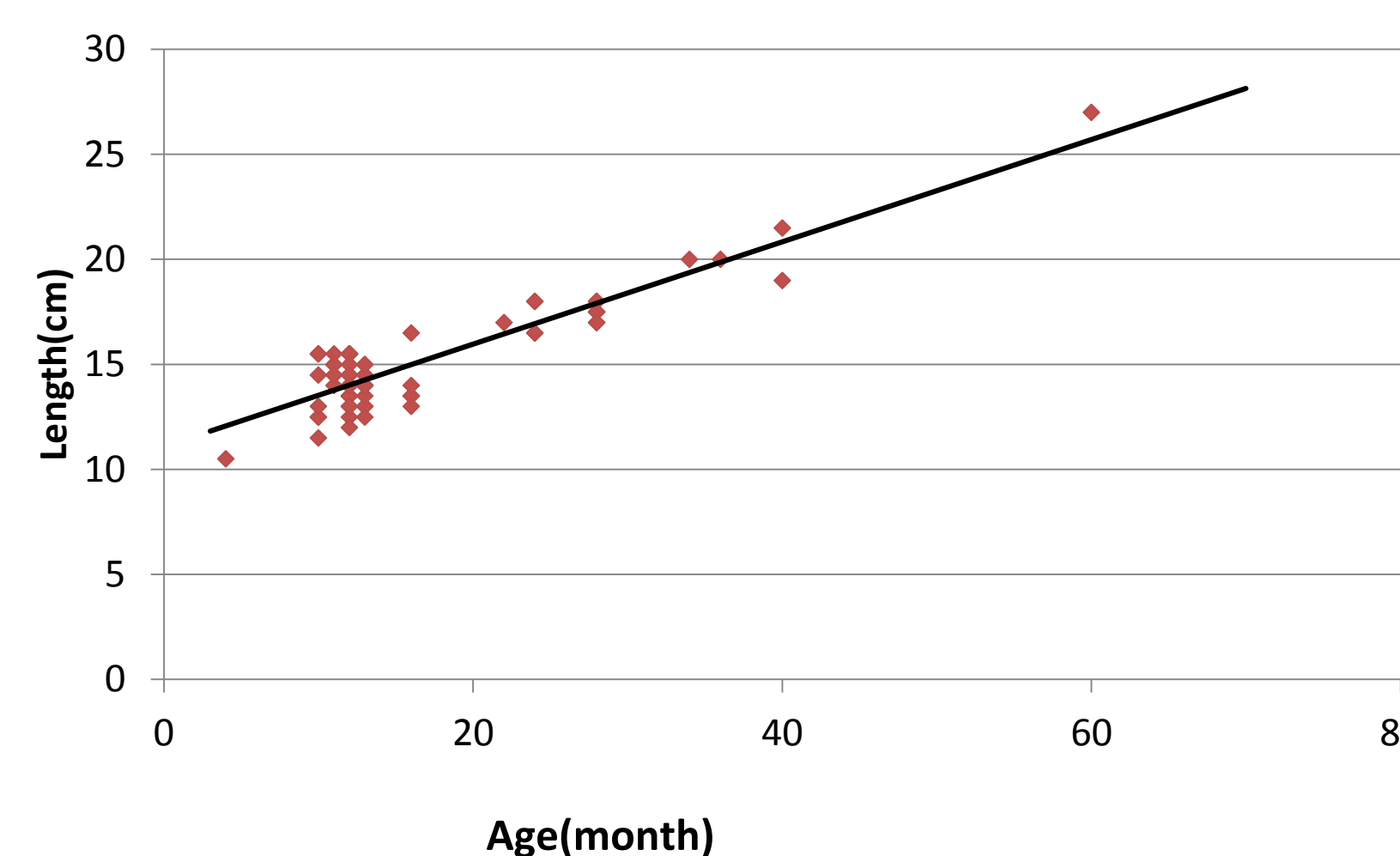
## Method

Measure weight and length of 76 "Japanese whittings", and investigate their age from their otoliths. Make a graph of the relationship between their age and growth.

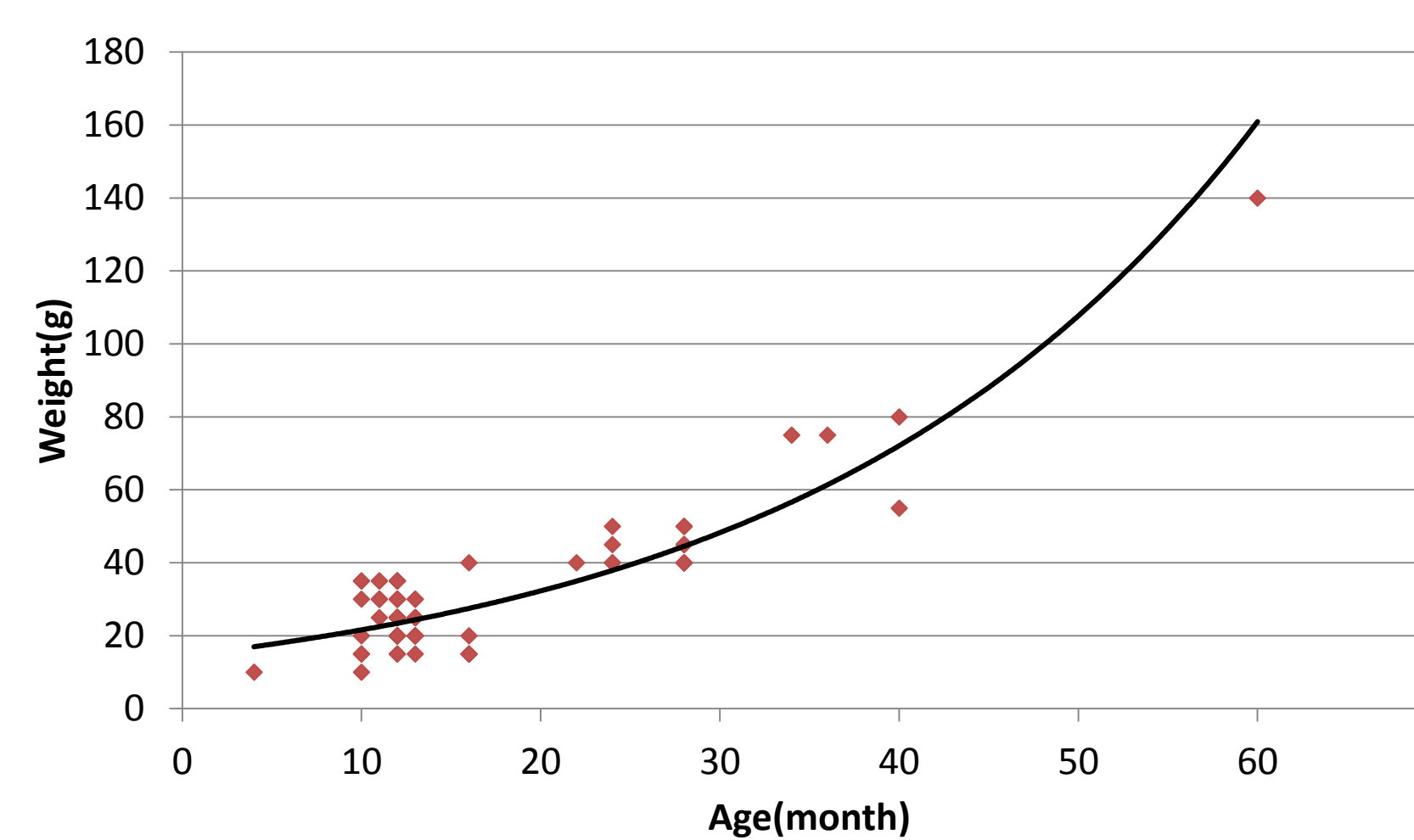
## Result

Year	Date	Age(month)	Weight(g)	Length(cm)
2011	6/8	22	40	17
2011	6/8	10	10	11.5
2011	6/8	10	15	12.5
2011	6/8	10	35	15.5
2011	6/8	34	75	20
2011	6/8	10	15	12.5
2011	6/8	10	30	14.5
2011	6/8	10	20	13
2011	7/26	11	30	15
2011	7/26	11	25	14
2011	7/26	10	35	15.5
2011	7/26	11	30	14.5
2011	7/26	11	35	15
2011	7/26	11	30	14.5
2011	7/26	11	35	15.5
2011	8/17	24	45	18
2011	8/17	12	25	14
2011	8/17	36	75	20
2011	8/17	12	35	15.5

A part of the data (20 out of 76 fish)



Relationship between age and length

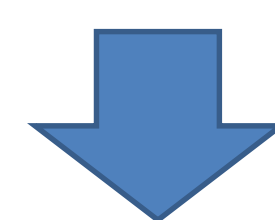


Relationship between age and weight

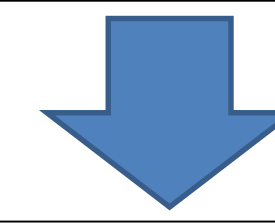
## Conclusion

The graph of age and length is linear. The relationship between age and weight shows an upward curve.

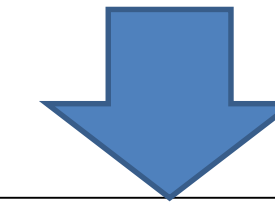
1 year old → 14 cm; 24 g (avg)



2 years old → 17.5 cm; 43.5 g (avg)



3 years old → 20 cm; 70 g (avg)



5 years old → 27 cm; 140 g (avg)

## References

Wikipedia 耳石 (otolith)  
<http://ja.wikipedia.org/wiki/%E8%80%B3%E7%9F%B3>  
 魚の耳石 (fish's otolith)  
<http://www.fklab.fukui.fukui.jp/ss/jiseki/onojisekinituite.html>