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Length-weight relationship in witch (Glyptocephalus cynoglossus)
in the Newfoundland area of the Northwest Atlantic

by

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Introduction

During recent years, witch (Glyptocephalus cynoglossus) has become an important commercial species in the Northwest Atlantic, particularly in Subareas 2 and 3, with removals reaching fairly substantial proportions. In 1973, witch landings reached 35,000 tons for Subareas 2 and 3. International catch quotas were imposed in 1973 and all stocks are now under international regulation. An important parameter for stock assessment is the relationship between length and weight and this paper presents a documentation of this parameter.

Since witch are always landed whole, it was not necessary to compute equations for length-gutted weight relationships or to establish conversion factors for gutted to whole weight and vice-versa. One equation for length versus whole weight was deemed sufficient.

Materials and Methods

The length-weight equation was computed using 3325 witch lengths and weights from catches of research vessels taken throughout the Newfoundland area of the Northwest Atlantic. All the fish were measured to the nearest centimetre from the tip of the snout to the end of the longest caudal fin ray. The lengths ranged from 9 cms to 70 cms. The frequency distribution is presented in Figure 1. Weights were taken in grams to the nearest gram.

The length-weight curve was obtained by the equation $W = cL^b$ in which W = weight, L = length and c and b are constants. The least squares regression of the logarithmic transformation

$$Y = c + bX$$

was used where $Y = \text{Log}_{10}W$; and $X = \text{Log}_{10}L$.

Results

The calculated equation derived from the logarithmic transformation for length versus whole weight is

$$W = 0.00063709L^{3.6142}$$

and the length-weight curve is presented in Figure 2.

To estimate the weight of any fish of known length, this equation would be a quite reasonable approximation.

References

- Lear, W. H. 1968. Length-weight relationship of commercial size Greenland halibut, Reinhardtius hippoglossoides (Walbaum). Intern. Comm. Northw. Atlant. Fish. Res. Bull. No. 6, 1969.
- Snedecor, George W. 1956. Statistical methods, 5th ed. Iowa State University Press, Ames, Iowa, 534 p.

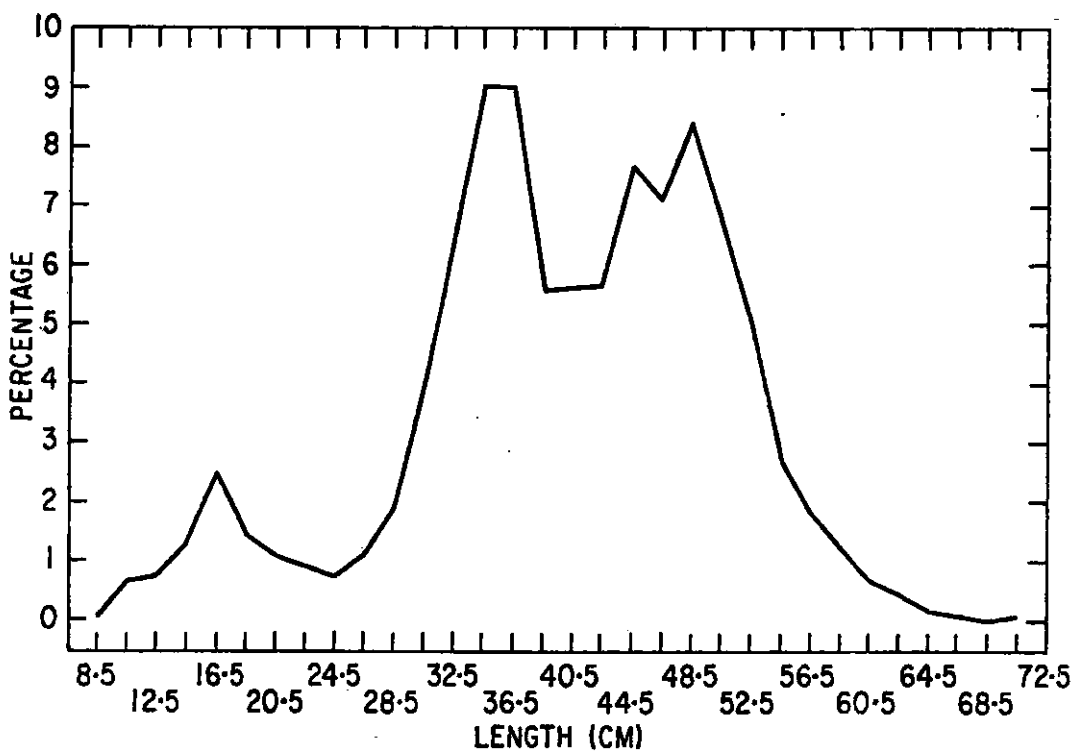


Fig. 1. Length distribution of witch (3325 fish) used in computing length-weight curves.

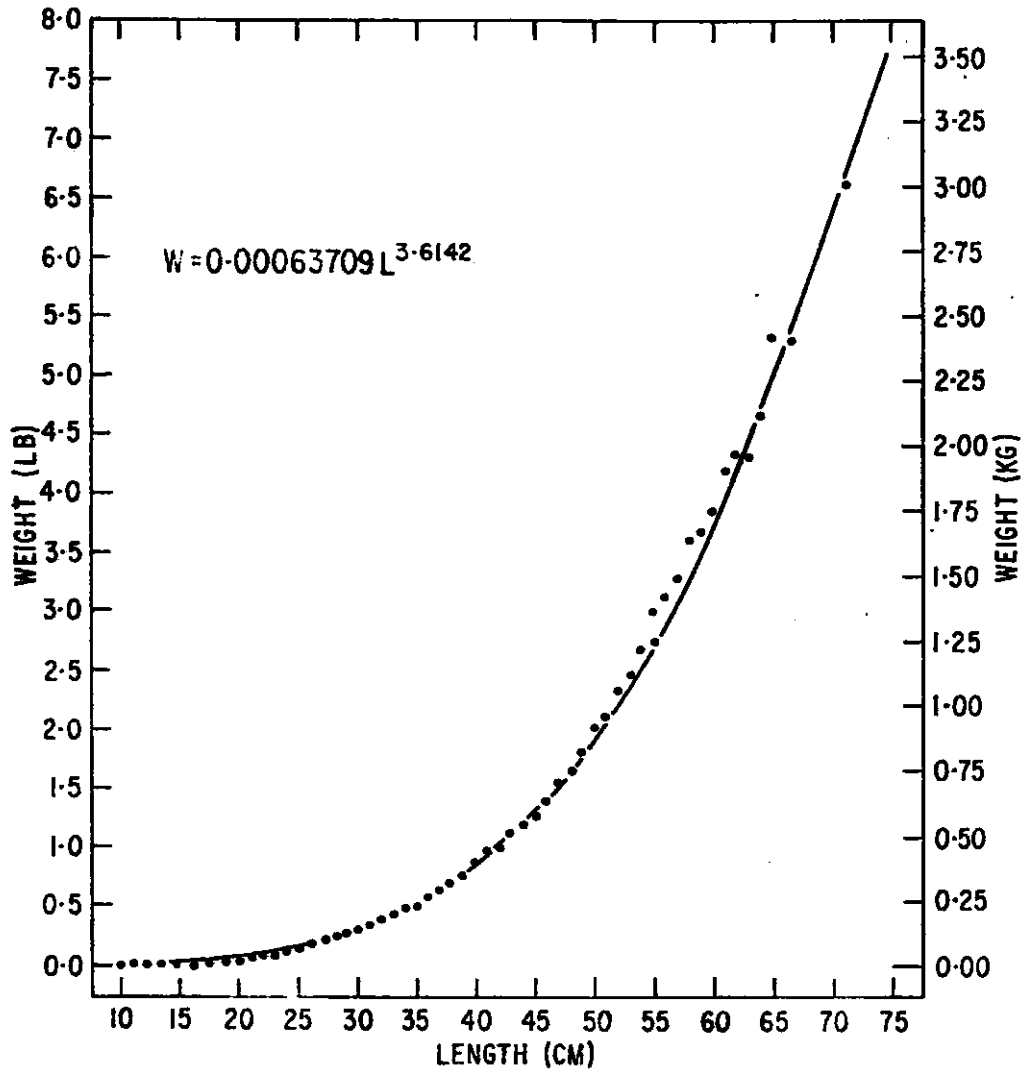


Fig. 2. Length-whole weight curve of witch.