Morphometric Relationships in Wahoo, *Acanthocybium solanderi*, Landed in St. Lucia

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ABSTRACT

The wahoo, *Acanthocybium solanderi*, represented approximately 14% of the estimated total fish landed in St. Lucia during 1988 having been landed at most of the fish landing sites around that island. Some morphometric relationships based on catches sampled at the St. Lucia Fish Marketing Corporation Limited, during 1987-1988, are presented. The regression of fork length (FL) on total length (TL) is given by the equation FL = 1.086 + 0.950 TL. The relationship between gutted weight (GW) and total length is given by the equation $GW = 1.039 \times 10^{-6} TL^{3.206}$, while that between gutted weight and fork length is given by the equation $GW = 2.991 \times 10^{-6} FL^{3.072}$.

KEY WORDS: growth, morphometric, St. Lucia, wahoo

INTRODUCTION

Within any stanza of a fish's life, weight (w) varies as some power of length (L) such that:

$$W = aL^{b}$$

The value of b is usually determined by plotting the logarithm of weight against the logarithm of length for a large number of fish of various sizes, the slope of the fitted line being an estimate of b (Ricker, 1975). The functional regression value b = 3 describes isometric growth, such as would occur in a fish having an unchanging body form or specific gravity. Many species seem toapproach this "ideal" (*ibid.*) while others have b-values greater or less than three, a condition known as allometric growth. In these cases, there are sometimes significant differences between differrent populations of the same species, or between the same population in different years (Ricker, 1975).

The wahoo, *Acanthocybium solanderi*, is a target of the pelagic fishery of the islands of the eastern Caribbean. In most of these islands the pelagic fishery is one of the fastest growing (Hunte,1985). While Mahon *et al.*. (1990) have stated that the pelagic season can be considered to extend from September to the following August, Murray (1989) has pointed out that in St. Lucia, the season can be considered to extend from mid-November to the end of the following July.

Wahoo, which represented approximately 14% of the total estimated fish landed in St. Lucia during 1988 (Murray and Nichols, 1990), are landed at most

of the fish landing sites around St. Lucia (Murray, 1989). In most instances, the fish caught at the major landing sites are sold in quantity to the St. Lucia Fish Marketing Corporation Limited (FMC). The viscera are removed from the fish prior to sale to the FMC. It is these "gutted" fish that were used for this study; the data being collected at the FMC.

METHODS

Fork and total lengths were measured to the nearest millimeter, with a perspex measuring board graduated in millimeters. The fish were weighed in pounds, on a commercial platform scale with analog readout, and weights were converted to grams. Regression analyses for the determination of morphometric relationships were done with the computer programme MSTAT (Nissen *et al.*, 1987).

RESULTS

Figure 1 shows the regression of fork length (FL) on total length (TL) given by the equation:

$$FL = 1.086 + 0.950\ TL;\ r^2 = 0.997;\ n = 75$$

The regression of the natural logarithm of gutted weight (ln GW) on the natural logarithm of total length is given by the equation:

$$\ln GW = -13.778 + 3.206\ \ln TL;\ r^2 = 0.992;\ n = 195$$

such that the regression coefficient is significantly different from three ($t = 3.375$; $t_{0.005,(2),190} = 2.840$).

Figure 2 shows the relationship between gutted weight and total length expressed by the equation:

$$GW = 1.039 \times 10^{-6}\ TL^{3.206}$$

The regression of natural logarithm of gutted weight on the natural logarithm of fork length is given by:

$$\ln GW = -12.720 + 3.072\ \ln FL;\ r = 0.986;\ n = 36,$$

with the regression coefficient not being significantly different from three ($t = 0.801$; $t_{0.05,(2),34} = 2.032$).

Figure 3 shows the relationship between gutted weight and fork length as expressed by the equation:

$$GW = 2.991 \times 10^{-6}\ FL^{3.072}.$$

CONCLUSION

In considering the derived morphometric relationships, it is to be remembered that such relationships are only valid over the range of fish sizes measured (Royce, 1972; Ricker, 1975). That the exponent of the gutted weight versus total length relationship is significantly different from three should not be taken categorically to mean that this species does not exhibit isometric growth since the number of fish sampled may be considered by some to be relatively

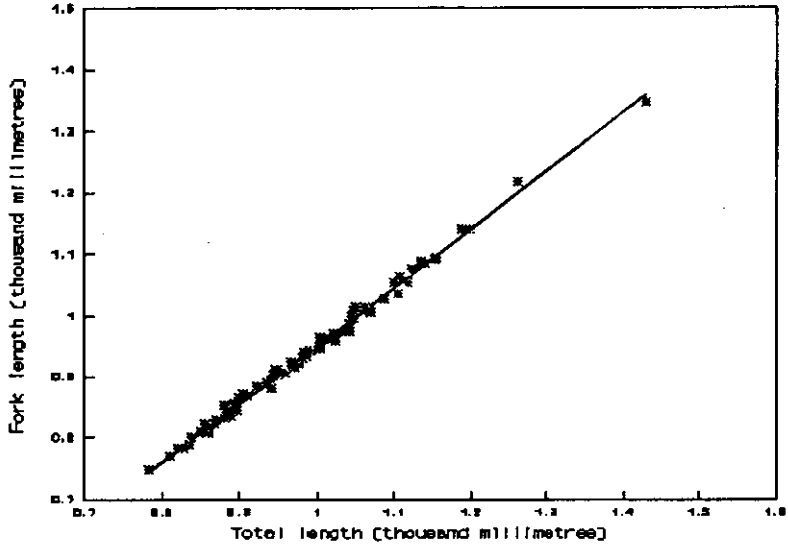

Figure 1. Fork length vs total length for *A. solandri* landed in St. Lucia in 1987 / 88.

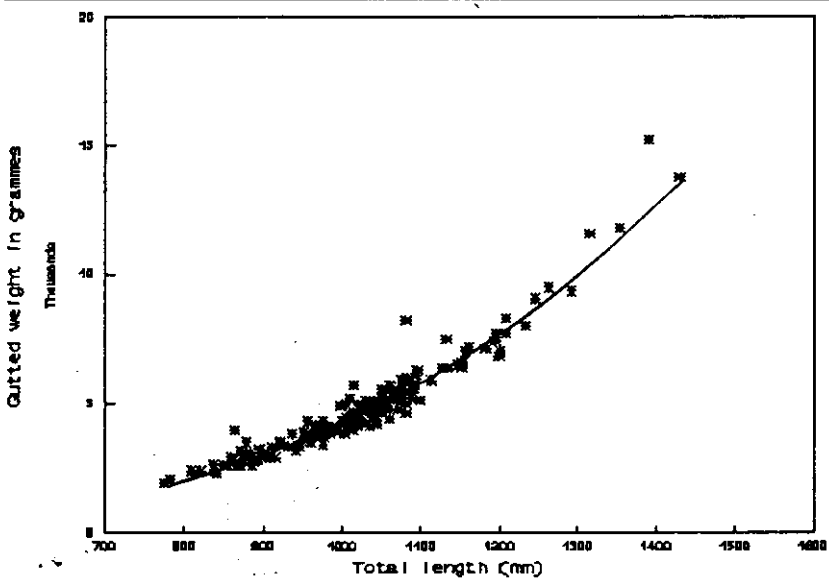

Figure 2. Gutted weight vs total length for *A. solandri* landed in St. Lucia in 1987 / 88.

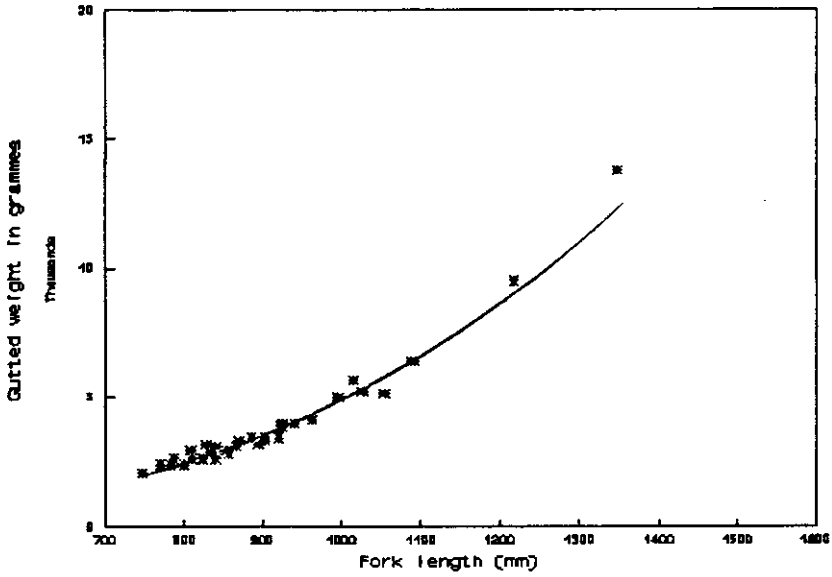

Figure 3. Gutted weight vs Fork length *A. solandri* landed in St. Lucia in 1987 / 88.

small. It could be surmised that if a still larger sample (with more fish at the extremes of length) was used, a more representative relationship would have been derived.

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