Some Morphometric Relationships in *Etelis oculatus* Valenciennes (Queen Snapper), Landed in St. Lucia, W.I.

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ABSTRACT

Some morphometric relationships of the queen snapper, *Etelis oculatus* Valenciennes, caught off the south of St. Lucia during the months of August to November 1987 are presented.

Weight is related to total length by the equation:

$$Tw = 4.894 * 10^{-5}Tl^{2.722}$$

and to fork length by the equation

$$Tw = 6.315*10^{-5}Fl^{2.771}$$

Condition factor is calculated as 0.806 where the length is total length. Fulton's condition factor (length = fork length) was found to be 1.490. Fork length is related to total length by the equation:

$$Fl = -9.855 + 1.159 \, Tl$$

weight being measured in kilogrammes and length in centimetres, and converted to grammes and millimeters for the calculations.

These results could serve as a starting point for other studies on this species in the O.E.C.S. sub-region with potential for use in stock identification.

INTRODUCTION

Landings of the Lutjanid *Etelis oculatus* Valenciennes (queen snapper), make up some 60%-70% of demersal landings in the south of St. Lucia during the "low" fishing season which stretches from July to mid-December (F.M.U., unpublished data). Fishing for snapper usually begins around August 15th. of each year and continues until the migratory pelagics begin to "run" in mid to late November. To a large extent, the majority of queen snapper landings on St. Lucia are made in Vieux Fort to the extreme south of the island, it being closest to the major fishing banks. These banks are situated to the southeast of Vieux Fort.

It has been implied (Pitcher and Hart, 1982) that a given set of morphometric characteristics could be expected to be indicative of a given stock of the species. Ricker (1975) has stated for example, that the functional

regression value b in the length-weight relationship may vary between different populations of the same species, or between the same population in different years.

The length-weight relationship has practical applications: market sampling of commercially important fish may often only measure either length or weight. Where necessary, an estimate of the other characteristic can be obtained by using a predetermined length-weight regression. Ecologically the length-weight regression coefficient is used often as a measure of fish condition (Ricker, 1975; Pitcher and Hart, 1982). A cyclical change in condition occurs during the year, with the fish becoming relatively heavier as the gonads grow, so that the length-weight regression coefficient increases towards the value of 3. It has been traditionally assumed that this coefficient is 3 at all times and that condition is hence defined as:

$$cf = \frac{W}{L^b}$$

b being the regression coefficient of the linearized length-weight relationship and having the value 3, and describing isometric growth as would characterize a fish having "an unchanging body form and unchanging specific gravity" (Ricker, 1975). Some species, on the other hand, have b-values characteristically different from 3, a condition called allometric growth (Ricker, 1975) Cinco (1982) suggests the preferential use of condition factor over b especially when the latter: (a) is not based on a large number of fish (b) does not cover a wide range of sizes. The condition factor is suitable for indicating differences related to season or place of capture (Ricker, 1975; Gulland, 1983), and can be used to compare fish of approximately the same length.

METHODS

Data were collected at Vieux Fort by sampling queen snapper landings from local fishing vessels between August and November of 1987. Landing took place between 16:00 and 19:00 hours, the boats having left shore between 05:00 and 06:30 hours.

The diagnostic features cited by Allen (1985) were used to identify the fish. Total (Allen, 1985) and fork (Smitt or median; Ricker, 1975) lengths were measured, in centimeters with a perspex measuring board for 394 fish. Total weight was measured in kilogrammes on a Soehnle, 10 kg x 50 g, kitchen balance for 62 fish. Weights and lengths were converted to grammes and millimeters respectively.

Regression analyses were done with the computer programme MSTAT.

Mean condition factor was calculated by adapting the method of Cinco (1982) such that a multiplication factor of 10^5 was used to ensure values of

condition factor between 0.5 and 1.5 for fishes with "normal" shapes and using the equation:

$$\overline{c.f.} = \frac{\Sigma (TW * 10^5/TL^3)}{n}$$

Mean Fultons condition factor, $\overline{f.c.f.}$ (Ricker, 1975), was calculated using the above equation with fork length substituted for total length.

RESULTS AND CONCLUSIONS

Figure 1 shows the relationship between (a) natural logarithm of total length and natural logarithm of weight; (b) total length and weight, given by the following equations:

ln Tw = –9.925 + 2.722 ln Tl (r = 0.980; n = 62)	1(a)
Tw = 4.894 * 10^{-5} Tl $^{2.722}$	1(b)

Figure 2 shows the relationship between a) natural logarithm of fork length and natural logarithm of weight; b) fork length and weight, given by the equations:

ln Tw = –9.670 + 2.771 ln Fl (r = 0.985; n = 62)	2(a)
Tw = 6.315 * 10^{-5} Fl $^{2.771}$	2(b)

The relationship between total length and fork length is given by the equation:

Fl = –9.855 + 1.159 Tl (r = 0.964; n = 394)	3

Mean condition factor was calculated as being 0.806.

Mean Fultons condition factor was found to be 1.490.

The results presented here could serve as a starting point for the study of other stocks of *E. oculatus* in the O.E.C.S. sub-region. Further, if these other stocks have significantly different morphometric relationships from those presented herein, it is conceivable that these relationship could be used for stock identification.
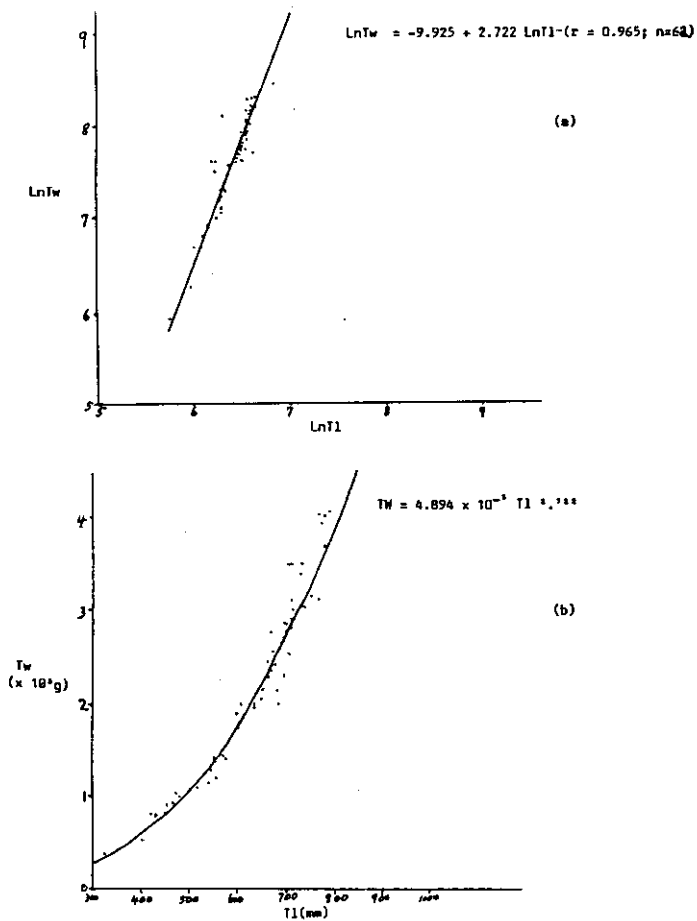
ACKNOWLEDGEMENTS

Figure 1. Graph of (a) natural log of total weight vs natural log of total length (b) total weight vs total length for *Etellis oculatus* Val. Landed in St. Lucia in 1987.
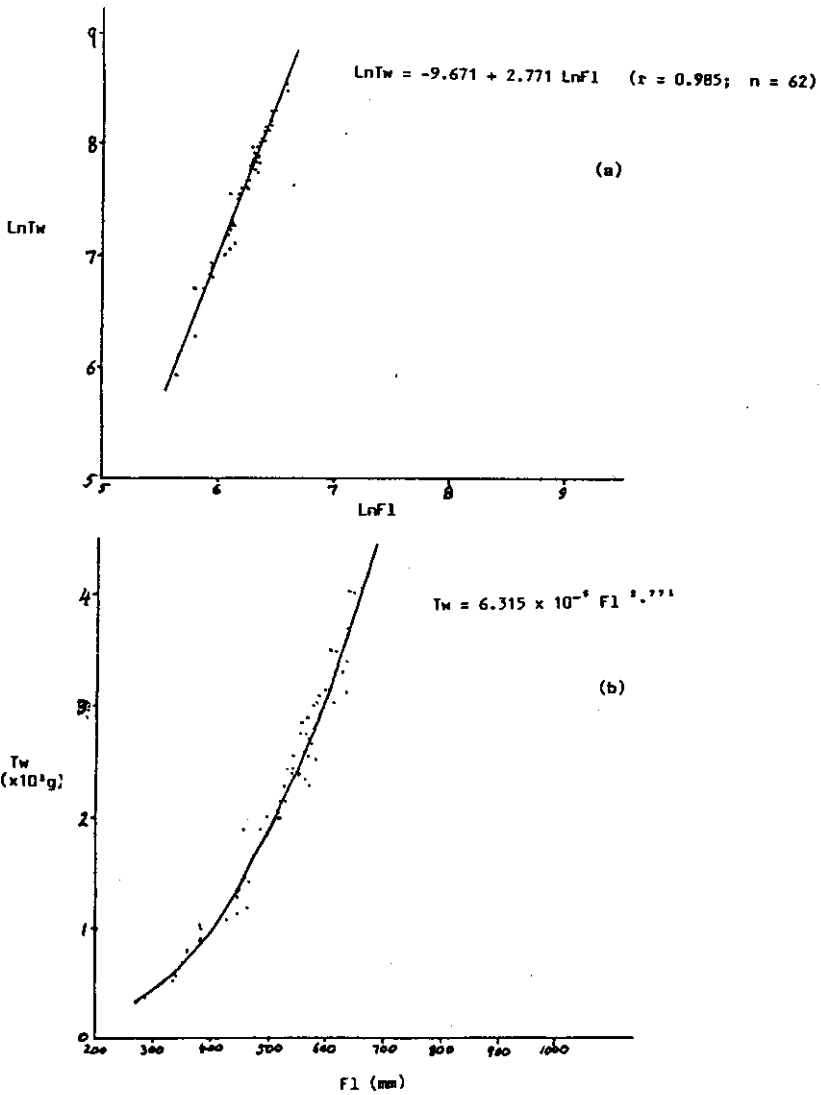
Figure 2. Graph of (a) natural log of total weight vs natural log of fork length
(b) total weight vs fork length for *Etelis oculatus* Val. landed in St. Lucia in 1987.

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