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# Tabular Data on Marine Fishes from Southern Africa, Part II: Growth Parameters*

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## Abstract

This contribution presents von Bertalanffy growth parameter estimates for 28 species of marine fishes derived from growth curves in R. van der Elst's "Guide to the Common Sea Fishes of Southern Africa".


## Introduction

This contribution is a follow-up to Torres (1991), who presented the parameters a and b of length-weight relationships in 122 species of marine fishes from southern Africa, estimated from graphs published in van der Elst (1981).

Here we present growth parameters estimated from 29 growth curves also presented in van der Elst (1981). Our aim is to document, for subsequent entry into FISHBASE (Froese 1990 and Pauly and Froese 1991), important parameters of fishes from a part of the world with major fish and fisheries resources.

## Materials and Methods

Length-at-age date pairs were read off from the growth curves of van der Elst (1981) at regular intervals for all fish with such curves except the elasmobranchs (sharks and rays).

These data pairs were then fitted with the von Bertalanffy growth function (VBGF) using the method of Gaschütz et al. (1980), which estimates parameters $L_\infty$, K and $t_0$ from a linearized form of the VBGF.

No attempt was made to estimate standard errors as the growth curves in van der Elst (1981) were drawn from growth parameters, i.e., did not indicate any variability of growth [note that van der Elst 1981 did not indicate the sources of his growth curves, of which several probably pertain to stocks from outside southern Africa]. The growth curve for elasmobranchs were not analyzed, as they are based on a method suggested by Holden (1974), now known to produce very erroneous results (Pauly 1978; Pratt and Casey 1990).

## Results and Discussion

Table 1 presents our key results, i.e., estimates of $L_\infty$, K and $t_0$ ; the computed values of $\phi'$ (= log K + $2\log_{10}L_\infty$) can be used to compare the growth performance of the species and/or populations reported upon here with those for other populations and/or other species, from other areas (Pauly and Munro 1984). Readers interested in constructing curves expressing growth in weight may consult Torres (1991) for the parameters a and b of length-weight relationships for the 28 species in Table 1 (+ 94 others).

We conclude this analysis of graphs published by van der Elst (1981) by lauding his book, in which fish are not only presented in taxonomic terms - with photos - but also in terms of their biology and ecology, with distribution maps and the extremely useful curves analyzed here, and in Torres (1991). We hope that the FISHBASE project alluded to above and in Palomares et al. (this issue) will contribute to more such books being written and published, for other regions of the world.

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Table. 1. Growth of related parameters in 28 species of marine fishes from southern Africa.

| Family | Species | Length[a] type | $L_{max}$ (cm) | $L_\infty$ (cm) | K ($year^{-1}$) | $t_0$ (year) | $\phi'$ |
|---|---|---|---|---|---|---|---|
| Albulidae | *Albula vulpes* | F | 100 | 101.5 | 0.301 | -0.731 | 3.49 |
| Carangidae | *Trachurus capensis* | F | 70 | 55.6 | 0.122 | -0.370 | 2.58 |
| Clupeidae | *Sardinops ocellata* | T | 30 | 30.4 | 0.231 | -1.419 | 2.33 |
| Coryphaenidae | *Coryphaena hippurus* | F | 180 | 156.1 | 1.036 | -0.456 | 4.40 |
| Ephippidae | *Drepane punctata* | T | 45 | 42.4 | 0.219 | 0.080 | 2.60 |
| Istiophoridae | *Makaira nigricans* ♂ [b] | F | 400[c] | 362.7 | 0.324 | 0.079 | 4.63 |
| Istiophoridae | *Tetrapturus audax* ♂ | F | 320[c] | 252.1 | 0.748 | -0.093 | 4.68 |
| Istiophoridae | *Tetrapturus audax* ♀ | F | 320[c] | 319.9 | 0.610 | 0.241 | 4.79 |
| Merlucciidae | *Merluccius capensis* | T | 110 | 117.3 | 0.131 | -0.517 | 3.26 |
| Ophidiidae | *Xiphiurus capensis* | T | 150 | 150.6 | 0.112 | -0.716 | 3.40 |
| Pomadasyidae | *Pomadasys commersonni* | T | 80 | 91.7 | 0.191 | -0.178 | 3.21 |
| Pomatomidae | *Pomatomus saltator* | T | 100 | 93.6 | 0.188 | -0.178 | 3.22 |
| Rachycentridae | *Rachycentron canadum* | F | 200 | 141.0 | 0.201 | 0.652 | 3.60 |
| Sciaenidae | *Argyrosomus hololepidotus* | T | 200 | 172.7 | 0.156 | -0.002 | 3.67 |
| Scombridae | *Euthynnus affinis* | F | 100 | 82.0 | 0.508 | 1.020 | 3.53 |
| Scombridae | *Rastrelliger kanagurta* | T | 35 | 30.3 | 0.724 | -0.198 | 2.82 |
| Scombridae | *Scomber japonicus* | F | 70 | 73.8 | 0.213 | 0.911 | 3.06 |
| Scombridae | *Thunnus alalunga* | F | 140 | 140.7 | 0.146 | 1.251 | 3.46 |
| Scombridae | *Thunnus albacares* | F | 210 | 194.5 | 0.163 | 0.065 | 3.79 |
| Soleidae | *Austroglossus pectoralis* | T | 45 | 43.3 | 0.375 | 0.049 | 2.85 |
| Sparidae | *Argyrozona argyrozona* | F | 90 | 80.5 | 0.063 | -1.617 | 2.61 |
| Sparidae | *Pachymetopon blochii* | F | 35 | 41.5 | 0.151 | -1.059 | 2.41 |
| Sparidae | *Pagellus natalensis* | F | 35 | 38.1 | 0.212 | 0.294 | 2.49 |
| Sparidae | *Polysteganus undulosus* | T | 100 | 93.0 | 0.282 | 1.442 | 3.39 |
| Sparidae | *Pterogymnus laniarius* | T | 45 | 47.7 | 0.193 | 0.398 | 2.64 |
| Sparidae | *Rhabdosargus globiceps* | F | 50 | 51.6 | 0.233 | 0.759 | 2.79 |
| Sphyraenidae | *Sphyraena barracuda* | F | 180 | 133.6 | 0.171 | 1.437 | 3.48 |
| Trichiuridae | *Trichiurus lepturus* | T | 150 | 146.8 | 0.292 | 0.249 | 3.80 |
| Triglidae | *Trigla capensis* | T | 70 | 71.8 | 0.143 | 0.000 | 2.87 |

[a]Fork = Fork length; T = total length.
[b]The curve depicting the growth of the females did not appear realistic and was omitted.
[c]Probably refers to a ♀, since in the Istiophoridae family, ♀>>♂.

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