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The Relationships Between Different Type of Length Measurements
OF Sharp-beaked Redfish

by

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INTRODUCTION

If commercial statistics as collected by different countries or agencies are to be combined for assessment purposes, they must first be presented in a compatable format. This is of particular importance when using length frequencies and estimating the numbers caught at age in a multi-nation fishery. The redfish length frequencies submitted to NAFO routinely consist of three types of measurements: fork length to the nearest centimetre, total length to the nearest centimetre, and total length to the centimetre below. The purpose of this paper is to present the relationships between these measurements for sharp-beaked redfish so that all frequency data available through NAFO may be utilized, if desired, in future redfish assessment work.

MATERIALS AND METHODS

In addition to the routine Canadian measurement of fork length to the nearest cm (FL), the total length to the nearest cm (TL) and total length to the cm below (TLCB) were determined for each sharp-beaked redfish (Sebastes mentella and S. fasciatus combined) sampled for otoliths during a Canadian stratified-random bottom trawl survey of NAFO Div 3M in February, 1984. A total of 952 fish were measured (461 males, 432 females and 59 unsexed) ranging in FL from 8 to 46 cm (males 16-45 cm, females 16-46 cm and unsexed 8-15 cm). Geometric mean (G.M.) regressions (Ricker 1973) were done of TL and TLCB on FL both for the sexes separated and combined.

RESULTS AND DISCUSSION

The use of G.M. regressions allows both the prediction of Y from X or X from Y. The regression results (Fig. 1 and 2) indicate excellent correlation in all cases. Because the correlation coefficients are very close to 1.0, the slopes (v) in the G.M. regressions are very close to the slopes (b) of least-squares regressions since $v = b/r$ (Ricker 1973). Analysis of the sexed regressions of TL on FL indicated that the slopes are equal ($P \approx 0.5$) (in this paper no significant difference exists if $P < .95$) and that the lines are coincidental ($P \approx 0.8$) and therefore the combined relationship may be used. For TLCB on FL, although the slopes were equal ($P \approx 0.4$), only the lines for males and females are coincidental ($P \approx 0.007$). These lines are also coincidental with the combined line ($P \approx 0.45$) and thus this relationship may also be used. The fact that the unsexed line is not coincidental in the later case is not seen as a problem since fish <15 cm are not routinely found in commercial frequencies. For research frequencies, it is advisable to use the unsexed relationship for fish <15 cm.

REFERENCES

Ricker, W. E., 1973. Computation and interpretation of Biological Statistics of Fish Populations. Bull. Fish. Res. Bd. Can. No. 191. 383 p.
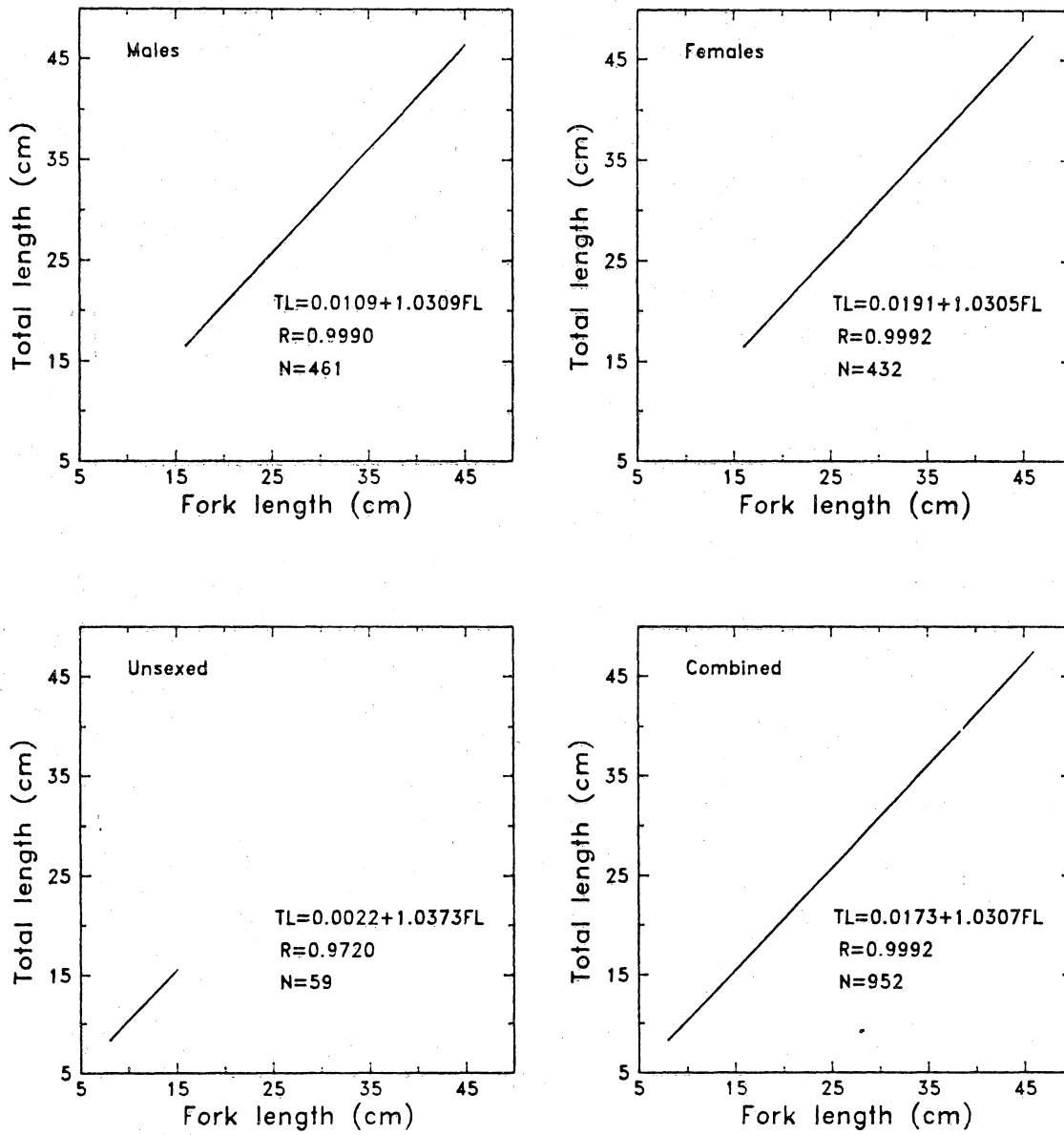
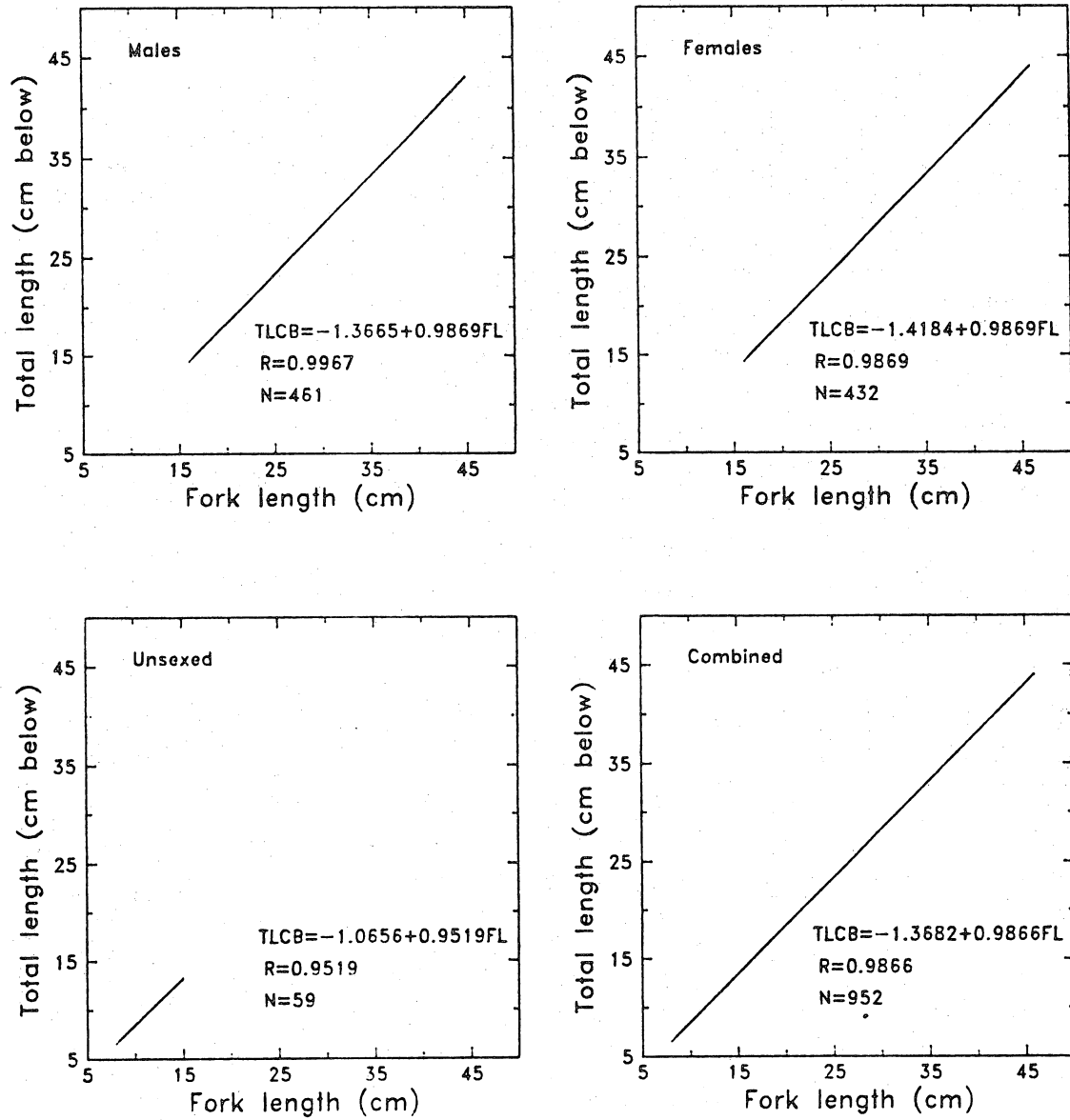Fig.1: G.M. Regressions of total length on fork length.

Fig.2: G.M. Regressions of total length (cm below) on fork length.