



SCIENTIFIC COUNCIL MEETING - June 2001

An Update of the Fishery for Short-finned Squid (*Illex illecebrosus*) in the Newfoundland Area during 2000 with Descriptions of some Biological Characteristics

by

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Abstract

Subarea 3 landings totalled only 310 t in 2000, representing a slight increase from 19 t in 1999 and representing the third consecutive year of very low abundance, with landings of less than 1000 t. Landings in 2000 were exclusively from the inshore Newfoundland jig fishery in Div. 3KL and primarily during September-October. Samples acquired from the commercial fishery at two inshore localities indicated that mean mantle lengths for both sexes were much smaller than in 1998 and were generally comparable with the smallest observed since 1976, for comparable time periods. Coincident with such small size, male sexual maturation was less advanced than in previous years. Small mean length at Newfoundland in 2000 was consistent with small mean weights observed in 2000 from surveys during July on the Scotian Shelf and during autumn on the northeast USA Shelf. Such small size is believed to reflect a low proportion of squid from late spawning.

Introduction

This paper provides an update of the inshore fishery for short-finned squid at Newfoundland (NAFO Subarea 3) during 2000. Landings are provided and broken down by NAFO Division and month. Length composition and (for males) maturity are described based on those biological samples that could be obtained. Yearly catches and biological characteristics have been described for most years between 1965 and 1999 (Mercer MS 1975; Collins and Ennis MS 1978; Hurley et al. MS 1979; Beck et al. MS 1980, MS 1981, MS 1982, MS 1983, MS 1986, MS 1989; MS 1994; MS 1998; Drew et al. MS 1984, MS 1985; Dawe et al. MS 1999, MS 2000).

Materials and Methods

Data on monthly inshore squid landings by NAFO Division were obtained from the Fisheries Systems and Statistics Branch, Department of Fisheries and Oceans, Newfoundland Region. Biological samples were taken from the commercial inshore jig fishery, when available, at New Bonaventure in NAFO Div. 3L and at LaScie in NAFO Div. 3K (Fig. 1). All squid samples were dissected, sexed, and measured in dorsal mantle length (DML) to the nearest 0.5 cm. Maturity stages for males were assigned according to Mercer (MS 1973a). Samples from each site were pooled over biweekly periods for descriptions of length, sex, and maturity composition.

Results and Discussion

Reported Catches

Newfoundland inshore (Subarea 3) landings totalled only 310 t in 2000 (Fig.2), remaining at a very low level (less than 1,000 t) for the third consecutive year following landings of about 12,500 t in 1997 (Dawe et al. 2000). All landings in 2000 were from Div. 3KL and mostly during Sep-Oct.

| NAFO Division | Landings (t) by month | | | | | Total |
|---------------|-----------------------|--------|-----------|---------|----------|--------------|
| | July | August | September | October | November | |
| 3K | 0.07 | 0 | 119.4 | 69.7 | 1.5 | 190.6 |
| 3L | 0 | 0 | 31.2 | 86.1 | 2.4 | 119.7 |
| Total | 0.07 | 0 | 150.6 | 155.8 | 3.9 | 310.3 |

Historically, most of the Newfoundland inshore catch has been derived from Div. 3KL, with the peak month varying between Aug and Oct (Dawe and Hendrickson 1998).

Biological Characteristics

Length frequency distributions for both LaScie (Div.3K) and New Bonaventure (Div. 3L) were unimodal for both sexes (Fig. 3 and 4), as is usually the case for inshore Newfoundland jigged samples (Beck et al 1998). Mean length for both sexes increased throughout Sep-Oct at New Bonaventure (Fig. 3), as well as between late September and mid-October at LaScie (Fig. 4). Seasonal change in size frequencies reflect growth as well as dynamic interchange of individuals within local populations, due to continuous recruitment, emigration and size-related cannibalism. Population interchange frequently result in a decline in mean and modal length late in the fishing season (Dawe and Hendrickson 1998, Beck et al. 1998). Mean mantle length for both sexes was greater at New Bonaventure than at LaScie during both the second half of September and the first half of October.

Mean mantle lengths in 2000 were compared with a time series since 1976 for both September periods for each sex (Fig. 5). Mean lengths for 2000 were generally as small as, or smaller than, those of any other years in the time series. Only in 1991 and 1996 were mean lengths as small, in some cases, as in 2000. Small mean length at Newfoundland in 2000 was consistent with small mean weights observed in 2000 from surveys during July on the Scotian Shelf and during autumn on the northeast USA Shelf (Hendrickson et al. 2001). Such small size is believed to reflect relatively late peak spawning.

Dawe et al. (1999) noted that mean length declined over the period 1976-1992, and has been quite variable in more recent years. It was suggested that large sizes during 1976-80 may be related to relatively early spawning in years of high abundance. Length distributions from the fall survey in SA 5+6 (Dawe and Hendrickson 1998) also indicated that modal length of the largest size group was larger during 1975-80 than during 1981-1997. Dawe et al. (1999) also noted that large size at Newfoundland appeared to be related to high July Subarea 4 survey catch rates. It was suggested that such annual variability in mean size, if due to variable timing of peak spawning, would likely be related to environmental variation.

Sexual maturation of males progressed slowly throughout the 2000 season at New Bonaventure (Fig. 3), relative to in most earlier years (Beck et al 1998, Dawe et al. 1999). Male sexual maturation was not nearly as advanced in 2000 as it was in 1998 (Dawe et al 1999). In most years, most males sampled in late October are mature (Dawe and Hendrickson, 1998). However, mature males were virtually unrepresented in late October samples in 2000 (Fig. 3 and 4). Such great differences in male maturity between years is related to the great size differences noted earlier.

Acknowledgements

We thank Anne-Marie Russell for providing the landings data.

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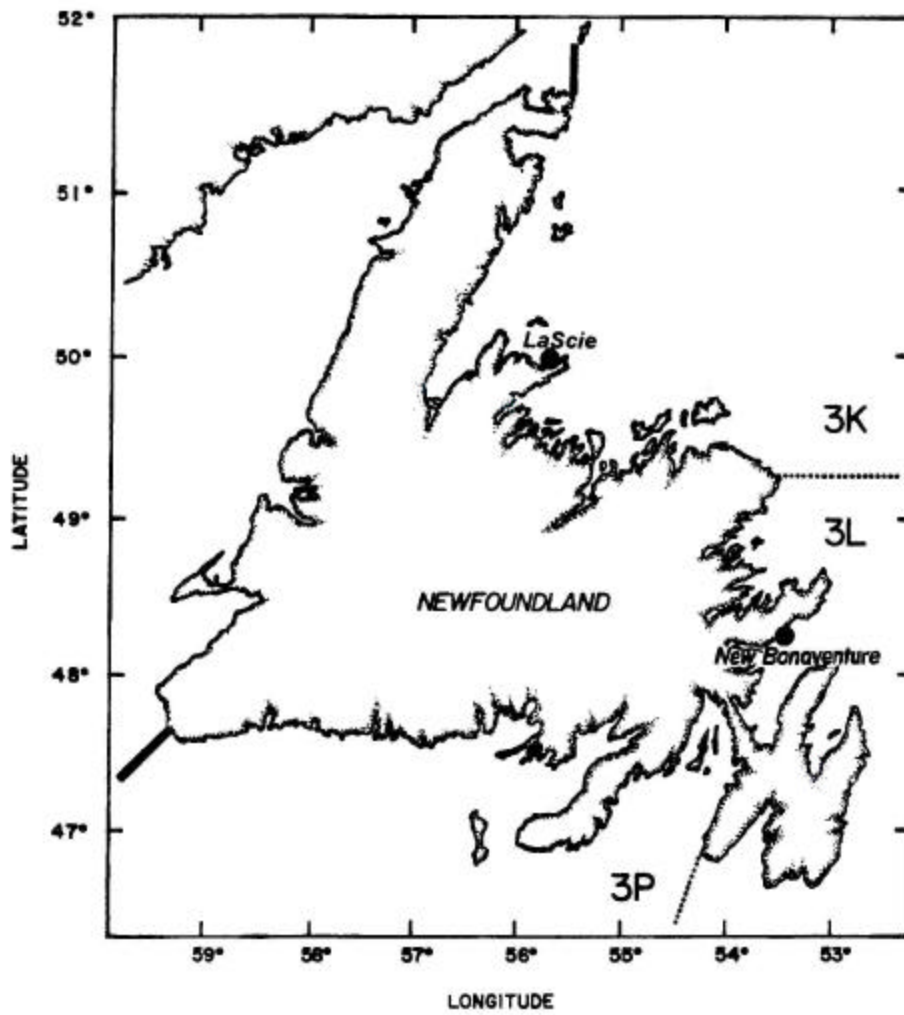


Fig. 1. Map showing location of inshore Newfoundland sampling sites in 2000.

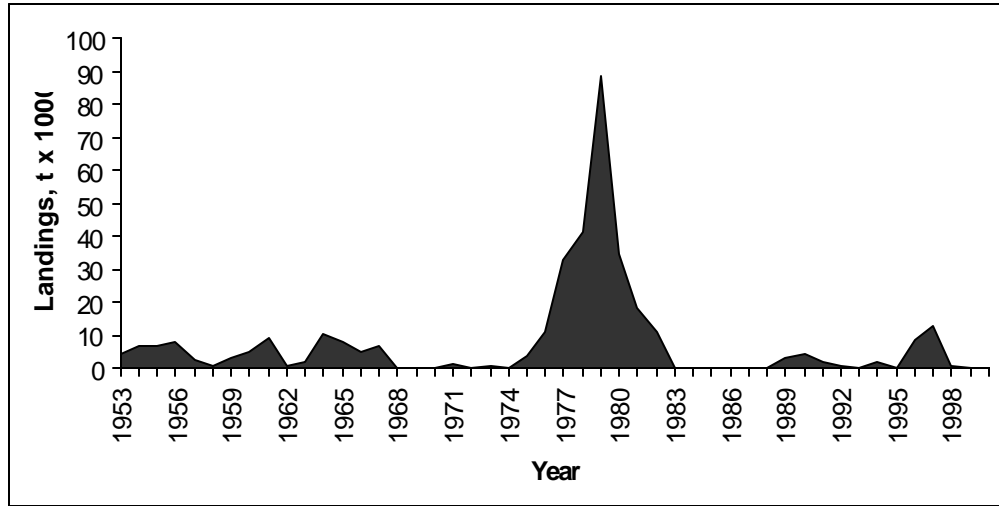


Fig.2. Annual landings of short-finned squid for Subarea 3 for the period 1953-2000.

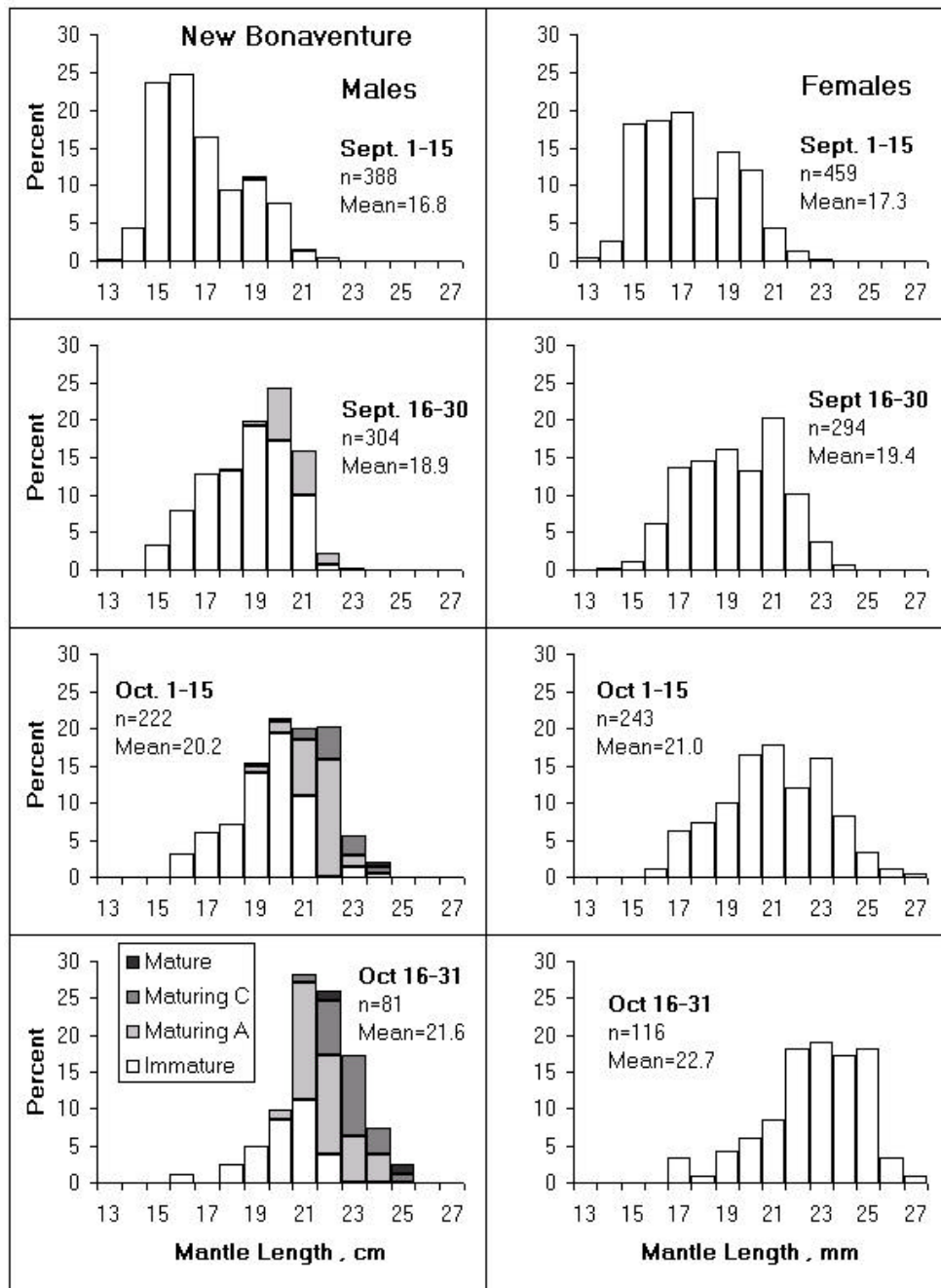


Fig. 3 Mantle length frequency distributions for males, with maturity stages overlain (left), and for females (right), for biweekly periods, from New Bonaventure in 2000.

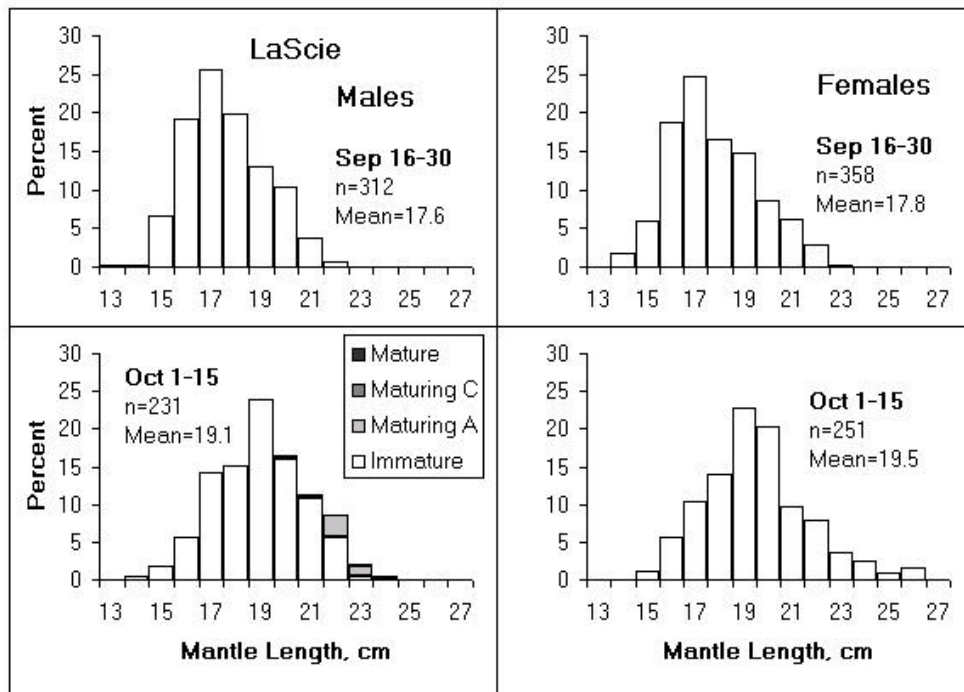


Fig. 4. Mantle length frequency distributions for males, with maturity stages overlain (left), and for females (right), for biweekly periods, from LaScie in 2000.

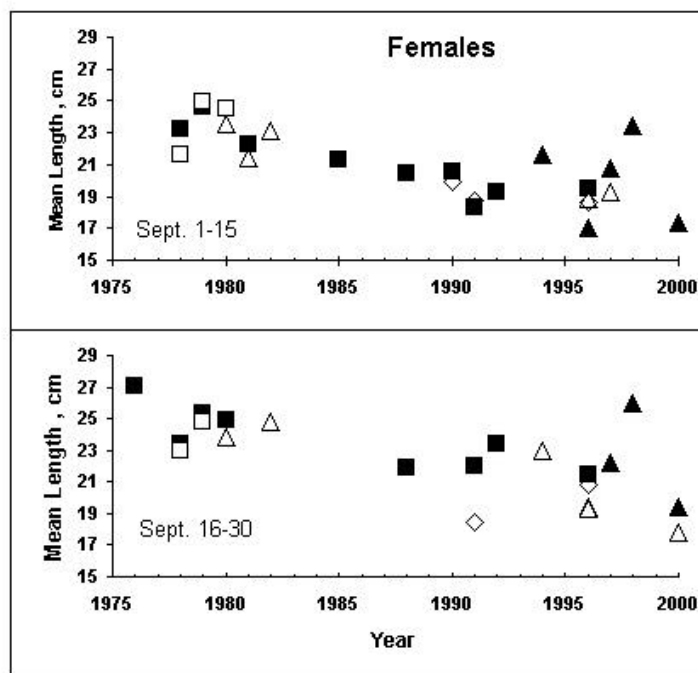


Fig. 5. Annual mean mantle length from each 2-week period of September for males (above) and females (below) by inshore sampling site.