ABSTRACT

The dolphin Coryphaena hippurus is an oceanic epipelagic fish with a worldwide distribution in tropical and sub-tropical waters. Dolphin in the eastern Caribbean have fast growth (4.71 mmSL/day), large maximum size (1208 mmSL) and live for approximately one year. They may be aged by daily growth rings in otoliths. Males are heavier at length, grow faster and reach a larger maximum size than females. Males are larger (735 mmSL) than females (610 mmSL) at sexual maturity, but of similar age (3½ months). Dolphin are multiple spawners with an extended spawning season. Fecundity ranges between 58,000 and 1,243,770 eggs and is positively correlated with fish length. Mature egg size is about 0.97 mm diameter, and is independent of fish size. Gonosomatic indices are lower in males (0.04 - 0.48%) than in females (0.11 - 7.9%). The sex ratio of dolphin catch is biased towards females 2:1 when small fish are landed and 3:1 when large fish are landed. Preliminary estimates of annual total instantaneous mortality (Z) vary from 3.93 to 5.84 and of annual instantaneous natural mortality (M) vary from 2.52 to 3.30. Post-larval flying gurnards and flyingfish are the most common species in dolphin stomachs. Dolphin predators include large tuna, sharks, swordfish and marlin. Polymorphism is shown by 7.6% of enzyme loci. Esterase (EST) and isocitrate dehydrogenase (IDH) were highly polymorphic and phenotypic frequencies at Idh-2 in dolphin from Miami and Barbados were significantly different, indicating genetic separation of the stocks. Dolphin catch records and differences in life history characteristics are consistent with the suggestion that there is a northern and southern stock with migration circuits overlapping in the Virgin Islands.

Dolphin are the most important by weight and revenue of the large pelagics in the Barbados fishery. The fishery is seasonal (Jan. - June) with peak abundance in March/April. Annual total landed weight of dolphin and annual catch per trip have increased and annual total number of fishing trips decreased over the 26 years 1958 to 1983. Catch per standard unit of effort has increased from 1961 to 1982. This may reflect an actual increase in dolphin abundance, or an increase in dolphin catchability. Alternatively, it may result from the increase in fishing efficiency per trip over these years having not been adequately allowed for. Past or present levels of fishing mortality have not apparently affected dolphin abundance in the eastern Caribbean. Assuming knife-edge recruitment of dolphin to the fishery at age 2 months, maximum yield-per-recruit is estimated to be 1.66 kg at a monthly instantaneous fishing mortality (F_{max}) of 0.264. At 4 months, maximum yield-per-recruit would be 2.41 kg at an F_{max} of 0.673.