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# SYNOPSIS OF BIOLOGICAL DATA ON BONITO Sarda sarda (Bloch) 1793 (WESTERN ATLANTIC)

Exposé synoptique sur la biologie de la pélamide Sarda sarda (Bloch) 1793 (Atlantique Ouest)

Sinopsis sobre la biología del bonito Sarda sarda (Bloch) 1793 (Atlántico Occidental)

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# 1 IDENTITY

## 1.1 Taxonomy

### 1.1.1 Definition

Phylum Vertebrata
Subphylum Craniata
Superclass Gnathostomata
Series Pisces
Class Teleostomi
Subclass Actinopterygii
Order Perciformes
Suborder Scombroidei
Family Scombridae
Genus Sarda Cuvier 1829
Species Sarda sarda
(Bloch) 1793

### 1.1.2 Description

Genus Sarda Cuvier 1829

"Body elongate, but rather short and compressed in young specimens. Scales minute, and a small corselet more or less distinct. The caudal keel is thick and naked. Teeth in both jaws are large, compressed, and strongly curved inward, but not trenchant. Near the anterior end of the lower jaw, the row of teeth is bent inwards and approaches the symphysis. Vomer is toothless, but a single row of rather strong and curved teeth on the palatines. Tongue also toothless. Many dark, longitudinal, more or less oblique stripes are found in the dorsal part of the body. Vertebrae of the caudal peduncle have lateral keels. Voracious fish of rather small size in subtropical and tropical waters of both Pacific and Atlantic Ocean. Pelagic." (Kishinouye, 1923:424).

S. sarda

"Description. -- This bonito is shaped much like a small tuna, being thick and stout bodied, about one-fourth as deep as it is long (not counting the caudal fin), and similarly tapering to a pointed snout and very slender caudal peduncle. It is tuna-like also, in that its body is scaled all over, that its caudal peducle has median longitudinal keels, and that its two dorsal fins are so close together that they are practically confluent. But the shape of its fins distinguishes it at a glance from a small tuna, the only regular member of the Gulf of Maine fish fauna, with which it is apt to be confused, its first dorsal being relatively much longer than that of the tuna (about one-third as long as the body, not counting the caudal, and with about 21 spines), and its second dorsal considerably longer than high, whereas the second dorsal is at least as high as it is long in the tuna.

The mouth, too, of the common bonito is relatively larger than that of the tuna, gaping back as far as the hind margin of the eye, and its jaw teeth are larger, with the two to four in the front of the lower jaw noticeably larger than the others. The shape of its first dorsal with nearly straight upper margin marks it off from the oceanic bonito (p. 335), also from the false albacore (p. 336), in both of which this fin is very deeply concave in outline; the uniform scaliness of its body, also, is diagnostic, as contrasted with them.

We need only note further that its first dorsal fin is triangular, tapering regularly backward, with only slightly concave upper edge; that the margins of the second dorsal and anal fins are deeply concave; that it has 7 or 8 dorsal finlets and 7 anal finlets; that its tail fin is lunate, much broader than long; and that its lateral line is not deeply bowed below the second dorsal, but is only wavy.

Color --The color of this bonito is so distinctive as to be a ready field mark to its identity, for while it is steely blue above with silvery lower part of the sides and abdomen, like most of the mackerel tribe, the upper part of the sides are barred with 7 to 20 narrow dark bluish bands running obliquely downward and forward across the lateral line. While young its back is transversely barred with 10 to 12 dark-blue stripes, but these dark crossbars usually disappear before maturity." (From Bigelow and Schroeder 1953:337-338)

## 1.2 Nomenclature

### 1.2.1 Valid scientific name(s)

Sarda sarda (Bloch) 1793

### 1.2.2 Synonyms

Scomber sarda Bloch, 1793
Scomber mediterraneus Bloch and Schneider, 1801
Scomber pelamitus Rafinesque, 1810
Sarda sarda, Jordan and Evermann, 1896

### 1.2.3 Standard common names, vernacular names

Standard Common Names

| | |
|---|---|
| Brazil | Serra |
| Cuba | Bonetta |
| United States | Atlantic Bonito |

Other Common Names and Vernacular Names

| | |
|---|---|
| Brazil | - - - |
| Cuba | Madrigal |
| United States | Common bonito, bonito skipjack, blue bonito, northern bonito, horse mackerel, bonejack, little tunny, bloater, bone eater, Boston mackerel |

## 2 DISTRIBUTION

### 2.1 Delimitation of the total area of distribution and ecological characterization of this area

Sarda sarda in the western Atlantic is found in the tropical and subtropical regions, from about 50°-55° N to 35° S.

### 2.2 Differential distribution

#### 2.2.1 Areas occupied by eggs, larvae and other junior stages: annual variations in these patterns, and seasonal variations for stages persisting over two or more seasons. Areas occupied by adult stages; seasonal and annual variations of these

There is no information available on areas occupied by eggs.

- Larvae

Klawe (1961) caught a larva of Sarda sarda between Cape Hatteras and the Bahama Islands. It was 34 mm long.

- Juveniles

Two juvenile stages of Sarda sarda 64 and 67 mm long were captured in the Gulf of Mexico (Klawe and Shimada, 1959). Individuals 25-35 cm long were not uncommon in catches of mackerel of the Mirimachi River, New Brunswick. (McKenzie, 1959).

- Adults

Adults have been reported in waters off Nova Scotia (Mather and Gibbs, 1957) but are said to be rare in the Gulf of Maine. (Bigelow and Schroeder, 1953) They occur in fair numbers from Cape Cod and have been reported on the United States coast south to Florida; in the Bahamas; Cuba; the Leeward and Windward Islands; Tobago and Trinidad, Venezuela, Brazil, Uruguay and Argentina. (Rosa, 1950:42) Collections of the United States Fish and Wildlife Service M/V Oregon included Sarda sarda from an area of the Campeche Bank in the Gulf of Mexico (Areas Bay, 20° 12' N, 91° 59' W). (Springer and Bullis 1956). The occurrence of juveniles in the Gulf of Mexico, as reported by Klawe and Shimada (1959) also indicates that the adults likely occur in this area.

## 3 BIONOMICS AND LIFE HISTORY

### 3.1 Reproduction

#### 3.1.6 Spawning

Sarda sarda is believed not to spawn in the northern part of its range; Bigelow and Schroeder (1953) have not observed spawning in the Gulf of Maine. South of there it spawns in June. Winter spawning takes place in the area off south Florida, Klawe (1961) having captured an individual 34 mm in length in the southern part of the Florida Current. Juveniles were caught in the Gulf of Mexico in March (Klawe and Shimada, 1959).

### 3.2 Larval history

Klawe and Shimada (1959) collected two young Sarda sarda in the Gulf of Mexico. These were 64 - 67 mm long, and the latter is figured in their paper. This shows the dark vertical bars which are characteristic of the young of this species. Nichols and Breder (1927) noted that young Sarda 5 to 6 inches, were taken off Orient, New York, in September.

### 3.3 Adult history

#### 3.3.6 Greatest size

While Sarda sarda is said to attain a length of over 3 feet and a weight of 12 pounds (Breder, 1948; Bigelow and Schroeder, (1953); the usual size according to Rivas, (1951) is 2 to 4 pounds.

### 3.4 Nutrition and growth

#### 3.4.1 Feeding (time, place, manner, season)

Sarda sarda is a predaceous feeder pursuing fish with great vigor. It often jumps while in pursuit of prey.

#### 3.4.2 Food (type, volume)

It eats squid and fish principally (Breder, 1948:126). Kinds of fish eaten include mackerel, alewives, menhaden, and other small fish such as launce and silversides. (Bigelow and Schroeder, 1953:338)

### 3.5 Behaviour

#### 3.5.2 Schooling

Sarda sarda is a schooling fish, travelling in large aggregations. It occurs in coastal open sea areas. It is usually encountered near the surface, but is occasionally caught near the bottom by trawls or by hook and line.

# 5 EXPLOITATION

## 5.1 Fishing equipment

There is no sizable organized commercial fishery in the western Atlantic specifically directed to the capture of Sarda sarda. The species is, however, caught on the Atlantic coast of the United States by haul seines, gill nets, hook and line, and pound nets.

Various small craft are used in catching this species.

## 5.2 Fishing areas

Commercial catches of small size are made on the U.S. coast from Massachusetts to Florida (Anderson and Stolting, 1952). It is also caught for commercial sale in various parts of the Caribbean and the South American coast.

## 5.3 Fishing seasons

In the northern part of the United States Atlantic coastline most commercial catches of Sarda sarda are made in the summer. In the south fishing takes place throughout the year (Anderson and Stolting, 1952).

## 5.4 Fishing operations and results

### 5.4.3 Catches

Bonito is not an important commercial fish in waters of the Atlantic coast of the United States. In 1950, 123,500 pounds were landed in this area. In 1958 this total was only 51,000 pounds and in 1959 it was 252,000 pounds.

No separate statistics of landings of bonito are available for other western Atlantic countries, but it is known that small quantities are caught and sold in the Caribbean and South America.

McKenzie (1959) noted that Sarda was not uncommon off the Mirimachi River New Brunswick, amounting to 8 to 10 percent of the mackerel catches. These fish were 25 to 35 cm long.

Catches of bonito landings for 1950 are as follows:

Haul Seines

| | # | $ |
|---|---|---|
| New Jersey | | |
| Virginia | 8,500 | 1,098 |
| North Carolina | 7,800 | 235 |
| Florida | 1,600 | 80 |
| Total | 17,900 | 1,413 |

Gillnets

| | # | $ |
|---|---|---|
| New Jersey | | |
| Virginia | | |
| North Carolina | | |
| Florida | 20,000 | 1,000 |
| Total | 20,000 | 1,000 |

Hand Lines, troll and trawl

| | # | $ |
|---|---|---|
| New Jersey | 100 | 20 |
| Virginia | | |
| North Carolina | | |
| Florida | 42,400 | 2,070 |
| Total | 42,500 | 2,090 |

Pound nets and floating traps

| | # | $ |
|---|---|---|
| New York | 13,900 | 1,700 |
| New Jersey | 134,100 | 4,555 |

Otter trawls

| | # | $ |
|---|---|---|
| New York | 100 | 5 |
| New Jersey | 100 | 30 |