

ISSN 0048-377X

Volume 22

1991

The PHILIPPINE
JOURNAL of FISHERIES



Published by the

BUREAU OF FISHERIES AND AQUATIC RESOURCES

Department of Agriculture

Arcadia Building, 860 Quezon Avenue, Quezon City, Philippines

THE PHILIPPINE JOURNAL OF FISHERIES

OFFICIAL SCIENTIFIC PUBLICATION OF THE BUREAU OF FISHERIES AND AQUATIC RESOURCES

VOLUME 22

1991



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The Journal is issued annually. Subscription rates are \$10.00 for foreign countries; ₱70.00 in the Philippines, including postage, or ₱50.00 if obtained personally at the BFAR.

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CONTRIBUTION TO THE BIOLOGY OF "AYUNGIN", *THERAPON PLUMBEUS* (KNER)

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ABSTRACT

The "ayungin" comprises more than 70% of the total fish fauna in Laguna de Bay. The fish is an omnivore, with shrimps as its major food item. Sexual maturity is attained at 3.6 cm for males, and 4.1 cm for females. The monthly average number of eggs ranges from 19,886 to 55,864 per fish. Spawning takes place throughout the year, with the peak period in August.

INTRODUCTION

The silvery theraponid, *Therapon plumbeus* (Kner), locally known as "ayungin", is the only freshwater species under the Family Theraponidae. It is the most important economic species of fish in Laguna de Bay. It ranks first in abundance and is present in the lake all year round.

Very few studies have been done on "ayungin". Some biological aspects and life history studies of the fish were conducted by Enriquez (1960, 1964) and Yapchiongco and Enriquez (1963). Mane (1934) also made studies on its spawning and feeding habits.

This paper aims to supplement and update the available information on the species.

MATERIALS AND METHODS

The materials used in this study were taken from Laguna de Bay. A total of 1,039 "ayungin" specimens were examined for analysis of food and feeding habits. For sexual maturity determination, 1,206 pairs of gonads were analyzed.

The samples were sorted and grouped by length (in cm) into seven classes at 1.9 cm size interval.

RESULTS AND DISCUSSION

Food and Feeding Habits

The smallest specimen examined was 3 cm long, while the largest measured 16.9 cm.

The fish is an omnivore, eating a wide variety of organisms. Among the animal components of its stomach content are crustaceans (which include shrimps, amphipods and ostracods), zooplankton, snails, annelids, aquatic insects and fishes. The plant components are phytoplankton, macroscopic algae and other vascular plants. Fish scales and sand particles were also among the food items, but in negligible amounts.

Tables 1 and 2 show the number and volume of organisms taken in by the different size groups of *Therapon*. The crustaceans composed the greatest bulk of food, by number and volume. Of these, more than 80% were shrimps (mostly in their young stage) while about 20% were amphipods and ostracods.

A 5-cm fish starts to feed on shrimps at an average of 1 shrimp per fish. The bigger fish consumes more, at an average of 10 shrimps per fish.

T. plumbeus becomes cannibal at 7 cm when it feeds on goby fry or "dulong". The larger fish eat goby and their own kind.

Of the aquatic insects, midge larvae composed the greatest number and fed on by all the size groups. Dragonfly nymphs and waterbugs were rarely present in the food items.

Annelids were also a food item in all the size groups, but in fair quantities. Snails, on the other hand, were consumed only by the big "ayungin".

Numerically, plankton ranked first among the food items. Of the zooplankton, the cladocerans accounted for the major portion, comprising more than 70% of the total population. The group was mainly represented by *Bosmina* and *Diaphanosoma*. About 70% of the phytoplankton was composed of diatoms, represented by *Nitzschia*, *Cyclotella* and *Melosira*. These organisms were taken in by all the size groups.

Ceratophyllum, *Elodea*, *Cladophora* and other unidentified plants also formed important food items of *T. plumbeus*.

Population

T. plumbeus is the most abundant fish in Laguna de Bay, comprising more than 70% of the total fish population in the lake. From the landed catch data, the fish constituted the greatest bulk from motorized push net catch with sizes ranging from 1 to 12 cm.

Table 1. Average number of major food items of *Therapon plumbeus* by size group.

| Size Group (cm) | No. of Fish Examined | Crustaceans | | | Fishes | | Insects | | Annelids | Snails |
|--------------------|-------------------------|-------------|----------|----------|----------|------|----------------------|-------|----------|--------|
| | | Shrimp | Ostracod | Amphipod | Therapon | Goby | Goby Fry (Dulong) | Midge | | |
| 3.0-4.9 | 82 | - | 1 | 1 | - | - | - | - | 1 | - |
| 5.0-6.9 | 168 | 1 | 1 | 3 | - | - | - | - | 1 | - |
| 7.0-8.9 | 203 | 1 | 1 | 5 | - | - | - | - | 1 | - |
| 9.0-10.9 | 104 | 2 | 1 | 6 | - | - | 1 | - | 2 | 2 |
| 11.0-12.9 | 286 | 10 | 1 | 7 | 1 | - | 11 | - | 1 | 1 |
| 13.0-14.9 | 168 | 8 | 1 | 2 | - | 1 | 5 | - | 2 | 2 |
| 15.0-16.9 | 28 | 4 | 1 | 1 | 1 | 6 | - | - | 1 | 8 |
| All sizes | 1,039 | 26 | 7 | 25 | 2 | 11 | 25 | 2 | 9 | 13 |

Table 2. Average volume (in cc) of food items of *Therapon plumbeus* by size group.

| Size Group (cm) | No. of Fish Examined | Crustaceans | | Therapon | Fishes Goby | Goby Fry (Dulong) | Midge | Insects | | Waterbug | Snails | Scales |
|-----------------|----------------------|-------------|--------|----------|-------------|-------------------|-------|-----------|------|----------|--------|--------|
| | | Amphipod | Shrimp | | | | | Dragonfly | | | | |
| 3.0-4.9 | 82 | - | - | - | - | - | - | - | - | - | - | 0.01 |
| 5.0-6.9 | 168 | 0.01 | 0.10 | - | - | - | - | - | - | - | - | 0.05 |
| 7.0-8.9 | 203 | 0.04 | 0.10 | - | - | - | 0.01 | - | - | - | 0.20 | - |
| 9.0-10.9 | 104 | 0.18 | 0.24 | - | - | 0.12 | 0.01 | 0.10 | - | - | 0.10 | - |
| 11.0-12.9 | 286 | 0.14 | 0.33 | 0.30 | - | 0.28 | 0.02 | - | 0.08 | - | 0.40 | 0.02 |
| 13.0-14.9 | 168 | 0.02 | 0.37 | - | - | 0.23 | 0.03 | 0.20 | - | - | - | - |
| 15.0-16.9 | 28 | - | 0.84 | - | 0.50 | 0.40 | - | - | - | - | - | - |
| All sizes | 1,039 | 0.39 | 1.98 | 0.30 | 0.50 | 1.03 | 0.07 | 0.03 | 0.08 | 0.08 | 0.75 | 0.03 |

The dominant size group ranged from 3 to 6 cm. The largest fish was 18 cm, taken from fish corral and gill net catch. Moreover, majority of the fish catch belonged to 6 to 10 cm size group. For the gill nets, however, more than 50% comprised sizes from 9 to 11 cm.

Monthly size distribution showed that larger fish (8 to 15 cm) were caught from August to January while the smaller ones (2 to 7 cm) predominated from March to May. Records showed that the size composition of "ayungin" remained almost constant. From 1960 to the present, the sizes ranged from 1 to 18 cm with an average size of 9 cm. The data also showed that the male is relatively smaller than the female.

Fecundity

The eggs present in the ovary of the fish were grouped into immature (I), maturing (II) and mature (III) stages. The immature eggs are polygonal in shape with sizes ranging from 0.06 to 0.21 mm. Maturing eggs are round with sizes ranging from 0.22 to 0.51 mm. Mature eggs are also round with sizes ranging from 0.52 to 0.75 mm in diameter.

Table 3 shows the monthly average length, weight and number of eggs of "ayungin" by stage of development. Like in most fishes, the number of eggs of "ayungin" increases with the increasing size of the fish. However, in some cases, the number of eggs varies even with increase in size of the fish. This can be explained by the fact that an individual

Table 3. Monthly average length, weight and number of eggs of *Therapon plumbeus*.

| Month | Length (cm) | Weight (g) | Number of eggs | | |
|-----------|-------------|------------|------------------|-------------------|------------------|
| | | | Stage I Immature | Stage II Maturing | Stage III Mature |
| January | 11.2 | 23.5 | 5,044 | 11,094 | 3,698 |
| February | 11.4 | 24.1 | 7,079 | 11,438 | 5,557 |
| March | 11.9 | 27.1 | 7,657 | 12,421 | 5,434 |
| April | 10.9 | 21.3 | 5,729 | 10,413 | 2,709 |
| May | 9.7 | 14.2 | 4,196 | 6,859 | 5,364 |
| June | 12.3 | 27.5 | 8,887 | 16,797 | 6,150 |
| July | 10.8 | 22.1 | 9,244 | 14,202 | 8,061 |
| August | 11.8 | 30.6 | 14,441 | 25,679 | 15,744 |
| September | 12.2 | 33.9 | 15,934 | 25,346 | 11,980 |
| October | 11.9 | 29.4 | 12,697 | 20,548 | 9,968 |
| November | 11.4 | 24.9 | 10,832 | 15,132 | 6,144 |
| December | 11.0 | 21.6 | 9,112 | 12,906 | 3,556 |

fish spawns several batches of eggs during the season. It is possible that some of the fish studied have already spawned partially before they were collected. The number of eggs varies monthly. The highest number was noted in August, at an average of 55,864 and the lowest was registered in May with an average of 16,419.

Sexual Maturity

In the immature stage, both the ovaries and testes are small, barely reaching one-half of the body cavity. The ovaries are slender and elongated, usually reddish with no visible ova. The testes are small, strap-like and transparent to translucent.

Maturing ovaries are bigger than immature ones. Yolking has started giving the ovaries pale yellow to orange color. The testes, on the other hand, are enlarged and opaque white in color. The lateral margins become lobulated.

Mature gonads fill the body cavity which is usually distended in female. The blood vessels are very distinct. When the body cavity is slightly pressed, the orange translucent eggs flow out in the case of the female, and white creamy sperms in the case of the mature males.

In the spent stage, ovarian walls are loose. The eggs are free in the lumen, thus they seem to be suspended in a fluid-like substance. The small ovaries are generally reddish in color and very soft. The lateral margins and some portions in the enlarged testes are now translucent.

The fish reached maturity at 3.6 cm in males and 4.1 cm in females.

Spawning

All throughout the year, the eggs were at various stages of development which would indicate that the fish is a partial spawner. Figure 1 shows the total number of mature eggs (Stage III) per month. The fish seemed to spawn throughout the year as evidenced by the presence of mature eggs from January to December. Slow spawning activity was observed in the summer months, gradually rising during the rainy months until the peak period in August. Furthermore, the abrupt ascent of the graph also indicates the rapid rise in the spawning activity of the fish from August to October. However, from December to April, there is a gradual decrease in the spawning activity.

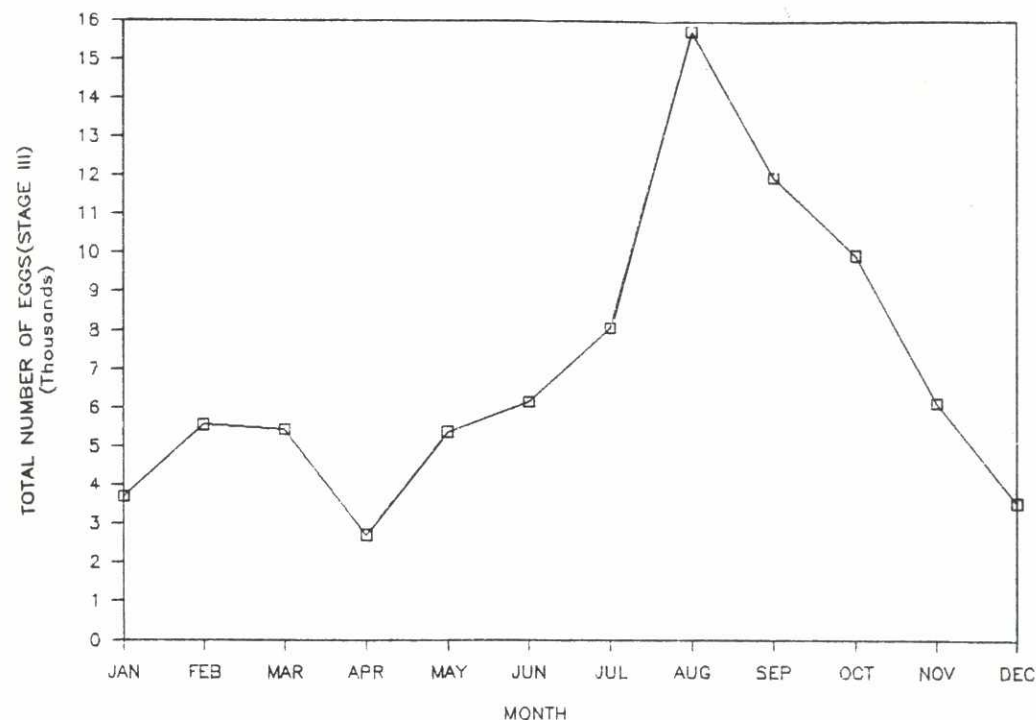


Fig. 1. Average number of mature eggs of *Therapon plumbeus* per month, 1980.

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