

Chapter 2-5

Fish of Lake Biwa

Abstract

One of the major characteristics of the fish that live in Lake Biwa is the existence in the lake of as many as 16 endemic species. Species that have evolved in spots such as the unique offshore and shore reef environments of Lake Biwa and species in Japan that have survived only in Lake Biwa are closely tied in with the long history of the lake.

Keyword: Endemic species

1. Lake Biwa, Treasure House of Freshwater Fish

Shiga Prefecture is currently home to 78 species of freshwater fish. Excluding invasive species that have come from inside and outside the country, there are 63 native species, approximately 45 of which live in Lake Biwa. No other lake or reservoir in Japan can boast so many freshwater fish, making Lake Biwa truly “a treasure house of fish.”

2. Characteristics of Fish in Lake Biwa

A major characteristic of the fish inhabiting in Lake Biwa is the existence of as many as 16 endemic species such as the Biwa catfish(Fig. 2-5-1) and the round crucian carp (Fig. 2-5-2) (Table 2-5-1). These endemic species fall into one of two categories as follows.

2.1 Species of Fish that Evolved in the Environment of the Present-day Lake Biwa

These species live in the characteristic environments of Lake Biwa found in spots such as the offshore areas and reefs. And they have evolved into new species as they adopted a unique lifestyle in such environments. It is believed that species such as the Biwa minnow and the oily minnow evolved from ancestral species that live in the rivers of the plains around Lake Biwa.

2.2 Species of Fish that Have Survived Only in Lake Biwa Down

through the Long Years of History

These species have survived only in Lake Biwa throughout the long history of the Japanese Archipelago and are known as “relict species.” Fossils closely resembling the Biwa catfish have been discovered in the layers of the old Lake Biwa of about 3.5 million years ago and it is believed that this species lived before the present-day Lake Biwa was formed.

As well as these endemic species, inhabitants of the lake include species such as the pale chub and some bitterlings also widespread in other regions, further enriching the fish fauna of Lake Biwa.

3. The History and Environment of Lake Biwa that Gave Birth to Endemic Species

Why are there so many endemic species in Lake Biwa? The reason is closely tied to the history of Lake Biwa that is said to span approximately 4 million years. Over the long years of the history of the lake, a wide diversity of environments formed, creating a repeating cycle of the birth and extinction of a great many organisms.

It is believed that it is because this long history of changing environments and organisms has continued to this day, the endemic species of Lake Biwa that exist in no other lakes and their diversity have developed.

4. Present-day Species of Fish in Lake Biwa

The activities of mankind over the last

10 to 20 years have brought about major changes in the ecosystem of Lake Biwa. In particular, phenomena such as the destruction of habitats and the appearance of increasing numbers of fish from other countries have seriously disturbed the lake's ecosystem, leading to a marked

decline in the numbers of native fish currently inhabiting the lake, including endemic species. It is essential that we take steps to achieve goals such as the restoration of the aquatic environment to conserve the lake for future generations.

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Fig. 2-5-1 Biwa catfish



Fig. 2-5-2 Round crucian carp

Table 2-5-1 Main habitats and spawning grounds of the endemic species and subspecies of Lake Biwa

	Endemic Species, Subspecies	Main Habitats in Lake Biwa	Main Spawning Grounds
1	Biwa salmon	Offshore (Cold water zone)	Feeder rivers
2	Willow minnow	Shore-Offshore (Surface-middle layer)	Lake Biwa shores, attached lakes
3	Sugo gudgeon	Shore-Offshore (Bottom layer)	Lake Biwa shores, attached lakes
4	Biwa minnow	Shore (Reefs-Low sandy area)	Lake Biwa shores, feeder rivers
5	Oily minnow	Shore (Reefs)	Lake Biwa shores
6	Round crucian carp	Offshore (Bottom layer)	Lake Biwa shores, attached lakes, paddy field
7	Deepbodied crucian carp	Offshore (Surface-middle layer)	Lake Biwa shores, attached lakes
8	Biwa culter	Shore (Vegetation zone)	Lake Biwa shores, attached lakes
9	Yodo gudgeon	Shore (Bottom layer)	Attached lakes, flood plains?
10	Biwa catfish	Offshore (Surface-middle layer)	Lake Biwa shores
11	Rock catfish	Shore (Reefs)	Lake Biwa shores
12	Large striated striped loach	Shore (Sand-Pebbly zone)	Lake Biwa shores, paddy field zones
13	Biwa small striated spined loach	Shore (sand-Pebbly zone)	Lake Biwa shores, paddy field zones
14	Biwa yellow gill goby	Shore (Surface-middle layer)	Lake Biwa shores
15	Biwa goby	Offshore (Bottom layer)	Lake Biwa shores
16	Biwa sculpin	Shore (Pebbly zone)	Lake Biwa shores, feeder rivers