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Japanese sea cucumber *Cucumaria japonica* in the far eastern seas of Russia

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Most commercially harvestable species of sea cucumbers belong to the order Aspidochirotida and are basically distributed in the tropics.

The only two representatives of the order Dendrochirotida occur far to the north. One of them is the Japanese cucumaria, *Cucumaria japonica*, which is distributed in the far eastern seas of Russia.

The Japanese cucumaria (called 'kinko' in Japanese) is a fairly large sea cucumber (Fig. 1). Its body length is up to 20 cm, the live weight is up to 1.5 kg (average 0.5 kg), and the weight of the body wall is 20 per cent of the total weight. The body is roundish, smooth, with 5 rows of tube feet. Its colour is grayish purple, but in some regions pure white specimens can be found.

The sea cucumber can be found at depths of 5 to 300m and in temperatures ranging from –1.8 ° to 18.0°C. The young specimens prefer to inhabit kelp beds and shallow-water habitats warmed thoroughly in summer time. The adults prefer to inhabit sites off the open coast with rocky or muddy substrate. The cucumaria are distributed randomly on the bottom, but sometimes congregate in aggregations of up to several hundreds. The highest registered density of the animals is 40 ind / m^2.

The cucumaria is usually almost immobile. Accordingly to data surveys the aggregations of sea cucumbers move to shallow sites where the sea becomes warmer. For instance, potential harvestable congregations are known to appear off the West Kamchatka coast in the middle of May. They feed on seston that settles on their treelike branched tentacles.

The cucumaria is gonochoric (separated sexes). It can produce up to 300,000 eggs; they are green, very large (500 µm), have the ability to float and go up to the surface during spawning. Embryonic and larval development is observed in the upper water-layer and is probably short, but has been little studied. The spawning seems to occur twice a year, in April–June and September–October.

The Japanese cucumaria is distributed in the northern part of Japan, along the continental coasts of the Sea of Ochotsk and Sea of Japan, off the Kuril Islands and the Kamchatka Peninsula, and in the Bering Sea at least to Northern Kamchatka in Russia (its distribution further to the north is not known).

The resources of this species are fairly significant. The predicted possible catches in the main fisheries zones for 1994 were: Sea of Japan: 2,300 t; Kuril Islands: 2,000 t; Sea of Ochotsk: 11,800 t. Presently these stocks are very little exploited and the real total catch appears to be no more than several hundred tons. It is difficult to present precise catch data since the cucumaria is targeted by small-scale fisheries and most of the catch is utilised and processed on the spot.

The fishing method traditionally used to catch the cucumaria is trawling, so while harvesting it is important to take into account the profile of the bottom. It is fairly often harvested in localities characterised not by high density of sea cucumbers, but by a suitable bottom-profile for trawling. Fishermen use the same standard bottom trawls that are used to catch flounders and other bottom fishes.

The Japanese cucumaria is rarely used as the dry product—trepang. The Japanese consume it raw. In Russia all harvested cucumaria is boiled, sliced in small pieces and sold in local shops as a salad with the addition of the seaweed *Laminaria japonica* ('sea cabbage') and various spices. The second way of preparing cucumaria is to can them, sometimes mixed with kelp.

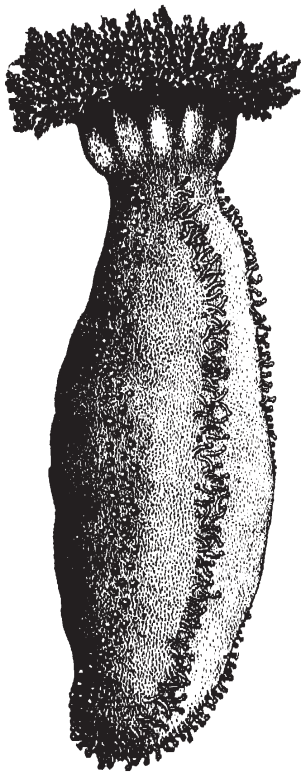

Figure 1:
***Cucumaria japonica*,**
the Japanese sea cucumber

In the Orient the cucumaria, like other species of sea cucumber, is reputed to be both a delicacy and a valuable product for pharmacology. The research data obtained by Vladivostok scientists have shown that this opinion is fairly well-grounded. The cucumaria, like other species of sea cucumbers, contains triterpene glycosides that have marked biological effects (Kalinin, V. I., V. S. Levin & V. A. Stonic, 1994). These effects are similar to those of the legendary herb zhen-shen. These chemicals—obtained from the solution left after boiling the cucumarias, since glycosides are soluble in water—are used in Russia for the production of medicines (for domestic animals) and as an additive in toothpastes, creams, etc.

The use of Japanese cucumaria in Russia has a great potential. Undoubtedly, unlike some of the most valuable species of sea cucumber that are said to be over-exploited, the exploitation of the Japanese sea cucumber *Apostichopus japonicus*—of which the present legal total catch in Russia is only 50t—can be expected to grow gradually.

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