

regarding the disconnecting of John from the respirator.

Part IV (Role-playing the court hearing)—Divide the class into two groups. One group is to defend the parents' point of view. They are to prepare some statements to show that disconnecting the respirator would not be homicide. The other group is to represent the point of view of the medical team. (Each group may elect one or more spokespersons to present their case. Encourage your students to simulate a court hearing.)

A few questions that you may want your students to consider as they prepare their defense or counterarguments are:

1. How is the John Doe situation

similar to "The Beating Heart" demonstration?

2. What is the definition of life and death?
3. Is the present legal definition of death in your state adequate to deal with modern medicine?

You are to role-play the judge in this court case. You are to derive your decision based on the information presented by each group.

Discussion

This activity could lead into a discussion about a legal definition of death. Some states have already adopted legislation of this type, while others are either in the process of debating the issue or have not yet addressed it.

Your students could be invited to find out whether their state has legislation that defines death. If such legislation exists, they could be given time to discuss some of the possible implications this legislation could pose to them and others in their state. If their state does not have a legal definition of death, a discussion could be initiated regarding some potential problems that could arise from an absence of this type of legislation.

Note: The "Alive or Dead?" activity is reprinted by permission from *Science and Societal Issues: A Guide for Science Teachers* by Charles R. Barman, John J. Rusch, and Timothy M. Cooney ©1981 by the Iowa State University Press, Ames, IA 50010.

Transparency Master: Crustaceans Parasitic on Fishes

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Most commercial and sport fishermen, especially those who frequent marine waters, are well acquainted with parasitic crustaceans scurrying about rapidly over the external surface of fishes. Sportsmen often refer to them as "fish lice" or "sea lice." Students of biology might also want to become familiar with these curious creatures, and would probably find it fascinating to observe and collect them. Identification of parasitic crustaceans to their general taxon (e.g., Copepoda, Branchiura, and Isopoda) is not difficult, and might add interest to an assignment on the invertebrates or arthropods. The accompanying plate illustrates some of the more common marine types from the coastal waters of California, and should be a useful aid in a discussion on symbiosis and related topics.

Copepods are perhaps the most common parasitic crustaceans and are found on both freshwater and marine fishes. Many copepods are quite active and crawl about freely over the external surface. Others are adapted for a sessile existence and become permanently anchored to a particular organ or a specific site on the body. *Caligus* sp. (fig. 1) and *Lepeophtheirus* sp. (figs. 2 and 4) are motile, whereas *Phrixocephalus* sp. (fig. 3), *Peniculus* sp. (fig. 5), and *Pandarus* sp. (fig. 7) represent less active examples.

Branchiurans superficially resemble copepods, but taxonomists now prefer separating the two. Freshwater and marine forms are prevalent in North America, with *Argulus* sp. (figs. 8 and 9) being the most common variety.

Isopods of the genus *Lironeca* (fig. 6) are generally larger than copepods and branchiurans. They

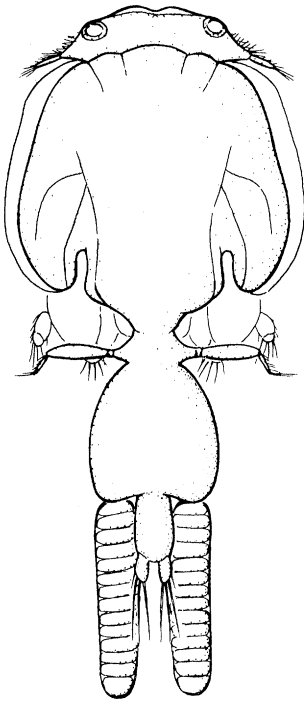
are frequently located on the gills and in the operculum; however, the mouth, fins, and external surface may also be infested.

Reference

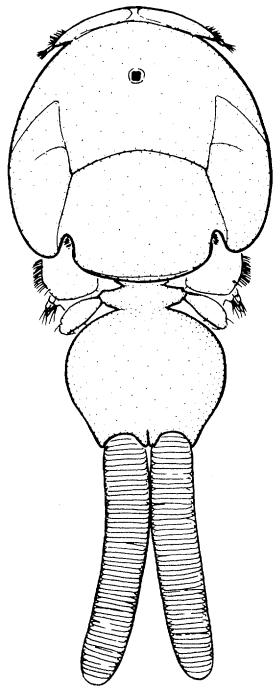
KABATA, Z. 1970. Crustacea as enemies of fishes. In Snieszko, S.F., and Axelrod, H.R. (eds.) *Diseases of fishes, book 1*. Neptune City, N.J.: T.F.H. Publications.

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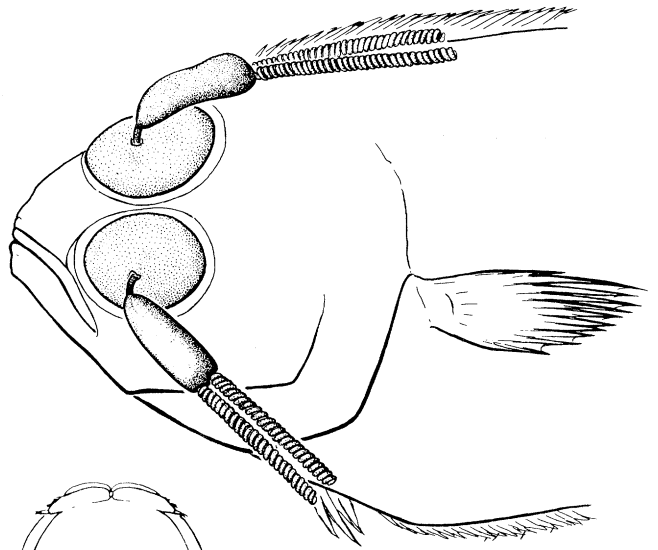
1. *Caligus* sp., dorsal view of a female.
2. *Lepeophtheirus* sp., dorsal view of a female.
3. *Phrixocephalus* sp., embedded in the eyes of a sole.
4. *Lepeophtheirus* sp., dorsal view of a male.
5. *Peniculus* sp., embedded in the fin of a rockfish.
6. *Lironeca* sp., dorsal view.
7. *Pandarus* sp., attached to the fin of a shark.
8. *Argulus* sp., dorsal view.
9. *Argulus* sp., ventral view.



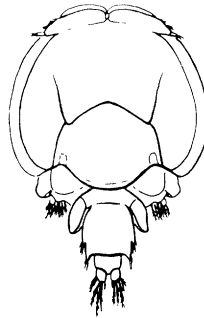
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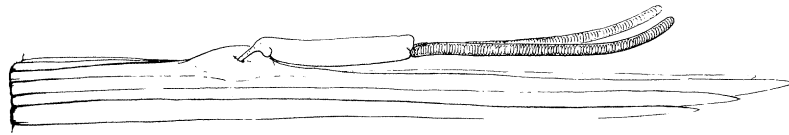
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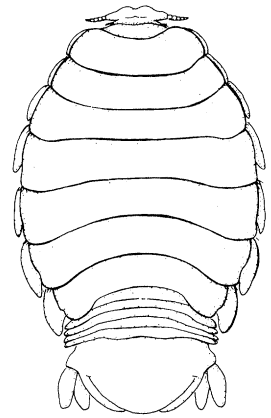
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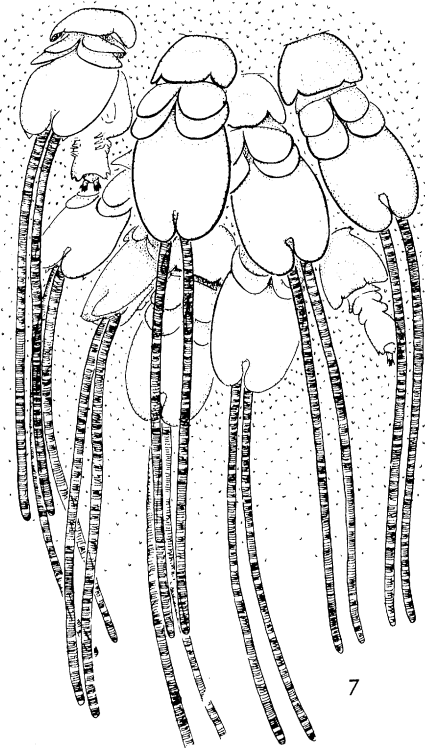
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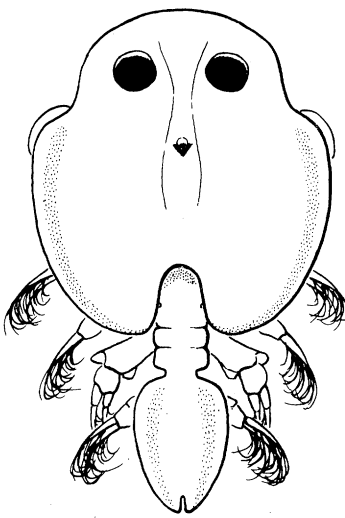
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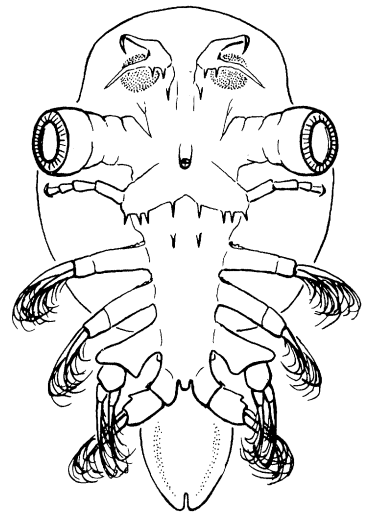
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