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A Preliminary Study of the Effect of Stress on Snails and
Their Larval Trematode Parasites

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Most of the mammals and birds of Jackson Hole harbor trematode parasites. The usual intermediate host in the life cycle of these flukes is a snail. My work during the past few years has dealt with stress on vertebrate hosts and its effect on their parasites. During the summer of 1971 I turned my attention to the invertebrate hosts of trematodes in a preliminary effort to determine if stress on these snails would be reflected in a change in the numbers of their larval fluke parasites. The work was done in the southern end of Grand Teton National Park.

Method

One hundred aquatic snails were placed in a plastic screen cage in the same location of a pond where they were found. Another one hundred snails, in a similar cage, were placed in a nearby area in the same pond but where there were no snails. Apparently a more rapid flow of water in this area was the major factor in discouraging snail establishment. Snails were examined and parasites counted every two weeks from each enclosure and from the surrounding natural pond habitat. At the end of seven weeks all remaining snails in the enclosures were examined and compared to those in the natural habitat.

Results

During the 7-week period the snails in the swifter water maintained the highest number of parasites but the snails rapidly died. By the end of the seven weeks all but two had disappeared. Thirty-five snails remained in the other enclosure. These were compared with thirty-five snails (controls) just outside the enclosure. Thirteen of the enclosed snails were negative compared to twenty-three of the controls. The numbers of larval flukes in each snail were given a numerical value based on a scale designation of 0, +, ++, +++ for no infection, light infection, medium infection and heavy infection. The enclosed snails possessed larger numbers of parasites. Presumably the stress of confinement was the major factor involved. A single classification analysis of variance showed a probability of less than 2.5% that the difference in infection between the two groups was due to chance. This highly significant figure is encouraging but the experiment must be repeated with larger numbers of snails, a record kept of the weight of each snail, and some refinements in techniques.