

Microbial Studies of a High Alpine Water Supply
Used for Recreation
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Objectives of the Research

- A. To determine the bacterial flora of a high alpine water supply seldom visited by man.
- B. To evaluate the impact of various recreational activities on the bacterial flora of a high alpine water supply.
- C. To provide a basis, relative to water quality, for decision making on use of high alpine areas in Grand Teton National Park.
- D. To study the types and occurrence of coliform bacteria and streptococci found in alpine ecology.
- E. To relate the findings from the alpine ecosystem to data obtained at lower elevations.

Research Plan

Water samples were obtained from specified sample sites within Grand Teton National Park at regular intervals and their bacterial microflora determined. Samples were collected at locations along Leigh Creek (an area seldom visited by man), along Cascade Creek (a heavily used area), and the lakes into which these creeks drain. The microflora of public health significance (coliforms and fecal streptococci) were enumerated by standard methods. Colonies of both types of bacteria were transferred to storage media and at the time of this writing were undergoing further differential tests to determine if the organisms were of fecal origin.

Results

The results of the routine enumeration of both coliforms and streptococci that was carried out five times during the months of July and August showed no evidence of gross contamination of the waters under investigation. In fact, the data from Leigh Creek showed greater numbers of both types of bacteria than did Cascade Creek. This finding is interpreted as indicating that human use has not led to the contamination of Cascade Creek. This conclusion is further supported by the confirmatory tests which are being done on the isolated colonies. These data indicate that significantly more of the coliform bacteria that were isolated from the water of Leigh Creek

are of fecal origin. It is also noteworthy that less than 20% of the coliforms in both creeks are of fecal origin.

Conclusions

The recreational activities carried out in Cascade Canyon have negligible harmful effect from the public health standpoint, on the water in that drainage. The finding that there is a lower coliform and streptococcus population in Cascade Canyon indicates that human visitation discourages some animals from residing in that area and by so doing, eliminates some of the fecal contamination that is found in the more natural ecosystem. This finding has also been observed in more complex ecosystems by others. The identity of the Streptococci found in the water is identical with the population found in moose and large rodent fecal material. This population is very different from that found in human feces, and so this finding further supports the conclusion that human contamination is minimal in park waters.

Further conclusions that relate to the various types of coliform and streptococci found in the alpine environment and the effect of man on this population await data that are not available at this time.

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