

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 the 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 the alpine ecology.
- E. To relate the findings from the alpine ecosystem to data obtained at lower elevations.

Research Plan

Water samples were obtained from specific sites within Grand Teton National Park at regular intervals and their bacterial microflora determined. These samples were collected along Leigh Creek and Glacier Gulch (areas seldom visited by man), along Cascade Creek and Garnet Creek (heavily used by man) and the lakes in the valley into which they flow. The bacterial microflora of public health significance (coliforms and fecal streptococci) were determined by standard methods. Colonies of both types of bacteria were transferred to storage media and further characterized at a later time. At the time of this writing, this process is not complete.

Results

The results of this year's study, like last year's in Leigh and Cascade Canyons show no evidence of gross contamination. The bacteria that were found in the waters of these two drainages reflect an impact of man's presence in that there was somewhat better quality water, from microbiological standards, in the drainage that was heavily used by man (Cascade Canyon and Garnet Canyon). This conclusion was supported by the finding that the streptococci that were isolated from Leigh and Cascade Creeks last year were characteristic of the types found in the droppings from the natural animal population and not of man. Therefore, little evidence of

human contamination in either creek was found. Also, there was probably a reduced natural animal population present to contaminate the water in the area heavily used by man.

The samples that were analyzed from Garnet Canyon reflect a similar pattern as observed in Cascade Canyon. Little evidence of gross contamination was found in spite of the intense use and virtual absence of sanitary facilities or topsoil that could be used to bury human waste. On the other hand, consistently high counts of indicator bacteria were isolated from the creek that drains Glacier Gulch. This result was unexpected and is still under investigation. However, at present it appears that the heavy concentration of glacial milk in that stream promotes the growth of a plant community on the rocks in the water that makes a suitable environment for the growth of certain types of the indicator bacteria.

Water samples taken below the outflow of Jenny Lake demonstrate a dramatic human impact. As the water leaves the lake it is of very high microbiological quality and directly below the horse corral (about 600 yards downstream) the count of indicator bacteria increased by a factor of 10 to 20. That this finding can be attributed to the horses rather than the two out-houses that are also located there awaits final characterization of representative bacteria that were isolated there. Confirmation of most of the tentative conclusions mentioned above also requires these data that are not available at this time.

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