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## Notes on Two Amphipods from Areas of Alberta-British Columbia, Canada

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## Notes on Two Amphipods from Areas of Alberta-British Columbia, Canada

by

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and

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*Abstract.* This paper is based upon a report entitled "A report on observations on the biology of certain amphipods (Class Crustacea) in Banff, Jasper, Yoho & Kootenay National Parks and environs in Alberta-British Columbia, Canada" sent to The Director, National Parks Branch, Department of Northern Affairs and National Resources, Ottawa, Ontario, Canada in January, 1969. The study relates specifically to the biology of *Hyalella azteca* Sauss. and *Gammarus lacustris lacustris* Sars. Each collection area has been photographed for its characteristic breeding area. Data on the breeding area as well as data on the pH, dissolved oxygen, total hardness and other aspects on the biology of these amphipods is discussed. Specific acknowledgement for identifications of these specimens by the staff, Natural History Branch, National Museum of Canada, Ottawa, Ontario, Canada is cited.

This paper has been prepared, in part, from certain data noted in a report entitled "A REPORT ON OBSERVATIONS ON THE BIOLOGY OF CERTAIN AMPHIPODS (CLASS CRUSTACEA) IN BANFF, JASPER, YOHO AND KOOTENAY NATIONAL PARKS AND ENVIRONS IN ALBERTA-BRITISH COLUMBIA, CANADA" by Persis C. Coleman and Richard W. Coleman, sent to The Director, National Parks Branch, Department of Northern Affairs and National Resources, Ottawa, Ontario, Canada in January, 1969. This investigation was a part of a general invertebrate survey made in 1964 in certain western Canadian national parks.

Localities for the organisms that were collected by white enamelled dipper or by sieve were cited in the report. From an ecological point of view it is necessary to note where amphipods were not found for future ecological interpretations. In this report Part II gives the specific localities where amphipods were collected. Other collections in Part I that were not noted in Part II of this report did not show any of these amphipods.

This study involves data on the biology of *Hyalella azteca* (Saussure) and *Gammarus lacustris lacustris* Sars, two amphipods that were found in the 1964 general invertebrate survey of certain areas of Banff, Jasper, Yoho and Kootenay National Parks and environs in Alberta-British Columbia, Canada.

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Amphipods in the Class Crustacea are commonly known as scuds. *Hyalella azteca* has been reported from a wide distributional range in the Western Hemisphere; from as far north as Alaska and Canada to as far south as the Falkland Islands (Bovee, 1969; Johnson, 1960 and Bousfield, 1958). Members of the genus *Hyalella* have been seen from such environmental extremes as from areas near water to aquatic areas ranging from salt water on the Ensenada beach in Baja, California, Mexico to streams and impounded bodies of fresh water (MacGinitie & MacGinitie, 1968; Storer & Usinger, 1963 and Pratt, 1935). Specifically *Hyalella azteca* has been reported from a wide range of habitats from saline lakes, brackish and alkaline waters, estuaries, limestone sinks, sloughs, fresh water streams, springs, spring brooks, lakes, ponds, pools, ditches and grass marshes (Eddy in Frey, 1966; Cole in Frey, 1966; Shelford, 1963; Reid, 1961; Bousfield, 1958; Bousfield, 1956 and Pennak, 1953).

Members of the genus *Gammarus* likewise have been reported from such extremes as from marine and estuarine areas to acid mine waters, hard waters of rivers, highly mineralized waters of a sulfato-chloride nature to shores of lakes or ponds, vegetated spring runs and in drifts of leaves pushed by the force of stream currents on snags of tree roots, as well as from caves (Hynes, 1966; Gerking in Frey, 1966; Cole in Frey, 1966; Reid, 1961; Odum & Odum, 1959; Hesse, Allee & Schmidt, 1937 and Needham & Lloyd, 1916). *Gammarus lacustris lacustris* G. O. Sars appears to be distributed in both the Eastern and Western Hemisphere, from as far north as the Baffin Islands, Scandinavia and Siberia to as far south as from the south-western United States. It has been reported from lakes, tundra ponds, sloughs and their outflows to silty waters (Zhadin & Gerd, 1963; Green, 1961; Bousfield, 1958; Stephensen, 1940 and Sars, 1895).

#### METHODS AND MATERIALS USED

Qualitative analyses of each of the breeding areas of these amphipods were based upon written descriptions accompanied with a series of photographs of the breeding areas. Environmental factors reported in this paper for each of these breeding areas include pH, total hardness and dissolved oxygen tests of the Hach Company of Ames, Iowa. Out of 105 collections of organisms made during the survey of this area, only 12 collections were found to be positive for either one or both of these amphipods. Specimens from this survey were collected with a white enamelled dipper or with a sieve.

The reader may examine the original government report of this work for the specific localities of each collection (Coleman &

Coleman, 1969). A table has been prepared for the 12 positive collections.

| Collection Number                                 | pH   | #Total Hardness | D.O. | Thigmotaxis | Phototropism | Colln. Data              |
|---|------|-----------------|------|-------------|--------------|--------------------------|
| #7: <i>H. azteca</i><br><i>G. l. lacustris</i>    | 8.0  | 10              | 9.2  | +           | —            | a,ld                     |
| #12: <i>H. azteca</i> *<br><i>G. l. lacustris</i> | t.d. | t.d.            | t.d. | +           | —            | a,su                     |
| #19: <i>H. azteca</i>                             | 8.0  | 9               | 7.8  | +           | —            | a,su,r,<br>mu,dod        |
| #21: <i>H. azteca</i> *                           | 7.8  | 6               | 8.0  | +           | —            | a,su,r,<br>sa,gr         |
| #32: <i>H. azteca</i>                             | 8.0  | 5               | 6.6  | +           | —            | a,3d                     |
| #34: <i>H. azteca</i>                             | 8.2  | 7               | 7.6  | +           | —            | a,su                     |
| #46: <i>H. azteca</i> *                           | 8.5  | 15              | 8.0  | +           | —            | a,su,<br>sa,r            |
| #50: <i>H. azteca</i>                             | 8.2  | 8               | 9.0  | +           | —            | a,su,<br>sa,r            |
| #60: <i>H. azteca</i>                             | 7.8  | 14              | 7.0  | +           | —            | a,6d,r,<br>sa,su         |
| #65: <i>H. azteca</i> *                           | 8.0  | 7               | 8.6  | +           | —            | a,su,r,<br>3d,mu,<br>dv  |
| #96: <i>H. azteca</i> *<br><i>G. l. lacustris</i> | 9.25 | 14              | t.d. | +           | —            | a,su,ld,<br>sac          |
| #98: <i>H. azteca</i> *<br><i>G. l. lacustris</i> | 8.0  | 10              | 9.2  | +           | —            | a,su,9d,<br>r,dod,<br>dv |

LEGEND: a=near edge of lake                      su=collection from surface  
 d=collection in inches below surface of water (ie.ld=1 inch)  
 dv=decomposed vegetation                      dod=decomposed organic debris  
 sac=grey sandy clay oozy bottom  
 sa=sandy bottom                                      r=small to large rocks  
 gr=gravel    mu=mud bottom  
 t.d.=Technical difficulties prevented test  
 D.O.=Dissolved oxygen expressed in parts per million  
 #=Total hardness expressed in grains per gallon  
 \*=Pictures of breeding areas found in this paper

Specific acknowledgement for determinations of these specimens made by members of the staff of the National Museum of Canada, Ottawa, Ontario, Canada is cited.

In conclusion it may be stated that these amphipods from this area of western Canada appeared to occur generally in slightly alkaline waters that may be grouped in the hard-water group. The beds of the breeding areas showed considerable variability. Beds varied from those with oozy clay bottoms to those covered with organic debris, as well as sandy bottoms to bottoms covered with varying sizes of rocks. The water was clear and pure. Breeding

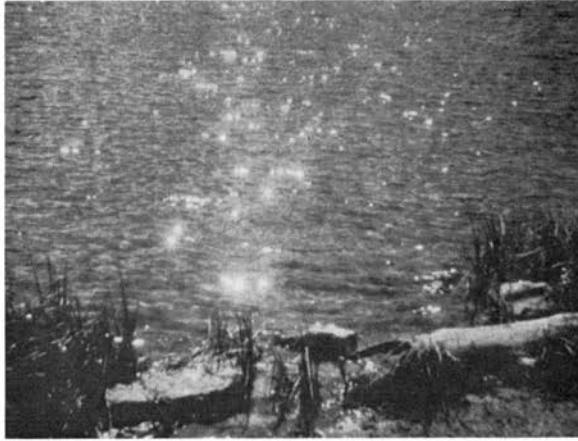


Figure No. 1: Breeding area for collection #98

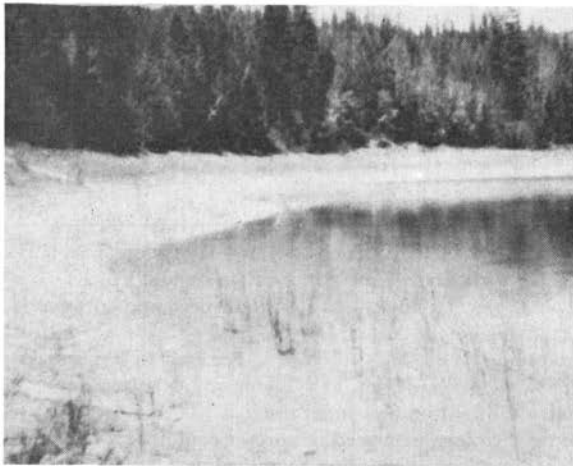


Figure No. 2: Breeding area for collection #96

areas were especially associated with shore margins. In breeding areas having beds of organic debris, the amphipods tended to congregate under the shelter of decomposed vegetation. If organic debris was not present and the bed was mucky, the amphipods would tend to scurry in the muck on the approach of the collector. If the bed of the aquatic breeding area varied from sand to from small to large rocks, the amphipods would tend to be found close to shore near or at the marginal vegetation. Amphipods from these collections were primarily collected from the surface of the water about 10 inches in depth. The amphipods were markedly thymo-



Figure No. 3: Breeding area for collection #12



Figure No. 4: Breeding area for collection #65

tactic, being sensitive to even vibrations of the water in the process of dipping for these organisms. These amphipods tended to exhibit negative phototropism, especially tending to scurry under organic debris, rocks and other areas of shelter.

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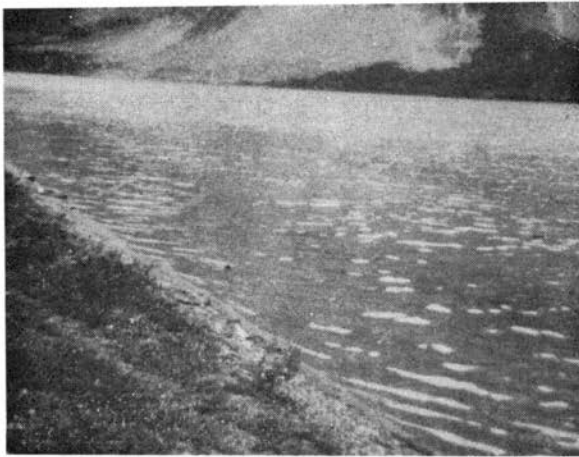


Figure No. 5: Breeding area for collection #21



Figure No. 6: Breeding area for collection #46

The Biology Of Certain Amphipods (Class Crustacea) In Banff, Jasper, Yoho & Kootenay National Parks and Environs In Alberta-British Columbia, Canada. Director, National Parks Branch, Department of Northern Affairs and National Resources, Ottawa, Ontario, Canada.

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