STATUS OF THE RICHARDSON VOLE (Microtus richardsoni) IN CANADA¹

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RICHARDSON VOLE of the west is the largest of the genus in Canada. It is approached in size only by the very different M. xanthognathus (Yellow-cheeked Vole). M. richardsoni is characterized by its large size; fairly long tail (for a Microtus); large feet; large, angular skull with spreading zygomatic arches; small audital bullae; and projecting incisors. Adult males have conspicuous side glands and several adult females in the collection of the National Museum of Canada also have the presence of side glands recorded on the labels. There is said to be a musk-bearing anal gland. Miller, 1896, North Amer. Fauna. No. 12, pp. 66f, considers this species as belonging to the subgenus Arvicola or Water Voles that is better represented in the old world than the new, where richardsoni is the only species. Bailey (1900, North Amer. Fauna, No. 17, p. 59) in his review of the genus followed this arrangement. But Ellerman, (1941, The Families and Genera of Living Rodents, p. 927), raises Arvicola to generic status to include only some thirty-three old world forms, placing richardsoni in Microtus where it ap-pears to have no very close relatives.

In Canada the Richardson Vole occurs in the southern Rockies west to the Cascades where it lives about mountain streams, in forests and meadows, making burrows and runways. Their numbers may fluctuate violently and they can sometimes be extremely abundant (Racey and Cowan, 1936, Prov. B.C. Report Prov. Museum for 1935, p. 27). We have three pregnant females taken in July and August, with 7, 7, and 8 embryos. One of these had recently been nursing, indicating that broods may follow each other in rapid succession. Crowe (1943, Bull. Amer. Mus. Nat. Hist., 80, p. 405) records a July immature carrying 4 embryos, indicating that this species breeds of an early age, as with M: pennsylvanicus, and that younger animals have smaller litters. Half-grown young in the collection taken in June and July indicate that breeding starts early.

Three subspecies of *richardsoni* must be considered in connection with Canadian popula-

1. -- Received for publication April 20, 1943.

tions: richardsoni DeKay from near Jasper House, Alta.; macropus Merriam from Pahsimeroi Mts., Idaho; and arvicoloides Rhoads from Lake Keechelus, Kittitas Co., Washington.

The form *arvicoloides* has been recorded from southwest British Columbia to Alta Lake (Racey and Cowan, l.c.) and specimens from the southern Canadian Rockies have been recorded as approaching *macropus* (Crowe, *l.c.*). Bailey (op. cit. p. 60) gave the range of *richardsoni* as restricted to the vicinity of Jasper and Henry House.

The National Museum of Canada has a good representation of this species from various parts of its range in Canada, including adults from Jasper Park, 5; Waterton Lake Park, 6; Rossland, 8; Hope-Princeton summit, 2; Lihumption Park, 1; Mt. Cheam, 1; McGillivray Creek, 2.

Comparing the various specimens with the Jasper Park specimens (virtually topotypes) we cannot see any significant differences. The color difference between the series are less than differences within series, and there are no average differences.

The following are average measurements:

	Total Length	Tail	Hind foot	Basal length of skull	Zygomatic breadth of skull
Jasper	248.8mm.	74.2	27.9	33.1	21.8
Waterton Lake	238.2	66.3	27.8	33.2	21.6
Rossland	238,6	75.9	27.9	33.4	21.2
Hope-Princeton					
Summit	244	79	26.	34.1	21.8
Lihumption	248	78	30	34.25	22.5
Mt. Cheam				34.5	21.75
McGillivray Cr	259.5	79.5	28	34	22.25

The race macropus is smaller; Davis (1939, The Recent Mammals of Idaho, p. 322, gives measurements as 215-67-27 mm., and states that extremely large individuals may measure 220-70-29.

Various skull and teeth characters are given as separating *richardsoni* from *macropus* and *arvicoloides*, which last two are similar in skull characters. None of our speci-

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mens differ appreciably in skull and teeth characters. It is worthy of note that some of our Jasper Park specimens have the characters given for macropus - arvicoloides to distinguish them from richardsoni; two of the four Jasper skulls have the posterior loop of the third upper molar recurved, one has the incisive foramen constricted posteriorily. In supraoccipital ridging, characters of nasals, and bullae there are no distinctive differences; in the projection of the incisors the Jasper Park specimens may average slightly more projection, but it is very slight. The conclusion is that all our Canadian specimens must be referred to *Microtus richardsoni richardsoni* (DeKay). In Canada it ranges at high altitudes in Alberta and British Columbia from Waterton Lakes National Park west to the mountains above Chilliwack and north at least to Alta Lake in the Coast Range and Jasper National Park in the Rocky Mountains.

The above must not be construed as an opinion on the validity of either *macropus* or *arvicoloides*, of which we have seen no topo-typical material.

NOTES AND OBSERVATIONS

AN APPARENTLY UNRECORDED FOOD OF THE RED SQUIRREL. — In winter in the Ottawa Valley, and doubtless elsewhere, the snow under white cedars (Thuja occidentalis i.) is often seen to be strewn with the tips of the tree's branches. These have been bitten off by red squirrels, (Sciurus hudsonicus) and their reason for doing so is at first glance not very clear. But close examination reveals that the squirrels have been eating the extremely small winter buds of the staminate flowers which are enclosed between the terminal pairs of the scale-like leaves. These buds form in the late autumn and pass the winter as minute black ovoid bodies, scarcely one millimeter in longest diameter. They resume growth so early in the spring that the flowers sometimes open and shed their pollen before the snow is all gone. In feeding on the buds, the squirrel nips off a spray, delicately bites out the tiny black buds without lacerating the enclosing leaves, and drops the spray to the ground. The varying hare eats cedar leaves, but evidently the red squirrel does not like them, and it is remarkable how neatly he removes the minute flower bud without biting into the surrounding foliage.

EARLY ARRIVAL OF BRANT ON THE NORTH SHORE OF THE GULF OF ST. LAWRENCE — Mr. Georges Maloney, of Mingan, Saguenay County, Quebec, who is employed by the Department of Mines and Resources as Caretaker of Birch Islands Bird Sanctuary, which is situated about three miles south of Mingan, reports that on April 29, 1943, he saw This seems to be an unrecorded food of the red squirrel. Klugh (Ecology of the Red Squirrel, Jour. Mammal. 8: 1, 1927) says the seeds of the white cedar are extensively eaten by squirrels; and Hatt, (The Red Squirrel, Roosevelt Wild Life Annals, 2: 1b, 1929) speaks of squirrels cutting off clusters of cedar cones for the seeds. But neither author mentions the flower buds in his list of squirrel foods; nor have I been able to find the buds recorded elsewhere as eaten by squirrels.

Cedars are so thickly leaved that the branchlets cut off by the squirrels, though otten in considerable number, do not seem to harm the trees. If it were not for the litter on the ground, no one would know that the tree had lost any foliage. However, R. E. Balch, in The Forestry Chronicle (18: 1, March, 1942) describes damage to balsam fir and spruce in the maritime provinces by red squirrels cutting off shoots to feed on flower buds and foliage. As far as my observation goes, Ottawa Valley squirrels do not eat spruce or balsam flower buds. I have never noticed here shoots dropped by squirrels from trees of these species. -CHARLES MAC-NAMARA, Arnprior, Ontario.

14 White-bellied Brant (Branta bernicla hrota) in the sanctuary. I know of no previous record of the arrival of this species on the north shore of the Gulf of St. Lawrence in April. The spring of 1943 was unusually cold and late at Mingan, as in northeastern North America generally.

- HARRISON F. LEWIS, Department of Mines and Resources, Ottawa.



Anderson, Rudolph Martin and Rand, Austin Loomer. 1943. "Status of Richardson Vole (Microtus richardsoni) in Canada." *The Canadian field-naturalist* 57(6), 106–107. <u>https://doi.org/10.5962/p.340657</u>.

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