

THE LAND SHELLS OF VANCOUVER ISLAND.

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Very little attention seems to have been given by conchologists to the land and fresh water shells of the extreme western portion of the Dominion. Many very full lists of eastern Canadian shells, and others more or less complete, of the mollusca of the prairie provinces, have been published; but, so far as I know, only one person (Mr. J. K. Lord) has attempted to enumerate the land shells of our Pacific coast, and his list, published in "The Naturalist in Vancouver Island," 1866, is very incomplete, containing the names of seven species only.

My own collecting in Vancouver Island, although it has extended over a period of seven years, has not been by any means exhaustive. In fact I have only examined four localities, and these comparatively near together, and all on the east coast of the island:—

1. Victoria, at the south-eastern extremity of the island;
2. Saanich, twenty miles north of Victoria;
3. Salt Spring Island, a small island about a mile from the coast of Vancouver Island and a little to the north of Saanich;
4. Comox, a settlement about 140 miles north of Victoria, but also on the east coast of Vancouver Island.

In these four localities, however, I have succeeded in finding thirty species of terrestrial mollusca, which form the subject of the present paper, and twenty-six species of fresh water shells, which I propose to enumerate in a subsequent contribution to this journal.

The list of Vancouver Island land shells that here follows contains the names of thirty-two species; thirty of these, as above stated, have been taken by myself. Of the other two, one, *Onchidella Carpenteri*, W.G.B., is added on the authority of Dr. W. G. Binney, and might probably have been found by me had my search been more thorough. The other, *Arionta Dupetithouarsi*, is recorded from Vancouver Island by J. K. Lord, but my own impression is that the shell was collected in California and accidentally mixed with the Vancouver collection, as no trace of this species has been discovered on the island by anyone

else. Mr. Lord also took home to England a specimen of *Orthalicus zebra*, a Central American shell which he said he had taken alive on Vancouver Island. I have seen the specimen itself in the British Museum, but I cannot think that the species is indigenous on Vancouver Island.

LAND SHELLS OF VANCOUVER ISLAND.

1. *Selenites Vancouverensis*, Lea, sp.
2. " *sportella*, Gould, sp.
3. *Limax agrestis*, Linn.
4. " *hyperboreus*, Westerlund.
5. *Hyalina arborea*, Say, sp.
6. " *miliun*, Morse, sp.
7. " *Binneyana*, Morse.
8. " *conspecta*, Bland, sp.
9. *Conulus fulvus*, Müller, sp.
10. *Vitrina Pfeifferi*, Newcomb.
11. *Patula striatella*, Anthony, sp.
12. " *asteriscus*, Morse, sp.
13. *Microphysa Lansingi*, Bland, sp.
14. " *Stearnsii*, Bland, sp.
15. " *minutissima*, Lea, sp.
16. *Ariolimax Columbianus*, Gould, sp.
17. *Prophysaon Hemphilli*, Bland and Binney.
18. *Stenotrema germanum*, Gould, sp.
19. *Mesodon Columbianus*, Lea, sp.
20. " *devius*, Gould, sp.
21. *Aglaja fidelis*, Gray, sp.
22. *Arionta Dupetithouarsi*, Deshayes, sp.
23. *Pupilla corpulenta*, Morse, sp.

24. *Vertigo ovata*, Say.
25. " *simplex*, Gould, sp.
26. *Ferussacia subcylindrica*, Linn. sp.
27. *Succinea rusticana*, Gould.
28. " *Nuttalliana*, Lea.
29. " *Oregonensis*, Lea.
30. *Onchidella Carpenteri*, W. G. Binney.
31. " *borealis*, Dall.
32. *Carychium exiguum*, Say, sp.

In the foregoing list several species will be recognized as common European forms, namely, *Limax agrestis*, *Conulus fulvus*, *Ferussacia subcylindrica*, and in the opinion of some conchologists the following American and European species are also identical :—

AMERICAN.		EUROPEAN.
<i>Microphysa minutissima</i> , Lea,	=	<i>pygmœa</i> , Drap.
<i>Vertigo ovata</i> , Say,	=	<i>antivertigo</i> , Drap.
" <i>simplex</i> , Say,	=	<i>edentula</i> , Drap.
<i>Carychium exiguum</i> , Say,	=	<i>minimum</i> , Müll.

As, however, there is a little uncertainty on these points, I prefer for the present to use the earliest American names.

The seven species just mentioned occur also in the eastern parts of Canada, and with the five following find a place in the Ottawa lists : *Hyalina arborea*, *Hyalina milium*, *Hyalina Binneyana*, *Patula striatella*, *Patula asteriscus*. There are thus twelve species out of thirty-two common to Ottawa and Vancouver Island. The remaining twenty species are all purely western forms, with the single exception of *Pupilla corpulenta*, which is recorded from Nevada and Colorado.

NOTES.

1. SELENITES VANCOUVERENSIS, Lea, sp.

Helix Vancouverensis, Lea. Am. Phil. Trans., VI, 87, pl. xxiii, f. 72 (1839) = *H. vellicata*, Forbes.

Common and distributed over the whole island. When fully adult the peristome is sometimes almost as much depressed above as in *sportella*.

2. SELENITES SPORTELLA, Gould, sp.

Helix sportella, Gould, Proc. Bost. Soc. Nat. Hist., ii, 167. (1846)

Occurring with the last species at Saanich, Comox and Salt Spring Island, but absent from the district round Victoria. As regards its shell it seems abundantly distinct from *Vancouverensis*; at any rate it is a well marked form, and as such deserves a name. It differs from the last species in being constantly smaller and more strongly striated, and in having a much more open umbilicus. The dimensions of this species and of *S. Voyana*, as given in Binney's Manual, seem to be incorrectly printed.

3. LIMAX AGRESTIS, Linné, Syst. Nat. ed. x, I, 652 (1758).

Introduced, I suppose from Europe, a few years ago, and now a great pest in the Victorian gardens. It has not yet spread far into the country districts, but no doubt such extension is only a matter of time.

4. LIMAX HYPERBOREUS, Westerlund.

I collected some small blackish slugs at Comox in May, 1887, of which I sent some specimens to Dr. W. G. Binney. He referred them doubtfully to this species. In his "Second Supplement to the 5th volume of the Air-breathing Mollusks of the United States," p. 42, Dr. Binney mentions the receipt of a *Limax* from Seattle, Washington Territory, similar to *hyperboreus* in outward appearance and in the dentition.

5. *HYALINA ARBOREA*, Say, sp.

Helix arborea, Say, Mich. Encyc., pl. iv, fig. 4. (1816).

Very common everywhere. Cannot be distinguished from eastern specimens.

6. *HYALINA MILIUM*, Morse, sp.

Helix milium, Morse, Proc. Bost. Soc. VII, 28, (1859).

Not rare among fallen leaves and moss.

7. *HYALINA BINNEYANA*, Morse, Journ. Portl. N. H. Soc., I, 13, fig. 25, 26 ; and pl. ii, fig. 9 ; pl. vi, fig. 27. (1864).

Not common. I am not very confident that this is the true *Binneyana*. Specimens collected by me have been seen by Dr. Binney, who considered them to be *H. viridula*, and has so recorded them in Bull. Mus. Comp. Zool. Cambridge, vol. XIII, p. 42. Dr. Dall, however, named other specimens from the same lot *Binneyana* after comparison with typical specimens in the Smithsonian collection. My shells are very different in colour to those I have always received as *viridula*, and neither do they agree exactly with Binney's figure of *Binneyana*, though they are more like the shells that receive the latter name in Ottawa collections. It is just possible that the Vancouver shells may belong to a distinct species.

8. *HYALINA CONSPECTA*, Bland, sp.

Helix conspecta, Bland, Ann. N. Y. Lyc, VII, 163, fig. 7. (Nov. 1865).

Alaska to California. Next to *striatella* and *arborea* this is the commonest of the smaller land shells in Vancouver Island. It occurs everywhere under logs and stones and among decaying leaves.

9. *CONULUS FULVUS*, Müller, sp.

Helix fulva, Müll. Verm. Hist., pt. II, p. 56. (1774) = *H. chersina*, Say, + *H. egena*, Say.

Circumpolar. Common. The specimens I have collected in Vancouver Island are the finest I have seen; larger than any I have taken in England or in Eastern Canada.

10. VITRINA PFEIFFERI, Newcomb, Proc. Cal. Acad. Nat. Sci., II, 92. (1861)

Not common, but widely distributed. Occurs usually under stones. I have never found it in colonies like *limpida*.

11. PATULA STRIATELLA, Anthony, sp.

Helix striatella, Anth. Bost. Jour. Nat. Hist., III, 278, pl. iii, f. 2. (1840)

Very common.

12. PATULA ASTERISCUS, Morse, sp.

Helix asteriscus, Morse Proc. Bost. Soc. Nat. Hist., VI, 128. (1857).

Not rare at Comox, May 1887, among fallen and decaying leaves. I have not found it elsewhere on Vancouver Island. Occurs also in eastern parts of America.

13. MICROPHYSA LANSINGI, Bland, sp.

Zonites Lansingi, Bland, Ann. Lyc. N. H. of N. Y., XI, 74, fig. 1, 2. (1875).

Described from Astoria in Oregon. It is not uncommon in Vancouver Island, and I have found it in all the localities I have examined. At Comox and Salt Spring Island, however, the next species is the more plentiful.

14. MICROPHYSA STEARNSI, Bland, sp.

Zonites Stearnsi, Bland, Ann. Lyc. N. H. of N. Y., XI, 76, fig. 3. (1875)

This rare shell can easily be distinguished from *Lansingi* by its larger size, darker color, and the absence of the lamella on the peristome. I have only found it at Comox and

Salt Spring Island, where it occurs not uncommonly with *Lansingi* under leaves and under pieces of maple bark in the woods. This species was first found in Oregon and Washington Territory.

15. MICROPHYSA MINUTISSIMA, Lea, sp.

Helix Minutissima, Lea, Trans. Am. Phil. Soc. IX, 17. (1841)

? = *Helix pygmæa*, Drap. Tab. Moll. p. 93. (1801)

Common under dead leaves in woods. There seems still to be a doubt as to the identity of this species with the European *H. pygmæa*, Drap. My Vancouver Island specimens do not appear to me to agree well with those I have collected in England.

16. ARIOLIMAX COLUMBIANUS, Gould, sp.

Limax Columbianus, Gould, in Terr. Moll., II, 43, pl. lxvi, fig. 1. (1851).

Pacific Coast, British Columbia, to California. Common, growing to a very large size. Around Victoria the specimens are generally spotted and blotched with black, but at Comox the unicolorous variety is more common. The eggs of this species, which are as large as good sized peas, are often found under logs or bark during the winter.

17. PROPHYSAON HEMPHILLI, Bland and Binney, Ann. Lyc. N. H. of N. Y., X, 293, pl. xiii, fig. 8. (1873)

The commonest slug in Vancouver Island and recognized at once by the two blackish lines that border the mantle. It may be found under logs and stones and among leaves all over the island. It also occurs in Oregon and California.

18. STENOTREMA GERMANUM, Gould, sp.

Helix germana, Gould, U. S. Expl. Exped. Moll., (1852), p. 70, fig. 40, a, b, c.

Not common, but occurring in all the localities I have searched. It is a much smaller shell than the next species, and is of a richer chestnut color. Specimens usually occur singly, and I have never found more than two under the same log. *Columbianus*, on the contrary, is generally in colonies. *Germanum* seems to be a species of limited range, the only locality named in "Binney's Manual" being Astoria, in Oregon.

19. MESODON COLUMBIANUS, Lea, Sp.

Helix Columbiana, Lea, Am. Phil. Soc. Trans., VI, 89, pl. xxxiii. fig. 75.

= *H. labiosa*, Gould.

Abundant among leaves and under logs. Occasionally specimens occur with an indication of a parietal tooth. I have twice taken specimens with the shell of a grayish white colour. Occurs from Sitka to California.

20. MESODON DEVIUS, Gould, sp.

Helix devia, Gould, Proc. Bost. Soc. N. H., II, 165. (1846)

I have only seen one specimen of this species from Vancouver Island, and that was taken at Esquimalt, near Victoria. The specimen was sent to Dr. W. G. Binney, who agreed in the identification. *Devius* is not uncommon in Oregon, and was therefore to be expected in Vancouver Island.

21. AGLAJA FIDELIS, Gray, sp.

Helix fidelis, Gray, Proc. Zool. Soc., July, 1834, 67.

= *H. Nuttalliana*, Lea.

Common in woods. The shell sometimes nearly black, occasionally very pale greenish white and almost transparent. This species roams abroad in wet weather in the spring and autumn after the manner of the European *Helices*.

22. ARIONTA DUPETITHOUARSI, Deshayes, sp.

Helix Dupetithouarsi, Desh. Rev. Zool., 1839, 360.

= *H. Oregonensis*, Lea.

This species is entered here simply on the strength of the record by Lord mentioned above. I have not myself seen in Vancouver Island any trace of this shell, or indeed of any other *Arionta*. *Arionta Townsendiana*, Lea, sp., is, however, common on the mainland of British Columbia, but has not as yet turned up on the island. *Dupetithouarsi* is a native of Monterey, California, and a few other places in the same region.

23. PUPILLA CORPULENTA, Morse, sp.

Isthmia corpulenta, Morse, Ann. N. Y. Lyc., VIII, 210, fig. 7 (Nov. 1865).

Not rare in moss and among leaves. Also found in company with *Vertigo simplex*, as described below. This is a species that was hardly to be expected in Vancouver Island, its headquarters being in Nevada and Colorado, but I believe my specimens are correctly determined.

24. VERTIGO OVATA, Say, Journ. Acad. Nat. Sci. Phil., II, 375. (1822).

+ *Pupa modesta*, Say.

= *V. tridentata*, Wolf.

Only taken in one locality near Victoria. This was on the margin of a swamp (since drained) about four miles from the city. The specimens were under leaves close to the water's edge. It is an eastern species not before quoted from the Pacific province. Dr. Gwyn Jeffreys considered this species identical with the British *Vertigo antivertigo*, Drap.

25. VERTIGO SIMPLEX, Gould, sp.

Pupa simplex, Gould, Bost. Journ. Nat. Hist., III, 403, pl. iii, fig. 21 (1840).

I have found this species in moss in many localities, but not plentifully. In May, 1887, however, I found it, together with *Papa corpulenta*, in great abundance on the fronds of a fern, *Aspidium munitum*. This was at Comox, but I afterwards found it in the same situation in other localities. The *Aspidium*

grows most luxuriantly in damp places all over the island, and few plants that I have examined at the right season of the year have been without one or more of the Vertigos. This species is referred by Jeffreys to *Vertigo edentula*, Drap., of Europe.

26. FERUSSACIA SUBCYLINDRICA, Linn., sp.

Helix subcylindrica, Linn. Syst. Nat. ed. 12, II, 1248. (1766)

= *lubrica*, Müller.

= *lubricoides*, Stimpson.

= *Morseana*, Doherty.

This widely distributed species occurs, but not very abundantly, in all the localities I have examined, generally under stones or logs, often in very exposed situations.

27. SUCCINEA RUSTICANA, Gould, Proc. Bost. Soc. N. H., II, 187. (Dec. 1846).

The three species of *Succinea* here recorded seem to be distinct, although it is not easy, to my mind, to distinguish between the young specimens. *Rusticana* has only occurred to me at Comox.

28. SUCCINEA NUTTALLIANA, Lea, Proc. Am. Phil. Soc., II, 32. (1841).
Common at Victoria.

29. SUCCINEA OREGONENSIS, Lea, Proc. Am. Phil. Soc., II, 32. (1841).
Common at Victoria. These three Succineas occur throughout the "Pacific province."

30. ONCHIDELLA BOREALIS, Dall, Am. Journ. Conch., VII, 135. (August, 1866).

This species is common near Victoria on rocks close to high water mark, but is very likely to escape notice unless specially sought for. It was found by Dall from Alaska to Vancouver Island.

31. ONCHIDELLA CARPENTERI, W. G. Binney, Proc. Ac. Nat. Sci., Phil., 1860, 154.

Not taken by myself, but said by Binney to occur from Straits of Fuca to Gulf of California. As nearly all the mollusca recorded from the Straits of Fuca have also been found on the Vancouver coasts, it is most probable that this also occurs there. It is much smaller than *O. borealis*, and hence may have escaped my notice.

32. CARYCHIUM EXIGUUM, Say, sp.

Pupa exiqua, Say, Journ. Acad. Nat. Sci., II, 375. (1822).

? = *C. minimum*, Müll. Verm. Hist. pt. II, p. 125. (1774).

Common at Comox and Salt Spring Island, but not observed near Victoria.



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