

Collecting land and freshwater molluscs during a visit to Canada in 2010. Part one: Alberta.

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Samenvatting. In de zomer van 2010 werd er naar weekdieren gezocht in Alberta, Canada. Op 21 plekken werden slakken op 't oog verzameld en op acht van die 21 plaatsen werden ook strooiselmonsters genomen. In totaal werden er 29 soorten land-slakken en 16 soorten zoetwaterslakken verzameld. De meest bijzondere soort die werd verzameld was *Gastrocopta tappaniana* die pas eenmaal eerder uit Alberta was beschreven.

Introduction

For the second time I went with family and friends to Canada. While visiting friends I was able to collect land and freshwater molluscs. My first visit was in 1996 and the results of my collecting at that time were published (Neckheim, 1997). From 23 July to 21 August 2010 again I collected in and near Edmonton and Smoky Lake County (Alberta). In this paper I present the results of collecting and observing land and freshwater molluscs in Alberta. A second paper will address my data on British Columbia.

Materials and methods

Whenever I had the opportunity to collect, I searched in likely places for terrestrial snails and slugs. I also looked for freshwater molluscs but I gave this group of animals less attention. In particular I looked under wood and stones in natural habitats, with the goal of finding small species of snails, like for instance *Vertigo* spec. Snails were collected by handpicking. I collected and made observations at 22 sites; at eight of these sites leaf litter was collected (litter sampling). At one site drift debris and at another site mud was collected. Larger living species like slugs were not collected but were documented through photographs. Because I was not well equipped with material to preserve live animals I did not collect specimens for dissection.

All litter samples were bagged, labelled, and on return home dried at room temperature before being sieved and sorted out. Litter samples were passed through three sieves (0.5 mm, 1 mm and 5 mm mesh). The material passing the 0.5 mm sieve was not kept. All specimens found are in the collection of the author. The data were presented to the Royal British Columbia Museum (Victoria). Where snails were found photos were taken of the molluscs as well of the habitat.

Scientific names for land snails and slugs were used according to Grimm et al. (2009) and names for freshwater molluscs according to Clarke (1981) and Burch (1989).

In Canada the following maps proved to be useful: street map of Edmonton CAA/AMA 1 : 40,000 and Alberta British Columbia, provincial series CAA/AAA 1 : 1,505,000 and Smoky Lake County Ownership Map, April 26, 2010, UTM Zone 12 NAD 83, 1 : 100,000. Via Toporama I added latitude and longitude coordinates for most sites. <http://atlas.nrcan.gc.ca/site/english/maps/topo/map/>

Collecting

The weather in Alberta was warm and sunny; it did not rain much. I saw many ponds that had dried out. This may be regular and some freshwater molluscs are well adapted to survive dry periods, but inhabitants of Smoky Lake told me that this year was extremely dry. I saw the golden colour of thousands of empty shells of mostly *Lymnaea stagnalis* lying on the mud

of dried out ponds. This looked beautiful but no doubt was a disaster for the snails. On the other hand, the year was very good for mosquitoes. While looking for snails, I often went into bushes or other moist places, and immediately mosquitoes found my back and arms and bit through my clothes. Even when covered with lots of insect repellent the mosquitoes made it very hard to stay long enough at those sites to thoroughly investigate them for molluscs.

In Edmonton I stayed in a new suburb in the northeast of the city. In that area gardens were very neat and I found them to be very poor for snails. I also collected near and along Fort Road (also in northeast Edmonton). Because Fort Road is an old road, I presumed the mollusc fauna to be less disturbed compared to gardens in the neighbourhood. When I visited Smoky Lake County in 1996, I collected only at one site and I took only one drift sample at Mons Lake. During this trip, I collected in different habitats. I also searched for snails during a walk along the North Saskatchewan River in Heritage Park. I drove from Edmonton to Vancouver via Calgary and Banff. Near Ghost Lake I collected a small soil sample under rocks during a car stop. I collected at several sites near Banff and near Lake Louise. On the way back from Vancouver to Edmonton I collected near Lundbreck (100 km west of Lethbridge) and again in Edmonton near Fort Road and in addition at Limestone Creek. Below, all collecting sites are listed. Tables 1 and 2 show all sites and species collected therein.

1. Edmonton; Brintnell 42 Street; along lake near Manning Drive; under pebbles. 27-07-2010.
53° 36' 59" N 113° 24' 19" W and 53° 37' 3" N 113° 24' 12" W.
Around this man-made lake, designed to control flooding during heavy rainstorms, I looked on several days for snails and slugs (i.e., also 31-07 and 20-08). Added here are my observations of slugs from gardens on 43 Street, very close to the lake.
2. Edmonton; Hermitage Park; along North Saskatchewan River; under wood. 28-07-2010.
53° 34' 34" N 113° 22' 18" W.
During a visit to this park I walked along bushes and looked under wood. It was very dry and I could find only one empty shell. I did not take litter samples here.
3. Edmonton; Kirkness Fort Road/153 Ave.; along railway; Trembling aspen bush; under wood and in bush. 29-07-2010. 53° 36' 57" N 113° 23' 26" W.
Under wood I found several snails and collected them by handpicking. The next day (i.e., 30-07-2010) I collected a litter sample of leaf litter in the bush.

4. Smoky Lake County; Dubetz property; moist place (spring?) in mixed forest; under moss, ferns and branches, probably calcareous soil or water. 01-08-2010. 54° 10' 33" N 112° 26' 48" W.
5. Smoky Lake County; Dubetz property; near small stream down the hill; Trembling aspen forest; left from the small "bridge". 01-08-2010. 54° 10' 29" N 112° 27' 13" W.
6. Smoky Lake County; Dubetz property; dry Trembling aspen forest; at the right of the farm down the hill. 01-08-2010. 54° 10' 46" N 112° 26' 54" W (fig. 1).



Fig. 1. Creek on Dubetz territory near Smokey Lake. Habitat of *Zonitoides arboreus*, *Vallonia gracilicosta* and *Vertigo gouldii*. Photo: Tello Neckheim.

7. Smoky Lake County; Dubetz property; near small stream down the hill; Trembling aspen forest; right from the small "bridge". 02-08-2010. 54° 10' 30" N 112° 27' 15" W.
8. Smoky Lake County; Hanmore Lake; near parking place and picnic tables, drift along beach. 02-08-2010. 54° 17' 13" N 112° 30' 6" W.
I collected some drift debris along the beach of the lake. Three species of land shells, all of which live in moist habitats except *Vertigo gracilicosta* that lives also in dry habitats, were collected.
9. Between Calgary and Banff (Alberta); near Ghost Lake; along Highway 1a; old rock with herbs, 05-08-2010.
I was able to collect a small litter sample from under rocks. I did not find any snails by handpicking. Nearby, there was a small spring and I could neither find any snails there. In the sample only some old shells were found.
10. Banff National Park; Fenland Trail area; along Mount Norquay Road; in pine forest, under wood. 05-08-2010. 51° 10' 53" N 115° 34' 49" W.
In Fenland Trail area I collected by handpicking and took a litter sample under coniferous trees. *Deroceras reticulatum* was found along the small river.
11. Banff National Park; Fenland Trail area; along the crossing of the railway and Mount Norquay Road in an open, rocky, dry site near the forest; under wood. 05-08-2010. 51° 10' 52" N 115° 34' 47" W.
12. Banff; Under a branch in the "garden" of the hospital in Banff; This garden is also open but with overhead pine trees, passing less sun. 05-08-2010. 51° 10' 46" N 115° 34' 40" W.
13. Banff National Park; in campground Tunnel Mountain (campsite B63); under wood in pine forest. 06-08-2010. 51° 11' 31" N 115° 32' 26" W.
Near our campsite I looked for snails under wood and I collected a litter sample of drift debris formed after rain. In the drift sample no shells were found.
14. Banff National Park: Lake Louise; in pine forest with moss and many herbs; near the lake behind a boat rental. 07-08-2010. 51° 24' 56" N 116° 12' 59" W.
Lake Louise was still beautiful. We were there in 1996 but I did not look for snails then. On this trip I actively searched for snails but it was difficult to find any. I soon found one *Vertigo* species alive but none more. I took a litter sample in the forest and photographed some colourful flowers.
15. Along Highway 3, for about 3 km west of Lundbreck; under wood along the fence with grasslands. 16-08-2010.
We stopped to look at some Bisons on grassland and I searched under wood along the fence.
16. Lundbreck; along Highway 3 near 22 Road; under wood along railway. 16-08-2010. 49°35'16.53"N 114° 9'43.69"W.
Driving out of British Columbia into Alberta we passed Lundbreck and stopped to have a meal. Under wood along the railway several snails and slugs were found. I collected *Pupilla* specimens.
17. Along Road 22; north off Lundbreck; Oldman Creek; near the small river in *Carex* sedges, Latitude and longitude not locatable. 16-08-2010.
Along Road 22 we stopped at a small river with natural vegetation that drew our attention. I took a sample of *Carex* debris and moss from a moist site near the small river.
18. Limestone Creek; between St. Michael and Andrew; East of 855 Road; along a side road from 45 Road near the small bridge; under wood in grass and in mud. 18-08-2010. 53° 53' 39" N 112° 28' 51" W.
Back in Edmonton I collected again, revisiting some sites and looking at new sites for snails. At Limestone Creek I watched for birds and of course looked for land snails and I took a sample of mud for freshwater shells. Two land snail species were found. *Oxyloma* shells were found in the mud sample.



Fig. 2. Horsehill Creek, near Edmonton. Habitat of *Succinea* spec., *Deroceras reticulatum* and *Vitrina pellucida*.
Photo: Tello Neckheim.

19. Edmonton; along Fort Road near creek; under paper in grass. 19-08-2010. 53° 38' 54" N 113° 21' 28" W (fig. 2).
20. Edmonton; Gorman Industrial West; along railway Fort Road/167 Ave.; under wood. 19-08-2010. 53° 37' 43" N 113° 22' 51" W.
21. Edmonton; Ebbers industrial; along railway Fort Road/144 St.; under wood, 19-08-2010. 53° 36' 24" N 113° 24' 12" W.
22. Edmonton; along railway Fort Road/144 St.; under wood. 19-08-2010. 53° 36' 27" N 113° 24' 8" W.

Remarks

Because I collected in and near Edmonton, I found the paper by J. Van Es and D.A. Boag (1981) very helpful. However, it is not possible to compare the distribution of the molluscs I found to their paper because they do not specify which species were found at which sites. The annotated checklist of the recent terrestrial molluscs of Alberta (Forsyth, 2006) proved also highly useful.

An overview of my records is presented in tables 1 and 2. Finding *Gastrocopta tappaniana* is of special interest because it is only the second time this species is reported in the mala-



Fig. 3. *Gastrocopta tappaniana*.
Internet source.

ecological literature on Alberta (Van Es & Boag, 1981; Forsyth, 2006) (fig. 3). More important: it is a rare species (personal communication R.G. Forsyth). Given the large range of habitats not screened, more locations for this species (and for the genus as a whole) may be found at this north-eastern edge of its distribution. The habitat where it was found encompasses a seep in a mixed forest, probably on calcareous soil. Some shells from this location were covered with a light-coloured deposit. One specimen was found nearby in the same forest, but in a much drier place. Usually *Gastrocopta* species prefer dry habitats, but it is well known that *Gastrocopta tappaniana* lives in moister habitats (Nekola & Coles, 2010).

In the same seep I found *Carychium exiguum*, also a rare species in Alberta (fig. 4). I presume that further exploration in a more systematic way would yield many more new sites for these species.

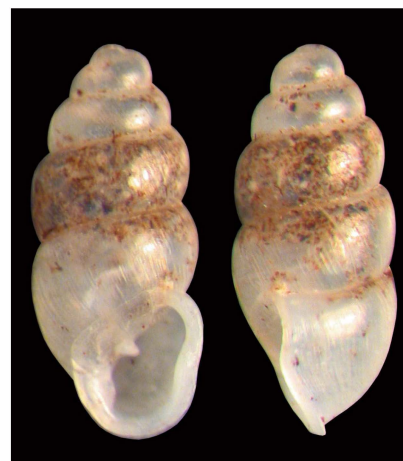


Fig. 4. *Carychium exiguum*.
Photo: Tello Neckheim

The *Columella* spec. found here may be *Columella simplex* or *Columella edentula*. *C. edentula* prefers a wet habitat, but because it is a juvenile shell it cannot be identified with certainty. *Deroceras* species were often found. *Deroceras reticulatum* is quite common in Alberta. I distinguished *Deroceras panormitanum* as being larger, less slimy and living in drier habitats than *Deroceras laeve*. In *Deroceras panormitanum* the light-coloured ring around the pneumostome is not always visible. Obviously only dissection certifies identification.

Pupilla species were found at Banff, near Lundbreck and in Edmonton. In Canada three species have been recorded: *Pupilla muscorum* (Linnaeus, 1758), *Pupilla hebes* (Ancey, 1881) and *Pupilla blandii* Morse, 1865. The species are still not very well known and even in Europe species are being rediscovered in "*Pupilla muscorum*" (Von Proschwitz et al., 2009). As Nekola & Coles (2010) mentioned, it will be necessary to analyse *Pupilla* in North America and Europe to establish the New and Old World species. *P. muscorum* was found in Edmonton and Lundbreck. *P. hebes* was found in Banff National Park (fig. 5). Shells collected from site 11 are between 3.0 and 3.5 mm high and do not have any lamella. There is almost no callus and the apertural lip is flared. The colour is like *P. muscorum*. It appears that *P. hebes* looks like the rediscovered species *Pupilla pratensis* (Clessin, 1871) in Europe (Von Proschwitz et al., 2009).



Fig. 5.
Pupilla hebes.
Photo: Tello Neckheim.



Fig. 6.
Helisoma trivolvis.
Photo: Tello Neckheim.

The size of the collected shells of the freshwater *Helisoma* species varies greatly (fig. 6). I followed R.G. Forsyth's (personal) recommendation not to distinguish subspecies. Also for *Lymnaea stagnalis* I did not distinguish subspecies.

Conclusion

During my stay in Alberta I observed and collected 29 species of terrestrial snails and 16 species of freshwater molluscs. Despite the warm and sunny weather I saw many species and I often found slugs in their natural habitats. In the examined anthropogenic sites I found far less terrestrial snails.

Correction of identification re. snails collected in 1996

After reviewing my collection I have corrected some identifications reported earlier (Neckheim, 1997). *Nesovitrea binneyana occidentalis* should be *Zonitoides arboreus* (fig. 7). This specie was collected at Smoky Lake.

Acknowledgements

I am indepted to Mr. Robert Forsyth (Royal British Columbia Museum, Victoria) for literature on Canadian snails and slugs and for assistance with the identification of several species. He also edited the English text and made several helpful suggestions. I also thank Mr. Tim Pearce for confirming the identification of *Gastrocopta tappaniana*, Mr. Dan Wilson (Smoky Lake, Alberta) for organizing and donating the Smoky Lake County Ownership Map and Mrs. Evelyn Dubetz (Edmonton) for donating maps of Edmonton and Alberta.



Fig. 7. *Zonitoides arboreus.*
Photo: Robert Forsyth.

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Website

The following website gives a complete literature list of Alberta and other states in Canada: <http://www.mollus.ca/canada/bibliography/data.php?prov=ab>

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Table 1. List of terrestrial molluscs observed and collected in Alberta

Scientific name	Location:																					
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
1 <i>Carychium exiguum</i> (Say, 1822)			X																			
2 <i>Cochlicopa lubrica</i> (Müller, 1774)			X	X	X	X																
3 <i>Columella</i> spec.			X																			
4 <i>Deroceras laeve</i> (Müller, 1774)	X																					
5 <i>Deroceras panormitanum</i> (Lesson & Pollonera, 1882)	X																					
6 <i>Deroceras reticulatum</i> (Müller, 1774)	X								X						X				X			X
7 <i>Discus shimkii</i> (Pilsbry, 1890)									X													
8 <i>Discus whitneyi</i> (Newcomb, 1864)			X	X	X	X	X										X	X				X
9 <i>Euconulus fulvus</i> (Müller, 1774)			X	X	X	X	X		X	X		X		X								
10 <i>Euconulus praticola</i> (Reinhardt, 1883)	X																					
11 <i>Gastrocopta tappaniana</i> (C.B. Adams, 1842)				X		X																
12 <i>Nesovitrea electrina</i> (Gould, 1841)			X	X		X	X															
13 <i>Novisuccinea</i> spec.		X																				
14 <i>Oxyloma</i> spec.	X						X										X	X				
15 <i>Punctum minutissimum</i> (I. Lea, 1841)					X	X	X															
16 <i>Pupilla hebes</i> (Ancey, 1881)										X	X											
17 <i>Pupilla muscorum</i> (Linnaeus, 1758)															X					X		
18 <i>Succinea</i> spec.		X																				
19 <i>Vallonia gracilicosta</i> Reinhardt, 1883			X	X	X	X	X	X												X	X	
20 <i>Vallonia pulchella</i> (Müller, 1774)																	X					
21 <i>Vertigo arthuri</i> von Martens, 1882			X	X																		
22 <i>Vertigo binneyana</i> Sterki, 1890	X																					
23 <i>Vertigo cristata</i> Sterki in Pilsbry, 1919									X													
24 <i>Vertigo elatior</i> Sterki, 1894	X		X																			
25 <i>Vertigo gouldii</i> (A. Binney, 1843)			X		X	X																X
26 <i>Vertigo modesta</i> (Say, 1824)													X	X								
27 <i>Vertigo ovata</i> (Say, 22)							X															
28 <i>Vitrina pellucida</i> (Müller, 1774)			X	X					X				X		X	X	X					
29 <i>Zonitoides arboreus</i> (Say, 1817)			X	X	X	X																

Table 2. List of freshwater molluscs observed and collected in Alberta

Scientific name	Location:		
	8	17	18
1 <i>Armiger crista</i> (Linnaeus, 1785)	X		X
2 <i>Gyraulus circumstriatus</i> (Tryon, 1866)			X
3 <i>Helisoma anceps</i> Menke, 1830)	X		
4 <i>Helisoma trivolvis</i> (Say, 1816)			X
5 <i>Lymnaea stagnalis</i> (Linnaeus, 1758)	X		X
6 <i>Lymnaeidae</i> spec.			X
7 <i>Physella</i> spec.	X		X
8 <i>Pisidium</i> spec.	X		
9 <i>Planorbula armigera</i> (Say, 1821)	X		
10 <i>Promenetus exacuous megas</i> (Dall, 1905)			X
11 <i>Sphaerium</i> spec.	X		
12 <i>Stagnicola elodes</i> (Say, 1821)	X	X	X
13 <i>Stagnicola caperata</i> (Say, 1829)			X
14 <i>Valvata sincera sincera</i> Say, 1824	X		
15 <i>Valvata sincera helicoidea</i> Dall, 1905	X		
16 <i>Valvata tricarinata</i> (Say, 1870)	X		

Appeltjes-eitjes: help mee om exotische appelslakken te signaleren!

Adriaan Gmelig Meyling & Rykel de Bruyne

Apples and eggs: help us to signal exotic Apple snails!

Summary. There is a chance that exotic Apple snails (e.g., *Pomacea canaliculata*) will reach the Netherlands. Within Europe, this snail already prevails in the Ebro delta in Spain. If adapted to the Dutch climate the snail may develop into a pest that may seriously harm nature as well the economy. The reader is urged to look for the snail and its characteristic egg masses, usually deposited just above the surface of fresh water on branches, poles, etc. Finds should be reported immediately to anemoon@cistron.nl.

Inleiding

Appelslakken worden vanwege hun vorm, kleur en afmetingen veel in aquaria gehouden. Wie een paludarium heeft, waarbij waterplanten en houtstronken boven water uitkomen, kan zien dat ze hun opvallende roze eieren vooral boven de waterspiegel

afzetten, waar de jonkies als mini-slakjes uitkomen. Leuk om te zien. Maar in de vrije natuur kunnen appelslakken een gevaar vormen voor de Nederlandse natuur en de Europese economie. Daarom wordt aan een ieder gevraagd uit te kijken naar appelslakken en hun eieren in onze vrije natuur.