

New data on the terrestrial gastropods of northern Nordland and Troms counties, N. Norway

JOHAN ANDERSEN

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Records and habitats of terrestrial snails and slugs from Nordland and Troms counties are reported. The total number of terrestrial gastropod species that have been recorded in Troms is now 34 or 35. 14 of the species present in Troms are absent in the most continental districts of Fennoscandia. The number of species present in Nordland is obviously larger than in Troms. Four or five species are synanthropic in Troms. Seven species tend towards a habitat shift in the study area: they occur in warm and rather dry habitats in Nordland and Troms, whereas they are hygrophilous in more southern areas.

Johan Andersen, Institute of Biology and Geology, University of Tromsø, N-9001 Tromsø, Norway.

INTRODUCTION

Since Økland (1925) published his work about the distribution of the terrestrial gastropods in Norway, few new data have been reported from northern Norway. Økland (1937) has made a survey of the land gastropods of Lofoten and scattered information is available in Rensch & Rensch (1932), Odhner (1951), Waldén (1971) and Vader (1979). Kerney & Cameron (1979) give maps of the distribution of the terrestrial gastropods in Western Europe, including Fennoscandia. These maps show that much new information about the distribution of the species in northern Norway has accumulated since Økland (1925, 1937), Rensch & Rensch (1932) and Odhner (1951) published their works. This is mostly due to the extensive field investigations and studies of museum collections made by H.W. Waldén. The maps of Kerney & Cameron (1979), however, do not show the details in the distribution of the species and the border of their known distributional area.

Very little is known about the habitat distribution of the terrestrial gastropods in the counties of Nordland and Troms. As many species are close to, or at, the northern border of their distributional area in these counties it is of interest to know the ecological demands of the species here. As pointed out by Kerney & Cameron (1979), gastropods are often more stenoeccious in marginal parts of their distributional area.

In the present survey I report new records of gastropods with notes on habitat distribution from some localities in northern Norway.

MATERIAL AND METHODS

The positions of the localities investigated are shown in Fig. 1. Most of the investigations were made in Skjomen in Nordland county (about lat. 68°15'N, long. 17°15'E) in June and September 1975–1979, and in Tromsø in the outer part of Troms county (lat. 69°40'N, long. 19°E) in May–October 1974–1981. Some collections were also made at some places on Kvaløya in Troms, May 1976 and September 1979. In addition some samples were taken in the following localities in the inner part of Troms:

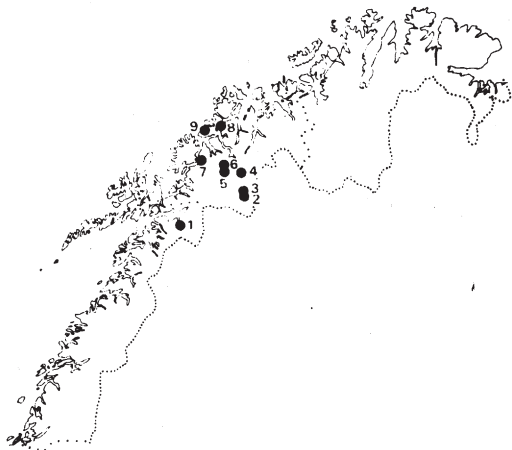


Fig. 1. Map of the localities investigated. 1. Skjomen. 2. Lille Jerta. 3. Skakterdalen. 4. Rostavatn. 5. Øverbysgd. 6. Takvatn. 7. Sørreisa. 8. Tromsø. 9. Kattfjorden, Kvaløya.

Takvatn (lat. 69°07'N, long. 19°05'E) and Rostavatn (about lat. 69°N, long. 19°37'E), 12 July 1976 and 15 July 1978.

Øverbygd (lat. 69°N, long. 19°10'E), October 1975;

Skakterdalen and Lille Jerta in Dividalen (about lat. 68°50'N, long. 19°50'E), 25 June 1969 and 15 July 1978,

Sørreisa (lat. 69°05'N, long. 18°15'E), May 1975.

Nearly all the slugs were collected by hand. Much of the snail material from Skjomen, Tromsø and Øverbygd was collected by sifting of litter within randomly chosen squares of 0.5 x 0.5 m². The material was subsequently investigated under a magnifying glass (10x) in the laboratory. The snails from the other localities were collected by hand.

RESULTS AND DISCUSSION

The many question marks in Table 1 are due to the fact that the species concept has changed much since the work of Økland (1925) and that details in the maps of Kerney & Cameron (1979) are unclear. In addition to the species listed in Table 1, *Vallonia pulchella* (Muller), two species of the family Succineidae and perhaps *Cochlicopa lubricella* (Porro) also occur in Troms county. Thus, the total number of known species in the county is 34 or 35. *Arion fasciatus*, *A. hortensis*, *A. silvaticus* and *Trichia hispida* have probably not been reported earlier from as far north as the outer parts of Troms county. The map in Kerney & Cameron (1979) indicates that *Limax tenellus* has not been found north of Nordland county, but it has also been reported from Kåfjord in Finnmark (Økland 1925). Recently it has also been found on the island of Loppa at the coast of western Finnmark (Vader 1979).

The total number of species in Nordland county is obviously higher than in Troms; several species have their northernmost occurrence in Nordland (Økland 1925, Waldén 1971, Kerney & Cameron 1979). Two of these species, *Vertigo pusilla* and *V. substriata*, seem to have their northern distributional limit in the Ofoten area in the northern part of Nordland county.

Arion fasciatus, *A. hortensis*, *Deroceras reticulatum*, *Trichia hispida* and perhaps *Arion silvaticus* (see below) are anthropochorous species in Troms. At the same time these species have a western distribution in northern Norway. On the whole the infusion in Troms county of gastropod species with a western distribution in

northern Norway is large. Thus, 14 of the species present in northern Fennoscandia are absent in the most continental districts and some species e.g. *Arion ater*, have a strictly atlantic distribution.

For the non-anthropochorous, western species climate has been emphasized as the limiting factor for the distribution (Økland 1925). For the synanthropic species the question arises whether their western distribution also is a result of anthropochorous dispersal. Thus, up to recent time the main communication has been along the coast. *Vertigo ronnebyensis*, *Zoogenetes harpa*, *Discus ruderratus*, and *Nesovitrea petronella* are boreal species which seem to be absent in the coastal areas of Western Norway (Solhøy 1976). However, two of these species occur in the coastal districts of Sør-Trøndelag county (Backhuys 1969) whereas three of the species are present in coastal districts of Troms county. Thus, the coastal districts of Troms contain a mixture of more or less strict western species, boreal species, subarctic/subalpine-arctic/alpine species (*Vertigo modesta*, *Columella columella*) and ubiquitous species.

Columella columella, *Deroceras laeve*, *Vertigo lilljeborgi* and *Euconulus alderi* were in the localities studied found only in mires.

The two last mentioned species are known exclusively from such habitats (Lohmander 1959, Waldén 1969, Kerney & Cameron 1979), whereas the two other species occur in dry or mesic habitats at places with cold summers, e.g. above timber limit and in the Faroe islands (Solhøy 1976, 1981). *Columella columella* and *Vertigo modesta* are reported to be calciphile (Waldén 1966, Valovirta 1967, Solhøy 1976, Kerney & Cameron 1979) which is in accordance with the present results.

Columella aspera, *Vertigo ronnebyensis* and *Zoogenetes harpa* occurred in habitats dominated by *Empetrum* spp. and *Vaccinium* spp. which is in accordance with the data given by Valovirta (1967), Kerney & Cameron (1979) and Waldén (1981). The first mentioned species was found on a heath with very poor soil (pH: 4.4–5.0), whereas the soil was less acid (pH: 5.0–5.5) at the places where the two other species occurred. According to Waldén (1981) it is doubtful whether *C. aspera* can persist at high pH.

Vertigo substriata, *V. pusilla*, *V. alpestris*, *Pupilla muscorum* and *Vallonia costata* were found only in dry, warm localities. This is in accordance with the general habitat requirements of the four last mentioned species. According to

Table 1. Data on the terrestrial gastropod species collected by the author in northern Nordland and Troms.

species	collected by the author in:		Kvaløya, Troms, 0	Troms, I	Previously found in:		Ecological characteristic
	Skjomen, N. Nordland Troms, 0	Tromsø, Troms, 0			Nordland, N of lat. 67°15'N	Troms 0 1	
<i>Cochlicopa lubrica</i> (Müller)	+	+	—	+(R, Ø)	+	+	e, not ol.
<i>Columella edentula</i> (Draparnaud)	+	+	—	+(R, Ø)	+	+	e, not ol.
<i>C. columella</i> (Martens)	—	+	—	?	?	?	ca mires
<i>C. aspera</i> Waldén	—	+	—	—	+	?	poor <i>Empetrum</i> heath
<i>Vertigo pusilla</i> (Müller)	+	—	—	—	—	—	d schist slope
<i>V. substriata</i> (Jeffreys)	+	—	—	—	—	—	d schist slope
<i>V. modesta</i> Say	+	—	—	+(R)	+	+	lu, ca places
<i>V. ronneybyensis</i> Westerlund	—	—	—	+(Ø)	?	+	woods with <i>Empetrum</i>
<i>V. liljeborgi</i> (Westerlund)	—	—	—	+(T)	?	+	mires
<i>V. alpestris</i> Alder	+	—	—	—	+	?	d schist slope
<i>Pupilla muscorum</i> (L.)	—	—	—	—	+	+	d meadow close to sea
<i>Vallonia costata</i> (Müller)	+	—	—	—	+	+	d schist slope
<i>Zoogenetes harpa</i> (Say)	+	—	—	+(Ø, R)	?	+	woods with <i>Empetrum</i>
<i>Punctum pygmaeum</i> (Draparnaud)	+	—	—	+(R, Ø, D, T, S)	+	+	e
<i>Discus ruderatus</i> (Férussac)	+	—	—	—	+	+	e
<i>Arion ater</i> (L.)	—	—	—	—	+	+	e
<i>A. subfuscus</i> (Draparnaud)	+	+	—	+(R, Ø, D)	+	+	e
<i>A. fasciatus</i> (Nilsson)	—	+	—	—	—	—	cu
<i>A. silvaticus</i> Lohmander	—	+	—	—	+	+	cu, lu
<i>A. hortensis</i> Férussac ^{xx}	—	+	—	—	—	—	cu
<i>Vitrina pellucida</i> (Müller)	+	+	—	+(R, Ø)	+	+	e
<i>Nesovitrea hammonis</i> (Ström)	+	+	—	—	+	+	h woods, mires
<i>N. petronella</i> (Pfeiffer)	+	+	—	—	+	+	e
<i>Limax tenellus</i> (Müller)	+	+	—	—	+	+	lu
<i>L. marginatus</i> (Müller)	+	+	—	—	+	+	lu
<i>Deroceras laeve</i> (Müller)	—	—	—	+(T)	+	?	mires
<i>D. agreste</i> (L.)	+	+	—	—	+	?	meadow, d wood
<i>D. reticulatum</i> (Müller)	+	+	—	—	+	?	cu
<i>Euconulus fulvus</i> (Müller)	+	+	—	+(R, Ø, T)	+	+	e
<i>E. alderi</i> (Gray)	—	+	—	—	?	?	mires
<i>Clausilia bidentata</i> (Ström)	—	+	—	+(S)	+	+	e
<i>Trichia hispida</i> (L.)	—	+	—	—	—	?	cu
<i>Arianta arbustorum</i> (L.)	+	+	—	+(Ø, D)	+	+	e, not ol. ^x

D: Dividalen
 I: Inner parts
 O: Outer parts
 R: Rostavatn
 S: Sørreisa
 T: Takvatn
 Ø: Øverbygd
 ca: Calcareous
 cu: cultivated ground
 d: dry
 e: euryoecious
 h: humid
 lu: luxuriant deciduous woods
 ol: oligotrophic habitats
 x: also found above timber limit
 xx: Divided in three species by Davies (1977)

Kerney & Cameron (1979), *V. substriata* occurs in moist habitats.

Arion fasciatus, *A. hortensis*, *Deroceras reticulatum* and *Trichia hispida* were only present in habitats influenced by man, such as roadsides, gardens and fallow land. The three first mentioned species are synanthropic also in other parts of Fennoscandia (Økland 1925, Lohmander 1959, Waldén 1955, 1969, Valovirta 1967, Lindroth et al. 1973, Solhøy 1976). *A. silvaticus* has also been found in luxuriant deciduous woods but rather close to human settlements so also this species may be synanthropic.

There is a marked difference in the habitat requirements of the two closely related species *Deroceras reticulatum* and *D. agreste* in northern Norway. Whereas *D. reticulatum* is synanthropic, the other species has not been found on typically cultivated ground.

Nesovitrea hammonis has only been collected in moist places within the study area. Elsewhere the species occurs also in dry habitats (Kerney & Cameron 1979).

Most of the other species listed in Table 1 are regarded as more or less euryoecious (see e.g. Kerney & Cameron 1979). This also applies to most of the species within the study area. They have been found in dry as well as in moist places and in woods as well as in open habitats. It is noteworthy, however, that *Cochlicopa lubrica*, *Columella edentula* and *Arianta arbustorum* seemed to be absent in typically oligotrophic sites.

It is concluded that a majority of the species treated here have similar habitat requirements in northern Norway as elsewhere. However, *Vertigo substriata*, *Cochlicopa lubrica*, *Columella edentula*, *Punctum pygmaeum*, *Vitrina pellucida*, *Clausilia bidentata* and *Arianta arbustorum* occur in warm and rather dry habitats in Nordland and Troms, whereas they are quite hygrophilous in more southern areas. Similar habitat shifts are known among carabid beetles (Lindroth 1949). According to Lindroth (1949) such habitat shifts are caused by microclimatic conditions.

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REFERENCES

Backhuys, W. 1969. Notes on a collection of non-marine Mollusca from the province of Sør-Trøndelag, Norway. *Basteria* 33, 69—83.

- Davies, S.M. 1977. The *Arion hortensis* complex, with notes on *A. intermedius* Normand (Pulmonata: Arionidae). *J. Conch.* 29, 173—187.
- Kerney, M.P. & Cameron, R.A.D. 1979. *A field guide to the land snails of Britain and North-West Europe*. Collins, London.
- Lindroth, C.H. 1949. Die fennoscandischen Carabidae III. *Göteborgs K. Vetensk.-o. Vitterh. Samh. Handl. Ser. B4*.
- Lindroth, C.H., Andersson, H., Bödvardsson, H. & Richter, S.H. 1973. Surtsey, Iceland. The development of a new fauna, 1963—1970. Terrestrial invertebrates. *Ent. Scand. Suppl.* 5, 1—280.
- Lohmander, H. 1959. Faunistiskt fältarbete i västra och norra Jylland 1954—57. Landmolluskerna. *Göteborgs naturh. Mus., Årstryck* 1959, 33—104.
- Odhner, N.H. 1951. Swedish high mountain Mollusca. The mountain fauna of the Virihaure area in Swedish Lapland. *Kungl. Fysiogr. Sällsk. Handl. N.F.* 61, 26—50.
- Økland, F. 1925. Die Verbreitung der Landgastropoden Norwegens. *Skr. Norske Vidensk. Akad. I. Mat.-Nat. kl.* 8, 1—168.
- Økland, F. 1937. Die Land- und Süßwassermollusken der Lofoten-Inseln. *Arch. Moll.* 69, 34—43.
- Rensch, I. & Rensch, B. 1932. Zur Landschneckenfauna von Nordskandinavien. *Sber. Ges. naturf. Freunde Berl.* 1931, 291—299.
- Solhøy, T. 1976. Terrestrial gastropods (Mollusca, Gastropoda: Basommatophora and Stylommatophora). *Fauna of Hardangervidda* 10, 24—45.
- Solhøy, T. 1981. Terrestrial invertebrates of the Faroe Islands: IV. Slugs and snails (Gastropods): Checklist, distribution, and habitats. *Fauna norv. Ser. A.2*, 14—27.
- Vader, W. 1979. En landisopode *Trichoniscus pusillus* på 70°N. *Fauna* 32, 121.
- Valovirta, I. 1967. List of Finnish land gastropods and their distribution. *Ann. zool. fenn.* 4, 29—32.
- Waldén, H.W. 1955. The land Gastropoda of the vicinity of Stockholm. *Ark. Zool., Ser. 2*, 7, 391—448.
- Waldén, H.W. 1966. Einige Bemerkungen zum Ergänzungsband zu Ehrmann's «Mollusca», in «Die Tierwelt Mitteleuropas». *Arch. Moll.* 95, 49—68.
- Waldén, H.W. 1969. A survey of the terrestrial Gastropoda of Halland. *Fauna och Flora* 64, 154—176.
- Waldén, H.W. 1971. The land mollusc fauna of the lake Tärnasjön district in Lycksele Lappmark. With some introductory information about the biological survey of the large river valleys in northern Sweden 1959—68. *Fauna och Flora* 66, 53—66.
- Waldén, H.W. 1981. Communities and diversity of land molluscs in Scandinavian woodlands. 1. High diversity communities in taluses and boulder slopes in SW Sweden. *J. Conch.* 30, 351—372.