

Moesgaards landsnegle

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I 2014, 2016 og 2017 blev landsneglefau- naen (Mollusca) i herregårdsparken Moes- gaard undersøgt. Området, som har en størrelse på et par kvadratkilometer, ligger 8 km S.S.E. for Aarhus og grænser op til Aarhus Bugt (Kattegat). Herregårdsparken Moesgaard består af en blanding af skov, græsareal, sump, sumpskov og ferskvand. En del af området, hvor Giberåen befinder sig er et beskyttet Natura 2000 område. I alt dokumenteredes faunaen på 73 lokalite- ter (fig. 1). På 56 lokaliteter var landsnegle til stede.

HABITATER

Græsland: 5 lok. På en lokalitet blev der undersøgt en tør græsbevoksning. Det var biotop for Pletbåndet solsnegl (fig. 2), Oval græssnegl og Lille agatsnegl: en fattig fauna med tørke- og varmeresistente arter. Desuden blev der også på nogle andre græs- arealer fundet en artsfattig fauna. I et vådt græsningsområde blev der fundet 16 arter. Det er en bemærkelsesværdig rig fauna for et overdrev med kør.

Sumpe: 7 lok. Sumpe findes især langs Giberå eller på steder med nedsvømning (fig.

3). Sumpenes landfauna er ret rig; op til 20 arter. Udeover Eng-dværgsnegl, Almindelig ravsnegl, Slank ravsnegl, Solbærvindel- snegl, Glat græssnegl (lok. 31) og Glissnegl findes her også Busksnegl, Havesnegl og Kratsnegl. Bortset fra Solbærvindelsnegl blev der ikke fundet andre vindelsnegle. Andre små arter var Kronesnegl, Kub- snegl (fig. 4), Ru valsepuppesnegl og Valse- puppesnegl, Priksnegl, Krystalsnegl, Topas- negl. Lidt større arter (op til ca. 1 cm) er Agatsnegl, Knapsnegl, Lille rovsnegl, Håret snegl. Større end 1 cm er Sumpfoldsnegl og Lille foldsnegl. Også Gul glansnegl og Kælderrovsnegl var til stede.

Skovsumpe: 6 lok. Skovsumpene (sump- skove) i Moesgaard er værdifulde områder. Fugtige steder forekommer skiftevis med sumpet bund og lavt vand (fig. 5). Faunaen ligner den i moserne. Vi fandt bl.a. Glat foldsnegl (fig. 6), Sumpfoldsnegl, Lille foldsnegl og Busksnegl. Den rigeste prøve indeholdt 22 arter; i alt blev 32 arter fun- det.

Bøgeskov: 8 lok. Bøgeskov forekommer vidt udbredt i regionen, op til stranden. På nogle steder kryber nøgensnegle, såsom

Sort skovsnegl og Rød skovsnegl i Oldtids- skoven. På grund af kalkfattig bund og det tykke lag af tørre bøgeblade er der næsten ingen sneglefauна til stede, men langs kanten af skovbassinerne og i skovkanten blev der fundet 29 arter, som Kratsnegl, Havesnegl og de to arter af sandkornsnegl, Almindelig ravsnegl, Kubensnegl, Glat fold- snegl, Lille foldsnegl, Priksnegl, Knapsnegl og Rødlig ravsnegl.

Blandingsskov, lille skov: 11 lok. Spredt i hele området blev der undersøgt flere typer blandet løvskov. For eksempel bemærkedes Bygkornsnegl (fig. 7), Håret snegl, Have- snegl og de store snegle Leopardsnegl og Rød skovsnegl. På en enkelt lokalitet fandtes 83 Kubensnegle i en førneprøve. I alt blev der fundet 38 arter. Det rigeste sted (25 arter) var en løvskov med sivningsvand, der løber igennem.

Nåleskov: 1 lok. I denne type skov er der næsten ingen snegle med skal, men nogle nøgensnegle (Rød skovsnegl) kryber på faldne træer. På steder uden undervækst kunne ikke findes snegle.

Skråninger ved havet: 5 lok. Bakkerne mod havet er ofte tæt bevokset med urter, buske og træer. Af de 31 arter af landsnegle, som er fundet på skråninger, er nogle kun fundet få gange eller kun en gang. Regelmæssigt fandtes Skov-sandkorns- negl, Agatsnegl, Rødlig ravsnegl og med ringe antal Kronesnegl, Kubensnegl, Glat foldsnegl, Knapsnegl, Krystalsnegl og Håret snegl. På en af bakkerne forekom Lampesnegl.

Højvandslinjen på stranden: 5 lok. Et særligt miljø er den smalle overgangszone på stranden til tørt land. Ved Moesgaard er denne zone omkring 1 m bred og kendtegnet ved materiale afsat af havet under meget høje tidevand fig. 8. Her fandtes 27

Summary

The land molluscs of Moesgaard (Aarhus Denmark)

An area of a few square kilometers, near Aarhus (Denmark) was investigated for land snails and slugs (molluscs). This area – Moesgaard – consists of a variety of woodland, grassland, and marshland, as well as watercourses and stagnant freshwater. Circa 51 species were found, and a table presents a comprehensive list of these species, most of which are widespread in Northwestern Europe (Denmark). *Spermodes lamellata* was found at 16 different locations. On the beach, along the high watermark, *Vertigo angustior* was present in high numbers at some locations. This small land snail is endangered in Europe and on the EU Red List. Table 1 shows a list of all species recorded and their relative frequency at the various habitat types. Fig. 1 shows the number of species in relation to habitat type.

Keywords: Mollusca, land snails, landsnegle, Denmark, Aarhus, Moesgaard

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arter, herunder et bemærkelsesværdigt antal af den sjældne Skæv vindelsnegl (lok. 45; fig. 9). Det er dog ikke enestående.

Også på Langeland og en del andre steder i Danmark findes skæv vindelsnegl på førn i den øverste del af strandvolde. Pletbåndet solsnegl var den eneste levende snegl på en meget lille sandbunke, et par kvadratmeter i areal.

Landsnegle i områder i nærheden af Moesgaard. Ved tilfældige observationer var det kendt, at nogle arter er til stede i nærheden af Moesgaard. En af dem er Vinbjergsneglen (*Helix pomatia*). Denne største landsnegl i Danmark lever f.eks. i Beder, Horsens, Ajstrup og Odder. Lundsnegl (*Cepaea nemoralis*) blev ikke fundet i Moesgaard. Dog fandtes denne art på forskellige steder i Aarhus' botaniske have. Sneglen var også til stede i nærheden af Odder. Slank foldsnegl (*Alinda biplicata*) var til stede i Beder og Kratnøddesnegl (*Euomphalia strigella*) fandtes på en skovbevokset bakke ved stranden nær Beder.

KONKLUSION

Moesgaard har en ret rig landsneglefauna. I alt fandtes mindst 51 arter (se tabel 1, bagest). De fleste af dem er almindelige i Nordvesteuropa. Visse arter, heraf nogle ret almindelige, blev kun fundet enkelte steder. Til gengæld blev nogle ellers ret sjældne arter fundet i overraskende stort antal. Kubesneglen, en lille art (ca. 2 mm) blev fundet på 16 lokaliteter. Dens udbredelse omfatter Nordvesteuropa og Portugal, med centrum netop i Danmark. Visse steder, så som Nordøsttyskland, regnes den som indikator for gammel, uforstyrret, fugtig, bøgeskov, hovedsagelig i kystområder. Den er i generel tilbagegang. I Danmarks Fauna fra 1911 hedder det: "I Jylland (Øst- og Midtjylland) er den meget almindelig, på øerne . . . er den sjældnere". Trods tilbagegang er den stadig ret udbredt i dag (K. Fog, pers. comm.), og visse steder, som altså Moesgaard, talrig. Dens status er formentlig bedre i Danmark end de fleste andre steder. En anden overraskende talrig art var Skæv vindelsnegl, som ellers er sjælden, men som nogle steder på stranden, i højvandslinjen, forekom i store mængder. Denne lille landsnegl er gået voldsomt

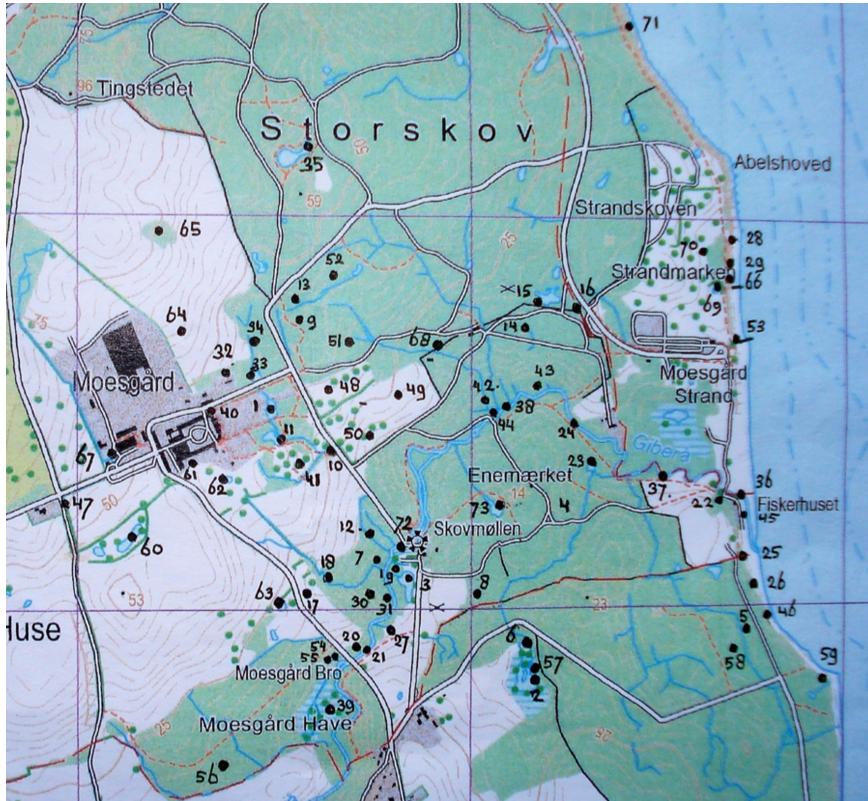


Figure 1. Aarhus, Moesgaard. Area with investigated locations (•). Distance between co-ordinate lines 1 km
Aarhus, Moesgaard. Område med undersøgte lokaliteter (•). Afstanden mellem koordinatlinjerne er 1 km

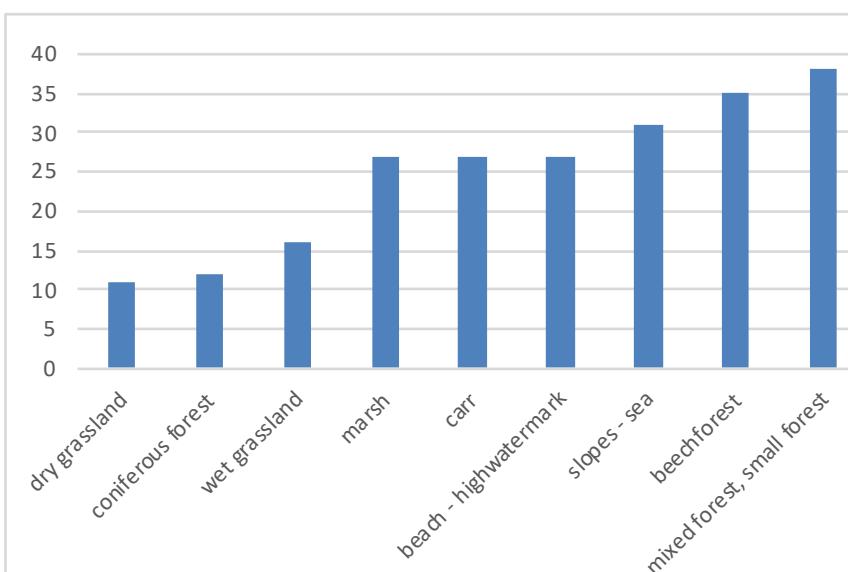


Diagram 1. Number of mollusc species found in various habitats
Antal landsneglearter fordelt på habitater



Figure 2. *Candidula intersecta* between the vegetation at loc. 64 (18-9-2017). Photo: Wim Kuijper
Pletbåndet solsnegl mellem vegetation på lok. 64 (18-9-2017)



Figure 3. Marsh (loc. 16) with 3 water- and 13 land species, e.g. both *Carychium's*, *Spermodes lamellata* and *Vertigo antivertigo* (27-8-2016). Photo: Wim Kuijper
Sumpsted (lok. 16) med 3 vand- og 13 landarter, f.eks. både dværgsnegl, Kubesnegl og Solbærvindelsnegl (27-8-2016)

tilbage, også i Danmark, og er på EU's Rødliste. Den er omfattet af Habitatdirektivet. Både Kubesnegl og Skæv vindelsnegl er sammen med mange andre arter værd at beskytte.

INTRODUCTION

In 2014, 2016 and 2017 an area of a few square kilometers, situated 8 km S.S.E. of Aarhus and bordering the Aarhus Bugt (Kattegat) (fig. 1) was investigated for land snails, freshwater snails and freshwater mussels (Mollusca). This area – Moesgaard – consists of a variety of woodland (wet to dry), grassland, marsh and freshwater. A section of the area around the Giberå stream comprises a protected Natura 2000 reserve (nr. 234) (Miljøministeriet, 2014).

The extent of the woodlands has barely changed over the past 200 years. Most of the beech woods were planted between 1860 and 1925 and the wet areas are largely occupied by ash and alder. These wetlands have a naturally high water table and rich vegetation. Important elements in the landscape constitute the meandering Giberå and the land to sea transition zone. The subsoil of the area consists of loam, which ensures the presence of stagnant water. At various places, however, seepage also occurs - especially at the coast where the substrate is calcareous. The elevation of the area ranges between 0 and 75 m a.s.l.

The present article introduces the land snails of Moesgaard, while the freshwater species are described in a second paper (Kuijper, in prep.).

The research covers most of the molluscs living at Moesgaard. It is possible, however, that more species may be found, especially slugs, since the list appears incomplete. There are a limited number of articles concerning the molluscan fauna of Denmark. Recent examples pertain to the study by Cejka et al. (2011) on the molluscan fauna of Frederiksborg Castle Gardens, Hillerød and a study by Fog & Riis Nielsen (2017) on the molluscs of undisturbed and disturbed deciduous forest. Thus, the current malacofauna investigation of Moesgaard contributes data in an otherwise sparse area of research.

METHOD

This study focuses on a variety of habitats. Terrestrial molluscs were observed in wet and dry forests, within grasslands, on slopes facing the Aarhus Bugt, and at the beach.

Sample locations were chosen among homogeneous vegetation. At each location (fig. 1), roughly two hours were spent looking for living snails and empty shells by eye, at an area of some tens of m². Litter was also gathered for microscopic analysis in the laboratory. This material, circa 1 liter within some m², revealed small species and juvenile animals. Material till 0,5 mm was examined. Depending on the litter/sediment composition and the number of recovered animals, it took 1 to 4 hours to analyze a sample.

Mollusc identifications were made using Welter-Schultes (2012), Wiese (2014) and a personal reference collection. Some iden-

tifications of young animals proved problematic, such as *Columella* and *Euconulus*. *Euconulus* with spiral lines on the base of the shell were deemed *E. alderi* (*E. praticola* partly?), while very glossy shells without lines were deemed *E. fulvus*. In regard to the slugs, the author's experience was insufficient to provide secure identifications for all the animals and anatomical research was not conducted.

In total, fauna from 73 locations were recorded, 63 of which contained land snails.

HABITATS AND RESULTS

Table 1 displays the land molluscs species from each habitat at Moesgaard, while diagram 1 notes the number of species present at each landscape feature.

Grassland, with low or high vegetation (wet-dry): 5 locations (17, 39, 48, 49, 64)

A dry, short-cut grassland (loc. 64) was examined directly east of the Moesgaard Museum. Observations on this location included some herbs between the grass and bare patches of land. These conditions make up the biotope for *Candidula intersecta* (fig. 2), *Vallonia excentrica* and *Cochlicopa lubricella*; a poor fauna with species that are drought and heat tolerant. Poor fauna was also found at some of the other grassland locations (loc. 48 and 49), where sheep or cows were grazing. East of the Bispelundvej, however, in a wet pasture (loc. 17) with a lot of tall herbs and pieces of wood, 14 species were found including *Carychium minimum*, *Oxyloma elegans/sarsi*, *Vertigo antivertigo*, *Euconulus alderi*, *Oxychilus alliarius*, *Zonitoides nitidus*, *Ari-*



Figure 4. *Spermodea lamellata* at loc. 16 (see fig. 3) (27-8-2016)
Kubesnegl på lok. 16 (se fig. 3) (27-8-2016). Photo: Wim Kuijper



Figure 6. During rainy and damp weather, *Cochlodina laminata* crawls on trees (loc. 8) (25-5-2014). Photo: Wim Kuijper
Ved regnfuldt og fugtigt vejr kryber Glat foldsnegl på træer (lok. 8) (25-5-2014)

on rufus, the water snail *Galba truncatula* and slugs. This assemblage constitutes a remarkably rich fauna for a meadow with cows.

Marsh: 7 locations (16, 27, 31, 35, 42, 43, 58)

This research area comprised several small and large swamps (loc. 16: fig. 3). These wet, well-vegetated sites were either located next to the Giberå or at places with seepage. The most abundant vegetation consisted of various moisture-loving herbs (e.g. sedges), though bushes and trees also grew in some places – namely, in the transition area from marsh to carr. In these habitats, land and water snails cohabitated.

The land fauna was abundant: up to 27 species. Some of them were moist-loving, such as *Carychium minimum*, *Succinea putris*,

Oxyloma elegans/sarsi, *Vertigo antivertigo*, *Vallonia pulchella* (loc. 31) and *Zonitoides nitidus*. The marsh also contained the larger land snails *Fruticicola fruticum*, *Cepaea hortensis* and *Arianta arbustorum*. Besides *Vertigo antivertigo*, no other *Vertigo*'s were found. Small species comprised *Acanthinula aculeata*, *Spermodea lamellata* (fig. 4), *Columella aspera* and *C. edentula*, *Punctum pygmaeum*, *Vitreor crystallina*, *Euconulus alderi* and *E. fulvus*, while slightly larger species (up to circa 1 cm) comprised *Cochlicopa lubrica*, *Discus rotundatus*, *Aegopinella pura*, *Trochulus hispidus*. The two sinistral, fusiform *Clausilia pumila* and *Clausilia bidentata*, were larger than 1cm. Additionally, *Aegopinella nitidula* and *Oxychilus cellarius* were also both present.

Carr: 6 locations (6, 7, 8, 19, 57, 73)

The carrs (swamp forests) of Moesgaard



Figure 5. The carrs (swamp forests) of Moesgaard are valuable areas. Loc. 73 (20-9-2017). Photo: Wim Kuijper
Moesgaards sumpskov er et værdifuldt område. Lok. 73 (20-9-2017)



Figure 7. *Merdigera obscura* in a forest east of Moesgaard Museum (loc. 34) (14-9-2017). Photo: Wim Kuijper
Bygkornssnegl i skoven øst for Moesgaard Museum (lok. 34) (14-9-2017)

are valuable areas: they are rather open with varied herb, shrub and tree growth (alder, ash). Damp spots alternate with wet patches and shallow water (fig. 5), which makes the fauna relatively rich. Several water species were found, as well as numerous land snail species. Some prefer very wet biotopes: *Carychium minimum*, *Succinea putris*, *Oxyloma elegans/sarsi*, *Cochlicopa lubrica*, *Vertigo antivertigo*, *Zonitoides nitidus*; while others live in drier, yet still damp, places: *Carychium tridentatum*, *Cochlodina laminata* (loc. 8: fig. 6), *Clausilia pumila*, *Clausilia bidentata*, *Fruticicola fruticum*, *Arianta arbustorum*, *Cepaea hortensis* and slugs. At two locations (57 and 73), *Spermodea lamellata* and *Acanthinula aculeata* were observed. The richest litter sample contained 24 species and altogether, 34 species were found in these carrs.

Beech forest: 8 locations (4, 12, 13, 14, 23, 30, 55, 68)

Beech forests occurred throughout the area up to the beach. In large parts of these forests, virtually no snails were present – only slugs, such as *Arion ater* and *A. rufus* at Oldtidsskoven (loc. 4), crawling in some places. There tends to be no snail fauna in dry forests due to decalcification and a thick layer of dry leaves. The presence of snail fauna usually increases, however, at the fringes of these forests, especially if there is seepage of calcareous water nearby. The fringes of the beech forests at Moesgaard were inhabited by different plant species, and mollusca were indeed discovered in these habitats, as well as along the edges of the forest pools. In total, 35 species were recorded. Most striking were the two larger snails *Arianta arbustorum*, *Cepaea hortensis*, the two *Carychium* species, *Succinea putris*, *Spermoea lamellata*, *Cochlodina laminata*, *Clausilia bidentata*, *Punctum pygmaeum*, *Discus rotundatus*, and *Aegopinella nitidula*.

Mixed forest and small forest:**11 locations** (18, 20, 22, 32, 34, 41, 44, 47, 52, 56, 65)

In these habitats, 11 sample locations deemed ‘mixed forests’ and ‘small forests’, were examined. The locations included several types of deciduous forests, small bushes in an orchard, a roadside with trees and the remnants of an isolated forest in grassland. The following were regularly encountered: *Carychium tridentatum*, *Cochlicopa lubrica*, *Merdigera obscura* (loc. 34; fig. 7), *Cochlodina laminata*, *Clausilia bidentata*, *Discus rotundatus*, *Aegopinella nitidula*, *Oxychilus cellarius*, *Trochulus hispidus*, *Arianta arbustorum*, *Cepaea hortensis* (loc. 20), and the big slugs *Limax maximus* (loc. 41) and *Arion cf rufus* (loc. 34). At location 52, 83 individuals of *Spermoea lamellata* were recovered from a single litter sample. A total of 38 species were found; the richest place (25 species) pertained to a deciduous forest with seepage water running through it.

Coniferous forest: 1 location (51)

In this forest type, there were almost no snails with shells, only some slugs were crawling (*Arion rufus*) on fallen wood. At the sole location in a planted coniferous forest, a litter sample full of needles was collected from under some grass, moss, wood sorrel, sedge and bramble. It contained *Discus rotundatus*, *Euconulus fulvus*, *Vitreo crystallina*, *Nesovitreo hammonis*, *Punctum pygmaeum*, *Carychium tridentatum*, *Spermoea lamellata*, *Vitreo contracta*, *Columella aspera*, *Clausilia pumila* and *Arion rufus*. This relatively rich fauna was unexpected. Interestingly, each species was represented by only a single specimen. In areas with (almost) no undergrowth, no snails could be found.

Slopes to the sea: 5 locations (25, 26, 28, 59, 71)

Slopes toward the sea are often well-covered with herbs, shrubs and trees (loc. 25 and 26). The larger hillsides (some meter's high), however, are subject to erosion (cliffs), and a little bit of water (seepage) ran down their slope in the direction of the sea. The water mass is too small to form a small stream and instead, trickles down the slope disappearing into the sand. Of the 31 species of land snails recorded in this area, some were found only a few times. On one of the slopes (loc. 71), *Helicogona lapicida* was present. This is the only location within our area where this snail was documented. On the other hand, *Carychium tridentatum*, *Cochlicopa lubrica*, and *Aegopinella nitidula*, with low numbers of *Acanthinula aculeata*, *Spermoea lamellata*, *Cochlodina laminata*, *Discus rotundatus*, *Vitreo crystallina* and *Trochulus hispidus* occurred regularly.

High water line on the beach: 5 locations (29, 45, 46, 53, 66)

A particular environment is present as a narrow transition zone from the beach to the land. This zone at Moesgaard is about 1 meter wide and is characterized by marine debris deposited during very high tides (drift litter zone). When this material is

present under vegetation (e.g. rose, *Rosa rugosa* (loc. 45; fig. 8) and sea buckthorn (loc. 29)), a diversity of land snails usually occurs. Amongst the plant remains, seaweed and eelgrass (*Zostera sp.*), hydroids, seashells, etc. 27 species were recorded, including a remarkable number of *Vertigo angustior* (loc. 45; fig. 9). Where the transitional zone entailed beach to slopelands, *Carychium tridentatum*, *Acanthinula aculeata* and *Vertigo pusilla* were present. The presence of these animals was unexpected, since they usually occur in (semi) forested areas. Other unexpected species were also discovered: *Vallonia excentrica* and *Candidula intersecta*, which usually live in open, sparsely vegetated areas and *Vertigo angustior*, which is quite rare in many countries. In fact, *Vertigo angustior* is on the European list of protected species, and on the Habitats Directive. These animals generally live in forests and wooded areas, but here, they are present high on the beach. This discovery is not new; Bondesen (1961) reported *V. angustior* from many such localities on Langeland, and in recent years it is still widely distributed along all coasts of Langeland, and in several other places in Denmark (K. Fog, pers. obs.), partially together with *V. pusilla*. In general *V. angustior* in Denmark lives in widely differing habitats. Lastly, a very small dune was examined, which consisted of a few square meters. The dune featured some grass vegetation and a few docks. It was enclosed by seawater and possibly floods during storm surges. *Candidula intersecta* was the only living snail species discovered on this dune.

Land snails in the surroundings of Moesgaard

From incidental observations it is known that some other species were living a short distance from Moesgaard. While these snails may have also been present within the confines of the research area and were simply missed during investigations, they are not small and would likely have been observed. Such species include The Roman snail *Helix pomatia*, *Cepaea*



Figure 8. High waterline on the beach, south of Fiskerhuset. Under the roses (*Rosa rugosa*), the Red List species *Vertigo angustior* occurs in large numbers (loc. 45) (15-9-2017). Photo: Wim Kuijper

Højvandslinie på stranden, syd for Fiskerhuset. Under roserne forekommer den rødlisterverderede art Skæv vindelsnegl i store tal (lok. 45) (15-9-2017)

nemoralis, *Alinda biplicata* and *Euomphalia strigella*.

CONCLUSION

Moesgaard has a rather rich molluscan fauna. Altogether, circa 51 species were found, and table 1 presents a comprehensive list of these species, most of which are widespread in Northwestern Europe (Denmark). Some of the more common species include *Aegopinella nitidula*, *Discus rotundatus*, *Cochlicopa lubrica*, *Clausilia bidentata*, *Cepaea hortensis* and *Arion* species. Despite often living in wet locations, *Vallonia pulchella* was found only once. Similarly, *Succinella oblonga* (dry conditions) and *Helicigona lapicida* (forest) were also only observed a single time. On the other hand, some rarer snail species were unexpectedly encountered during the research. For example, populations of *Spermodes lamellata* were found at 16 different locations. This small snail (2 mm) is in some regions, e.g. Northwest Germany, a good indicator of ancient, undisturbed moist, beech forest, mostly in coastal areas (Menzel-Harloff, 2013). It is declining in Northwest Europe. The distribution is Northwest Europe and Portugal/Northwest Spain with a center of distribution approximately in Denmark. The situation in Moesgaard is similar to that in North Germany (Menzel-Harloff, 2013), but in Denmark it also occurs commonly inland (K. Fog, pers. comm.). On the beach, along the high watermark, *Vertigo angustior* is present in high numbers at some locations. This small land

snail is also endangered in Europe and on the EU Red List (Habitats Directive, Annex II). Though in Denmark, it still appears to live at many places in calcareous fens and along the beaches. Both *Spermodes lamellata* and *Vertigo angustior*, together with other species, are worth being protected. The richest habitats comprised wetland sites with bushes and trees, as well as forests. Between 33 – 38 species were found living in both environments. Compared with other countries in this part of Europe, the land snail fauna of Denmark is still not very thoroughly investigated to date, with few primary reports. Thus, this investigation not only serves as a much needed addition to Danish malacofauna studies, but it also contributes to the overall research of land snails in Western Europe.

Acknowledgements

I am incredibly grateful to Peter Mikkelsen and colleagues for their kind hospitality at Moesgaard. I am appreciative of Fenna Feijen's help, during some excursions, with the recording of notes and the photographing of fauna and flora at various locations, as well as Ton de Winter and Aart van den Berg's assistance with the identifications of some slugs. Many thanks also to Bent Vestergård Petersen and especially Kåre Fog for providing an introduction to Danish molluscs and providing useful information. Lastly, I would like to note, Fenna Feijen, Inge Kuijper, Carly Henkel and Welmoed Out for their corrections of the English and Danish text.



Figure 9. Hundreds of *Vertigo angustior* in the high waterline on the beach (loc. 45) (15-9-2017).

Photo: Wim Kuijper

Hundredvis af Skæv vindelsnegl ved højvandslinjen på stranden (lok. 45) (15-9-2017)

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Tabel 1. Table 1 Oversigt over indsamlede arter med angivelse af relativ hyppighed på de forskellige habitater.												
0: ingen fundne individer; 0-x: fundet på enkelte lokaliteter i begrænset antal; x: fundet på alle lokaliteter i begrænset antal; 0-xx: fundet på enkelte lokaliteter i antal op til et par dusin; 0-xxx: fundet på enkelte lokaliteter i antal op til mindst hundrede.												
Relative frequency of collected species at Moesgaard.												
0: no individuals; 0-xx: found at a few localities in limited numbers x= found at all localities in limited numbers; xx: found at few localities up to a few dozen individuals; 0-xxx: found at a few localities in hundreds of individuals.												
Habitat			Vædt græsland	Tørt græsland	Mose	Skov-mose	Blandskov	Bøgeskov	Nåleskov	Havskrænt	Strand højvands-mærke	
			Wet grass-land	Dry grassland	Marsh	Carr +	Mixed forest +	Beech forest	Coniferous forest	Slope to sea	High water ridge	
Antal lokaliteter Number of localities			3	3	6	7	11	8	1	5	5	
Lovprove indsamlet: Litter sample: +					+			+ +	+ +	+ +	+ +	
Art Latin sk navn	Art dansk navn	Lokalitetsantal										
Species Latin name	Species Danish name	Number of localities										
<i>Discus rotundatus</i>	Knapsnegl	37	0-x	0	x-xx	x-xx	x-xx	0-x	x	0-x	0-x	
<i>Cochlicopa lubrica</i>	Agatsnegl	35	0-x	0	x-xx	0-x	0-xx	0-x	0	0-xx	0-xx	
<i>Aegopinella nitidula</i>	Rødlig røvsnegl	32	0-x	0	0-x	0-x	0-xx	0-x	0	0-x	0-x	
<i>Clausilia bidentata</i>	Lille foldsnegl	32	0-xxx	0	0-x	0-xxx	0-xxx	0-xxx	0	0-x	0-xx	
<i>Cepaea hortensis</i>	Havesnegl	31	0-xxx	0	0-xx	0-xxx	0-xxx	0-xxx	0	0-x	0	
<i>Carychium triden-tatum</i>	Skov-sandkornsnegl	29	0	0	0-xxx	0-xxx	0-xxx	0-xxx	x	0-xxx	0-xx	
<i>Succinea putris</i>	Almindelig røvsnegl	28	0	0-x	0-xx	xx-xxx	0-xx	0-xxx	0	0-x	0-xx	
<i>Carychium minimum</i>	Eng-sandkornsnegl	28	x-xxx	0	xx-xxx	x-xxx	0-xx	0-xx	0	0-x	0	
<i>Vitrea crystallina</i>	Krystalsnegl	28	0	0	0-x	0-x	0-x	0-x	0	0-x	0-x	
<i>Punctum pygmaeum</i>	Priksnegl	27	0	0	0-x	0-xxx	0-xx	0-x	xx	0-xx	0-xx	
<i>Trochulus hispidus</i>	Håret snegl	26	0-x	0-x	0-x	0-x	0-x	0-x	0	0-x	0-x	
<i>Arianta arbustorum</i>	Kratsnegl	26	0-xxx	0	0-xx	x-xxx	0-x	0-xx	0	0-x	0	
<i>Cochlodina laminata</i>	Glat foldsnegl	25	0	0	0	0	0-xx	0-xx	0-xxx	0	0-x	0-x
<i>Oxychilus cellarius</i>	Kælderrovnsnegl	22	0	0	0-x	0-x	0-x	0-x	0	0-x	0	
<i>Zonitoides nitidus</i>	Glissnegl	22	x-xx	0-x	x-xxx	0-xxx	0	0-x	0	0	0	
<i>Euconulus fulvus</i>	Toppassnegl	21	0	0	0-x	0-x	0-x	0-x	x	0-x	0-xx	
<i>Aegopinella pura</i>	Lille røvsnegl	20	0	0	0-x	0-xx	0-x	0-x	0	0-x	0	
<i>Spermodaea lamellata</i>	Kubesnegl	16	0	0	0	0-xx	0-xx	0-xx	x	0-xx	0	
<i>Clausilia pumila</i>	Sumpfoldsnegl	15	0	0	0	0-xx	0-xx	0-x	x	0-x	0	
<i>Acanthinula aculeata</i>	Kronesnegl	14	0	0	0-x	0-x	0-x	0-x	0	0-x	0-xx	
<i>Nesovitrea hammonis</i>	Ribberovnsnegl	13	0	0	0-x	0-x	0-x	0-x	x	0	0-x	
<i>Oxyloma elegans / O. sarsii</i>	Slank røvsnegl	13	x-xx	0-xxx	0-x	0-x	0-xxx	0-x	0	0-x	0	
<i>Meridigera obscura</i>	Bygkornsnegl	12	0	0	0	0-x	0-xx	0-x	0	0-x	0	
<i>Columella edentula</i>	Valsepuppesnegl	11	0	0	0-x	0-x	0-x	0	0	0	0	
<i>Euconulus alderi</i>	Mosetoppassnegl	10	0-x	0	0-x	0-x	0-x	0-x	0	0-x	0	
<i>Vitrina pellucida</i>	Vinterglassnegl	10	0	0	0	0-x	0-x	0-x	0	0-x	0-x	
<i>Columella aspera</i>	Ru vasepuppesnegl	8	0	0	0-x	0-x	0-x	0	x	0-x	0	
<i>Vertigo substriata</i>	Ribbestribet vindel-snegl	8	0	0	0	0-x	0-x	0-x	x	0	0-x	
<i>Cochlicopa lubricella</i>	Lille agatsnegl	8	0	0-x	0	0	0-x	0-x	0	0	0-xx	
<i>Fruticicola fruticum</i>	Busksnegl	8	0-xxx	0	0-x	0-xxx	0	0	0	0	0	
<i>Vallonia costata</i>	Ribbet græssnegl	6	0	0	0	0	0	0-x	0	0	0-xx	
<i>Vallonia excentrica</i>	Oval græssnegl	5	0	0-x	0	0	0	0	0	0	0-xx	
<i>Vertigo pusilla</i>	Sandskornvindelsnegl	5	0	0	0	0-x	0	0	0	0	0-xx	
<i>Vertigo pygmaea</i>	Græsvindelsnegl	5	0	0	0	0-x	0	0	0	0	0-x	
<i>Vitrea contracta</i>	Lille krystalsnegl	5	0	0	0	0-x	0	0	x	0	0-x	
<i>Cochlicopa sp.</i>	Agatsnegl sp.	4	0	0-xx	0	0	0	0	0	0	0-xx	
<i>Vertigo angustior</i>	Skæv vindelsnegl	3	0	0	0	0	0	0	0	0	0-xxx	
<i>Vertigo antifertigo</i>	Solbærvindelsnegl	3	0	0	0	0-x	0	0	0	0	0	
<i>Candidula intersecta</i>	Pletbåndet solsnegl	3	0	0-xx	0	0	0	0	0	0	0-x	
<i>Oxychilus alliarius</i>	Logsnegl	2	0	0	0	0	0-x	0-x	0	0	0	
<i>Helicigona lapicida</i>	Lampesnegl	1	0	0	0	0	0	0	0	0-x	0	
<i>Succinella oblonga</i>	Lille røvsnegl	1	0	0	0	0	0	0	0	0	0-x	
<i>Vallonia pulchella</i>	Glat græssnegl	1	0	0	0	0	0	0	0	0	0	
Antal arter med hus per habitat		12	7	25	33	29	29	10	25	25		
Number of snail species per habitat												
<i>Arion ater/rufus/ lusitanicus</i>	Skovsnegl/dræbersnegl		0-xxx	0	0-xx	0-x	0-xx	0-x	0	0	0	
<i>Arion ater/Arion rufus</i>	Sort/Rød skovsnegl		0	0	0-x	0	0-xx	0-xx	-	0	0	
<i>Limax maximus</i>	Leopardsnegl/Plettet græsnegl		0	0-x	0	0	0-x	0	-	0	0	
<i>Deroceras reticulatum</i>	Netagersnegl		0-x	0-xx	0	0	0-x	0	-	0	0	
<i>Deroceras laeve</i>	Glagsnegl		0	0	0-x	0	0-x	0	-	0	0	
<i>Limax cinereoniger</i>	Skovpantersnegl		0	0	0	0	0-x	0	-	0	0	
<i>Lehmannia marginata</i>	Bøgesnegl		0	0	0	0	0-x	0-xx	-	0	0	
<i>Arion cf silvicus</i>	Hvidsidesnegl (?)		0	0	0	0	0-x	0	-	0	0	
<i>Arion vulgaris (cf. lusitanicus)</i>	Dræbersnegl		0	0	0	0	0	0	-	0	0-x	
slugs (not identified)	landsnegle (uden hus)	-	0	0	0	0	0-x	0-x	0	0	0	
Antal arter uden hus per habitat			2	2	3	1	9	4	2	0		
Number of slug species per habitat												

Tabel 1. The land molluscs from each habitat.

Landsnegle fundet på de undersøgte habitater.