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Land molluscs in a Dutch river valley wood at Millingen.

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Introduction.

A short distance from the german-dutch border the Rhine branches near the municipality of Millingen, the river Waal then carries most of the Rhine water. The Millingen area was visited on August 22nd 1917 by C. DRUYVESTEIN. On the southern border of the river Waal he collected freshwater molluscs. His locality, a marshy grassland with reeds was situated south of the dam which separates the river Waal and the Pannerdens Kanaal. The card file of the committee for the study of the molluscan fauna of the Netherlands has on record *Lymnaea stagnalis, Radix ovata, Planorbarius corneus* and *Planorbis planorbis* as the species collected by DRUYVESTEIN in 1917. Our party found *Galba truncatula* and *Valvata piscinalis* at the shore of a pool behind the river dike some few hundreds of meters south of DRUYVESTEINS' locality which has changed considerably. Land molluscs were not known from the Millingen area.

On the southern border of the river Waal not far from Millingen, river dunes carry a vegetation which belongs to the Alno-Padion in the terms of phytosociologists; this type of wood is called an "Auenwald" in german literature. This river valley wood consists of a vegetation, which, closest to the river, belongs to the alliance Salicion situated on a slope with northern exposure. At the top of this slope the vegetation changes into the alliance Alnion incanae which at greater distance from the river merges into the sub-alliance Ulmion. This complex is strongly influenced in all its components by many environmental gradients which cause the occurrence of thorn shrubs and other elements belonging to the Prunetalia, also along the skirt of the wood and along a foot path which separates the Salicion part on the slope from the other parts of the complex. Here many river dune plants are growing, among which *Thalictrum minus* is observed frequently at the foot of poplars and *Crataegus* hedges. Many plants are given the chance of growing just here by all kinds of flotsam washed up when the water is high.

To this group of plants, the macrophorbiae or in german "Hochstauden", belong for example *Senecio fluviatilis, Cuscuta europaea, Calystegium sepium* and *Chaerophyllum bulbosum,* which is a very rare species in the Netherlands. On denuded places in the Ulmion as well as in the Alnion incanae elements of the alliance Onopordion appear a. o. *Reseda odorata, Carduus nutans* and *Verbascum nigrum.* At all places where the situation is disturbed by nature

particularly in its wet-dry relation, elements of the Agropyro-Rumicion make their appearance.

This complex wood which is exceptionally rich from a botanical point of view has a rich mollusc fauna with some rare species and one species: *Vitrinobrachium breve* new to the dutch fauna. The record of this species from the vicinity of Arnhem (JAECKEL 1962: 121) is incorrect (SCHLICKUM & THIELE 1962: 169; BUTOT 1964: 461). This new locality fits in the distribution pattern and forms an extension of the known occurrence of this species along the Rhine in Germany. It is hardly possible to venture an opinion as to the problem of dating the actual introduction of *Vitrinobrachium breve* as a new element in the Dutch malacofauna. The locality is very stable, never visited by a malacologist as far as the records available are known to me. The attention of malacologists of our party was drawn to this river valley wood by botanists who knew the very rare plant species *Chaerophyllum bulbosum* to occur at this site at least since 1841 (Prodromus Florae Batavae: 723). The permanent occurrence of a rarity at a certain place is always a signal for something extraordinary in the whole situation. Such sites will produce other rarities when specialists in some other groups are studying the locality.

Some other species of land molluscs living in the river valley wood of Millingen are very rare in the Netherlands e. g. *Truncatellina cylindrica,* others are less rare or not commonly found. The coexistance in one association of *T. cylindrica, Vertigo pygmaea, V. angustior, V. pusilla* and *Laciniaria biplicata* with *Vitrinobrachium breve* is peculiar and worthy of being placed on record.

The malacocenose was studied along the foot path which is at times frequented by cyclists and motorized bicycles. This wood skirt was sampled on June 17th and 19th, July 22nd and 23rd. The site was visited again on September 11th and November 19th, 1964. Samples were taken from 50×50 cm squares. From some squares the upper soil with plant remains was collected and the shells sorted out in the laboratory. Slugs were not collected, however, recognizable species were noted.

In the table the species are arranged in HÄSSLEIN's sets of faithful species (Artenblocks). His system is accepted because his mollusc associations and higher syntaxa are nomenclatorally disconnected from the syntaxa created by phytosociologists. The botanical names are used to give a description of a habitat of which the malacocenose is studied. The malacocenose is recognized and named independantly of the phytocenose. The table lists 22 species of snails; the slugs *Deroceras leave, D. reticulatum, Arion rufus* and *A. circumscriptus* also take part. In the last four columns qualitative data from other samples are given with an indication of the species which this locality has in common with the *Vitrinobrachium breve* occurrences mentioned by HÄSSLEIN (1961) and SCHLICKUM (1949).

The association *Vitrinobrachium breve.*

The association found at Millingen totals 26 species 11 of which are present with sufficient frequency. *Truncatellina cylindrica* should, in my opinion join these 11 species. This, however, could not be actually proved. Its absence in many samples was probably caused by a change in the weather about June 20th.

We then could not rediscover the species not even at the spots where it had been taken alive on June 17th and 19th. FRENTROP (1964) is also of the opinion that this species is less rare in the dry river grassland vegetations than is generally supposed. It is found in April in flotsam along the river shore. In the Netherlands this is a subterranean species, climbing vegetation on rainy days after lasting high temperatures. We would have missed this species if we had not visited this site some days before June 20th.

Vitrinobrachium breve could be found only with difficulty in June. Empty shells had been discovered by Mr. J. BROUWER in his samples. I gratefully acknowledge his cooperation and permission to incorporate his samples in my table. When finding living juveniles they had been taken for *Eucobresia diaphana* known from Ubbergen and refound by our party some days before at the classical locality. This determination was however, doubted from the beginning because of great differences in the two habitats. Mr. NEUTEBOOM suggested afterwards with reference to SCHLICKUM (1962) that the suspected juvenile snails might belong to *Vitrinobrachium breve*. This suggestion could be checked when the author had collected adult specimens in September and November. Stretched specimens showed after dissection the characteristic genitalia of this species. Although *V breve* could be found only with difficulty in June and July the species proved to dominate this association in November. On a rainy day (November 17th) the species was observed crawling freely in numbers on stones, wood and fallen dead leaves along the *Crataegus* hedge and row of poplars as well as in the Salicion vegetation on the slope. In the Alnion sites of this locality the species was also found, although incidentally. In the Salicion part of the slope about every third to fifth specimen was found in copulation on November 17th.

Arianta arbustorum was present in some few samples as an empty juvenile shell. The adults were regularly seen at a higher level and this also applies to *Cepaea nemoralis* and *C. hortensis*. The identification of the latter species was based on the love dart. The specimen is large and was at first listed as *C. nemoralis* in a white lipped form. Both species are in HÄSSLEIN's "Artenblock" of warm and open woods.

The occurrence of *Aegopinella nitidula* was restricted to the surroundings of a farmhouse under rubbish. *Vallonia excentrica* was present as empty shells only. *Carychium minimum* occurred in one sample as two dead juveniles. *Euconulus fulvus* is very scarce in the samples. *Zonitoides nitidus* appeared only in a sample which does not belong to the series. These gastropods will prove to have their optima at other places in this complex wood.

Discussion.

HÄSSLEIN (1961) described and named the "*Vitrinobrachium breve* Gesellschaft feuchtwarmer Wälder der Stromaue" from moist river valley woods south of Bonn viz. from a moist Oak-Hornbeam plot at Mehlem, from a Willow-Poplar wood fragment on the island of Grafenwerth and from an Elm wood remnant on the island of Nonnenwerth Nord. Some species of the association do not occur in the river valley wood in the Millingen area. Of these

species *Laciniaria plicata* belongs to the faithful set of two species which should define the lowest syntaxon. Other species which are lacking are *Phenacolimax major, Cochlodina laminata, Helix pomatia* and *Deroceras agreste*. They belong to HÄSSLEIN'ian syntaxa of higher rank. Their absence may be explained probably on zoogeographical grounds, they however join other species which also do not occur as they are rather strongly connected with Carpinion wood conditions: e. g. *Monachoides incarnata* and probably also *Aegopinella pura* and *Acanthinula aculeata*. A closer study of the Ulmion parts of this river valley wood, interwoven with *Alnion incanae* elements might bring these three species to light.

Vertigo pusilla, Oxychilus cellarius, Columella edentula, Arianta arbustorum and *Aegopinella nitidula* form the faithful species of the order and alliance constituting the HÄSSLEIN'ian set of faithful species (Artenblock) of molluscs of moist and damp woods in mountainous and lowland regions. It is curious that *Discus rotundatus* which is a very common species in the Netherlands and certainly belongs to the „Artenblock" which constitutes the HÄSSLEIN'ian Class: "Inhabitants of deciduous woods" did not turn up so far in this association. Of this group of faithful species *Laciniaria biplicata* is the only representative in this river valley wood.

Trichia striolata (C. PFEIFFER) which is also a characteristic species of river valley woods (SCHLICKUM 1949; SCHLICKUM & THIELE 1962: 171) did not turn up in the Millingen-association. This species was not mentioned as a participant in the association *Vitrinobrachium breve* by HÄSSLEIN (1961). Although the faunal composition of this complex wood was not particularly studied in every part of the wood, the result of the study of this association agrees in every respect with the opinion which botanists of the State Institute of Nature Conservation Research (RIVON) have formed about the structure of this wood outlined in the introduction of this paper.

The association is relatively rich in small and rare species which make very different demands as to the temperature and moisture. Warmth and light present favourable circumstances for the two *Cepaea* species, but do not prevent, however, the occurrence of the cold-, wet- and shade-loving *Arianta arbustorum*. The species from dry surroundings: *Truncatellina cylindrica, Vertigo pygmaea, Vallonia excentrica* associate with the species from damp to moist and wet biotopes e. g. *Succinella oblonga, Vertigo augustior, Deroceras laeve, Zonitoides nitidus* and *Carychium minimum. Truncatellina cylindrica, Vertigo angustior* and *Vitrinobrachium breve* most probably belong to the important molluscs of this association as they indicate the extreme possibilities offered in this locality with regard to temperature and moisture which form permanent gradients *Vitrinobrachium breve* requires "less" for temperature, "more" for moisture. *Vertigo augustior* and probably *Laciniaria biplicata* also require "more" for temperature and moisture while *Truncatellina cylindrica* requires "more" for temperature, "less" for moisture.

The existing gradients do not primarily result in local differences, but the more so in slight and constant periodic variations of these factors in time which also result in stabilization of a differentiated biotope of environmental gradients. These biotopes will immediately collapse if unusual variations are allowed to occur.

From the structure of the vegetation and malacofauna in this locality it is clear that it belongs to a group of biotopes of great stability which means that the status quo achieved by nature will be maintained only if no new influences are introduced.

In the description of the Association *Vitrinobrachium breve* HÄSSLEIN (1961) remarks that all river valley woods inhabited by *V. breve* have been and are anthropogenically disturbed. The vegetations are threatened by camping and bathing. The dutch locality is also endangered.

Recreation activities in such sites interfere with the natural periodicity which plays its part in the gradients. Alteration will destroy the stability of the actual variation by influencing the gradients in many ways. An alteration of the existing situation by unwanted visitors without doubt will result in a monotony of stinging nettles. HÄSSLEIN (1961) noticed the occurrence of stinging nettle jungles which form a welcome protection from campers and bathers. Although nettles are "at home" in river valley woods, the predominance of this species may be a token of an unwanted variation in time, that has already taken place.

References.

BUTOT, L. J. M. (1964): Een nieuwe mollusk *(Vitrinobrachium breve)* voor de Nederlandse Fauna. — Corr. Bl. nederl. malac. Ver., 111: 1161.

FRENTROP, J. (1964): Weekdieren in de Lijmers. — De Levende Natuur, 67: 227-235, 253-258.

HÄSSLEIN, L. (1961): Die Molluskenfauna des Siebengebirges und seiner Umgebung. — Decheniana, Beih. 9: 1-28.

JAECKEL, S. G. A. (1962): Ergänzungen und Berichtigungen zum rezenten und quartären Vorkommen der Mitteleuropäischen Mollusken. — In P. BROHMER: Die Tierwelt Mitteleuropas, 2 (1) Ergänzungen.

LEEUWEN, C. G. VAN & DOINGKRAFT, H. (1959): Landschap en beplanting in Nederland. H. VEENMAN & ZONEN N. V., Wageningen 88 pp. geill.

Prodromus Florae Batavae, vol. 1 pars 2 editio altera. Nijmegen 1902: 723.

SCHLICKUM, W. R. (1949): *Vitrina (Vitrinobrachium) brevis* am Niederrhein. — Arch. Moll., 78: 61-62.

SCHLICKUM, W. R. & THIELE, H. U. (1962): Zur Molluskenfauna des Rheinlandes. — Arch. Moll., 91: 167-172.

The association *Vitrinobrachium breve* in a River Valley Wood at Millingen. Species arrangement in "Artenblocks" (HÄSSLEIN 1961) P = present x = mentioned by	Names of species	Quantitative samples from 50×50 cm squares															Non. quant. samples		Litt.	
		17. 6. 1964. B.	19. 6. 1964. B.	19. 6. 1965. 1	19. 6. 1964. 2	19. 6. 1964. 3	19. 6. 1964. 4	22. 7. 1964. 1	22. 7. 1964. 2	23. 7. 1964. 1	23. 7. 1964. 2	23. 7. 1964. 3	23. 7. 1964. G1	23. 7. 1964. G2	23. 7. 1964. 0	11. 9. 1964.	22. 7. 1964.	17. 11. 1964.	HÄSSLEIN 1961	SCHLICKUM 1949
Faithful species of Association: Molluscs of moist and warm River Valley Woods:	*Vitrinobrachium breve*	7	2	5	—	3	30	1	9	9	2	1	—	5	3	1	P	P	×	×
Alliance: Molluscs of woods and scrubs in lowlands:	*Arianta arbustorum*	—	—	—	—	—	—	—	6	—	—	1	—	1	1	—	P	P	×	×
Order: Molluscs of moist and damp woods in mountainous and lowland regions:	*Vertigo pusilla*	8	5	1	1	3	14	10	20	8	—	30	63	21	37	3	P	—	—	—
	Oxychilus cellarius	6	5	—	1	2	2	2	2	12	—	4	11	6	7	10	—	—	×	—
	Columella edentula	—	1	—	—	—	5	—	—	2	—	8	11	—	—	1	—	P	—	—
	Aegopinella nitidula	—	—	11	30	—	—	—	—	—	—	—	—	—	—	—	—	—	×	—
Class: Molluscs of deciduous woods:	*Laciniaria biplicata*	9	3	1	—	9	15	10	15	19	3	4	9	24	17	3	P	P	×	×
Transgradient species from Warm and open woods and thickets:	*Cepaea nemoralis*	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1	P	—	×	×
	Cepaea hortensis	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1	P	P	×	×

Grasslands:																				
	Vertigo pygmaea	1	6	—	—	5	6	3	4	—	—	3	10	—	6	—	—	—	—	×
	Succinella oblonga	7	2	—	—	3	13	—	5	6	4	1	2	47	2	9	P	—	—	×
Damp and dry grasslands:	*Truncatellina cylindrica*	1	—	1	—	3	11	—	—	—	—	—	—	—	—	—	—	—	—	—
	Vallonia excentrica	—	—	6	—	—	—	—	1	1	—	—	—	—	—	—	—	—	—	—
	Deroceras reticulatum	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	P	P	—	—
Moist and wet grasslands:	*Deroceras laeve*	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	P	—	—
	Vertigo augustior	—	—	—	—	—	—	7	6	—	—	9	5	3	1	—	—	—	—	—
	Carychium minimum	—	—	—	—	—	—	—	2	—	—	—	—	—	—	—	—	P	—	×
	Zonitoides nitidus	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	P	—	×	×
Species common in various habitats:	*Trichia hispida*	9	2	3	2	7	3	—	4	3	8	2	3	3	3	9	P	—	×	×
	Vitrina pellucida	9	1	1	—	11	89	21	17	14	10	11	11	47	125	6	P	P	×	×
	Punctum pygmaeum	9	3	1	3	1	39	2	2	3	—	10	46	20	74	—	P	—	—	—
	Cochlicopa lubrica	5	3	—	—	—	26	3	23	21	4	2	6	10	17	16	P	P	×	×
	Vallonia costata	41	—	—	—	10	69	5	8	7	14	1	1	—	30	10	P	—	×	—
	Euconulus fulvus	—	2	—	—	—	—	1	—	—	—	—	—	—	—	—	P	P	—	—
	Arion rufus	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	P	—	—	—
	Arion circumscriptus	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	P	—	—	—