

# BASTERIA

TIJDSCHRIFT VAN DE NEDERLANDSE  
MALACOLOGISCHE VERENIGING

## Bibliography of Radulae Figures of the British and Dutch Non-marine Mollusca

by

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Next to the study of shells the interest in the animals of the Mollusca and their interior parts is increasing rapidly. Not only are the beauty of the unexpected colours and the surprising variety of structure a never-ending source of intense enjoyment, but these studies are furnishing reliable characters for the more exact determination of the species.

In the seventeenth and eighteenth centuries it was already known that Mollusks possessed a radula as well as a mandibula, but owing to the lack of suitable magnifying instruments it was not possible to observe even the gross structure accurately, let alone to depict their detailed structure.

One of the first — perhaps even the very first — naturalists who occupied themselves with the study of radulae was the dutch scholar JAN SWAMMERDAM (1637—1680). He presented only two of his works — "Historia insectorum generalis" and "Ephemeris Vita" — to the public during his lifetime and not until 1737 were his many other notes collected together (including the above mentioned) and published by BOERHAAVE under the title "De Bybel der Natuure". In this work the author speaks of the radulae of *Helix pomatia*, *Limnaea* sp. and *Paludina vivipara*. Of the last-mentioned he remarks that it is made so fine that it is as impossible to describe it as to depict it. He also mentions the radulae of *Neritina fluviatilis* and of a dutch representative of the genus *Littorina*, and of these he gives figures, in which he shows the situation of the radula in the pharynx.

In 1809 and 1826 Vols I to III of SAVIGNY'S "Description de l'Egypte" were published and in 1832 QUOY and GAIMARD published their "Voyage de l'Astrolabe". Figures of the radulae of a number of marine molluscs were given in both of these works.

The first summarising work on this subject — in which work the author attempted a systematic classification of the mollusca based

upon their radular structure — was F. H. TROSCHER'S "Das Gebiss der Schnecken zur Begründung einer natürlichen Classification" — of which the first part was published during 1856—1863 and the second part (completed by J. THIELE) during 1866—1893. By far the greater part of the radulae in this work are those of marine molluscs; only a few operculates are depicted among the land and fresh-water species.

Since the publication of these very many figures have appeared in the literature, but unfortunately many of these, more especially the older ones, are inaccurate. This is particularly the case in the pioneer work of LEHMANN published in 1873.

The first trustworthy figures of radulae of non-marine mollusca are to be found in the publication of LOVEN in the *Oefversigt af Kongliga Vetenskaps-Akademiens Förhandlingar* (Stockholm) for 1847, and in a paper of THOMPSON (67) based on it in the *Annals and Magazine of Natural History* of 1851.

In recent years the interest in the study of radulae of the non-marine molluscs appears to be growing amongst the younger malacologists both in England and the Netherlands, and because they know of no other attempt at a bibliography the authors feel that this present compilation may be of some use to those who have found it tedious searching for the very scattered literature. The authors have restricted their notes to the most accessible works and papers.

This paper is based on the unpublished "Bibliography of Radulae Figures of the British Non-marine Mollusca", compiled by BERNARD VERDCOURT as the final part of his series on the radulae of the British snails published in *The Microscope*, London, during 1946—1949, and the nomenclature follows that of the List of Dutch Mollusca by T. VAN BENTHEM JUTTING in *Basteria*, Vol. 11, 1947, without intending to set aside the very valuable "Notes on a List of the British Non-marine Mollusca" by HUGH WATSON in the *Journal of Conchology*, Vol. 22, 1943. Those species found in the Netherlands but not in Britain have been added.

Where a species which occurs in Britain or in the Netherlands is not included in the list, no reliable radula figures have been found.

Bibliographies are always dry reading and this one has been compressed into as small a space as possible. In certain cases page and plate references have been added where the work referred to is not adequately indexed.

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## SYSTEMATIC LIST

## Classis Gastropoda

## Subclassis Prosobranchia

## Ordo Archaeogastropoda

## Familia Neritidae

- Theodoxus fluviatilis* (Linné) 6, f. 12; 19; 21; 34, f. 94; 37, pl. 6;  
64, 1, p. 294; 70, 1, f. 1, 2.

## Ordo Mesogastropoda

## Familia Viviparidae

- Viviparus lacustris* Beck <sup>1)</sup> 6, f. 15; 34, f. 85; 70, Xa, f. 1—5.  
*Viviparus viviparus* (Linné) <sup>2)</sup> 34, f. 84; 64, 1, p. 265; 70, Xb, f.  
6—9.

## Familia Valvatidae

- Valvata cristata* Müller 34, f. 93; 69, pl. 6 f. 15; 70, XI, f.  
5a, c—g.  
*Valvata macrostoma* Mörch 34, f. 92; 70, XI, f. 3.  
*Valvata piscinalis* (Müller) 6, f. 34; 7, pl. 12, f. 8; 42; 69, pl. 6  
f. 13; 70, XI, f. 1, 2, 4, 5b.

## Familia Pomatiasidae

- Pomatias elegans* (Müller) 6, f. 33; 12; 23a; 26, pl. VI e; 59,  
p. 172 (after Troschel); 69, pl. 4 f.  
8; 70, III, f. 4—8.

## Familia Acmididae

- Acme fusca* (Montagu) 70, IV, f. 1—4.

## Familia Hydrobiidae

- Hydrobia stagnalis* (Baster) 6, f. 62; 70, VII, f. 3, 5a, 7a, 8a, c,  
(= *H. ventrosa* Mont.) 9a, b, c, 10a; 80.  
*Hydrobia ulvae* (Penn.) 6, f. 58; 70, VI.  
*Marstoniopsis steinii* (v. Martens) 6, f. 68; 32, f. 10; 35, pl. 3 f. 9; 53,  
(= *Hydrobia scholtzi* Schm., f. 2; 70, VIII, f. 7—11.  
(= *Amnicola taylori* Smith)

<sup>1)</sup> = *Vivipara contecta* (Millet) = *Viviparus fasciatus* auctt. angl.: The species with pointed apex and shouldered whorls.

<sup>2)</sup> = *Viviparus fasciatus* (Müller) = *V. viviparus* auctt. angl.: The species with more obtuse apex and rounded whorls.



- Potamopyrgus jenkinsi* (Smith) 6, f. 65; 70, VII, f. 4, 5b, 6, 7b, 8b, d, 9c, 10b; 80.  
*Amnicola confusa* Frauenfeld - 24, f. 641; 70, VIII, f. 1—5.  
 (= *Pseudamnicola similis* Drap.)  
*Litboglyphus naticoides* (Férussac) 6, f. 55; 24, p. 657, f. 723.  
*Bithynia tentaculata* (Linné) 23, f. 498; 26, pl. VII f. 1; 34, f. 86; 35, pl. 3 f. 9; 69, pl. 7 f. 8; 70, IX, f. 1—12.  
*Bithynia leachii* (Sheppard) 34, f. 87; 35, pl. 2 f. 13; 70; IX.

## Familia Assimineidae

- Assimineea grayana* Fleming 6, f. 50; 23, f. 507; 59, f. 179; 66, p. 115, f. 1; 69, pl. 7 f. 13; 70, V, f. 1—6, XII, f. 3; 73, p. 976.

## Subclassis Pulmonata

## Ordo Basommatophora

## Familia Ellobiidae

- Carychium minimum* Müller <sup>1)</sup> 6, f. 121; 43, f. 16.  
*Phytia myosotis* (Draparnaud) 6, f. 124; 10; 43, f. 22.

## Familia Physidae

- Aplexa hypnorum* (Linné) 6, f. 155; 34, f. 71.  
*Physa fontinalis* (Linné) 10; 20, f. 141c; 26, pl. VII m; 34, f. 70; 53, 1, p. 268.  
*Physa acuta* Draparnaud 6, f. 151; 23, f. 275.

## Familia Lymnaeidae

- Lymnaea truncatula* (Müller) 34, f. 66.  
*Lymnaea glabra* (Müller) 15; 46.  
*Lymnaea palustris* (Müller) 1; 34, f. 68.  
*Lymnaea auricularia* (Linné) 1; 34, f. 64.  
*Lymnaea pereger* (Müller) <sup>2)</sup> 15; 34, f. 65.  
*Lymnaea stagnalis* (Linné) 1; 6, f. 159; 10; 20, f. 141a (highly inaccurate); 25, p. 42; 26, pl. VII k; 34, f. 67; 65, f. 569; 73.  
*Lymnaea catascopium* (Say) 1; 36.  
*Myxas glutinosa* (Müller) 6, f. 167; 34, f. 69.

<sup>1)</sup> The radulae of the two forms occurring in Britain will be figured in the paper which is being prepared by H. WATSON and B. VERDCOURT.

<sup>2)</sup> It is not certain yet whether *Lymnaea ovata* Drap. is a variety of *L. pereger* (Müll.) or not. Both forms occur in Britain as well as in the Netherlands and the figures refer to either. The radulae do not in any case differ in any way.

## Familia Planorbidae

<i>Planorbis corneus</i> (Linné)	2; 6, f. 134; 10; 23, f. 269; 24, f. 525; 34, f. 72; 57; 64, 1, p. 270.
<i>Planorbis planorbis</i> (Linné)	2; 6, f. 136; 10; 34, f. 73; 57.
<i>Planorbis carinatus</i> Müller	34, f. 73 B; 67, pl. IV f. 9—11.
<i>Planorbis dilatatus</i> Gould	2.
<i>Planorbis vortex</i> (Linné)	24, f. 534A; 34, f. 75; 57.
<i>Planorbis spirorbis</i> (Linné)	2; 10; 34, f. 76; 57.
<i>Planorbis albus</i> Müller	2; 10; 24, f. 544; 34, f. 78; 57.
<i>Planorbis contortus</i> (Linné)	2; 10, 24, f. 531; 34, f. 74; 57.
<i>Planorbis crista</i> (Linné)	34, f. 79; 42, p. 31.
<i>Planorbis laevis</i> Alder	44a, f. 15.
<i>Planorbis complanatus</i> (Linné)	34, f. 80; 42, p. 32.
<i>Segmentina nitida</i> (Müller)	2; 34, f. 81.

## Familia Ancyliidae

<i>Ancylus fluviatilis</i> Müller	6, f. 127; 20, f. 141B; 24, f. 588; 26, pl. VII n; 34, f. 82; 40, pl. 35 f. 13—15; 44a, f. 17; 74, pl. II f. 3.
<i>Acroloxus lacustris</i> (Linné)	6, f. 129; 10; 24, f. 583; 34, f. 83; 74, pl. II f. 2.

## Ordo Stylommatophora

## Familia Oncidiidae

<i>Oncidiella celtica</i> (Cuvier)	24, f. 468; 33; (see also 77).
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## Familia Succineidae

<i>Succinea</i> (spp.)	Figures will be found in 34; 35; 59, but the only reliable ones are in 6, f. 204 ( <i>Succinea oblonga</i> Drap.), and 51 ( <i>Succinea putris</i> L., <i>oblonga</i> Drap., <i>arenaria</i> Bgt. and <i>pfeifferi</i> Rossm.). See also 23, f. 261.
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## Familia Testacellidae

<i>Testacella maugei</i> Férussac	64, 2, f. 34—35.
<i>Testacella haliotidea</i> Draparnaud	23, f. 234; 64, 1, f. 535, 2, f. 10—11; 65, f. 652.
<i>Testacella scutulum</i> G. B. Sowerby	64, 2, f. 23—24.

## Familia Cochlicopidae

<i>Cochlicopa lubrica</i> (Müller)	6, f. 170; 8; 9; 34, f. 44; 41, f. 79—82; 59; 67.
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## Familia Vertiginidae

- Cotumella edentula* (Draparnaud) 6, f. 191; 27; 34, f. 49; 49, 2, p. 1001, f. 534; 59; 60, f. 36.  
*Truncatellina cylindrica* (Férussac) 6, f. 193; 34, f. 47; 44; 60, f. 35.  
*Vertigo moulinsiana* (Dupuy) 22, f. 18; 30; 59; 60, f. 32—33; 68.  
*Vertigo liljeborgi* Westerlund 68.  
*Vertigo antivertigo* (Draparnaud) 34, f. 52.  
*Vertigo pygmaea* (Draparnaud) 34, f. 53.  
*Vertigo pusilla* Müller 6, f. 179; 34, f. 54.  
*Vertigo angustior* Jeffreys 34, f. 55.  
*Pupilla muscorum* (Linné) 6, f. 195; 34, f. 50; 41; 59; 60, f. 30—31.  
*Lauria cylindracea* (Da Costa) 6, f. 197; 34, f. 48; 60, f. 29.  
*Abida secale* (Draparnaud) 6, f. 187; 60, f. 26.  
*Chondrina avenacea* (Bruguière) 6, f. 189.

## Familia Valloniidae

- Acanthinula aculeata* (Müller) 6, f. 172; 13; 34, f. 32.  
*Acanthinula lamellata* (Jeffreys) 13; 34, f. 25.  
*Vallonia* spp. Figures in: 8; 34; 41; 64, but reliable ones only in: 6, f. 175 (*V. pulchella* Müll.); 13; 49, 2, p. 1020, f. 543A and B (*V. pulchella* Müll. and *V. costata* Müll.); 63 (*V. pulchella*, *costata* and *excentrica*); and 75.  
*Pyramidula rupestris* (Draparnaud) 13; 16; 48; 50, pl. IV f. 14—15; 64, f. 226, 556; 75, f. 4a.

## Familia Enidae

- Ena obscura* (Müller) 6, f. 201; 34, f. 45; 47; 59.  
*Ena montana* (Draparnaud) 26, pl. VI f. 47.

## Familia Clausiliidae

- Clausilia dubia* Draparnaud 34, f. 58.  
*Clausilia buplicata* (Montagu) 6, f. 255; 26, pl. VI f. 9; 34, f. 61.  
*Clausilia laminata* (Montagu) 34, f. 62.  
*Balea perversa* (Linné) 59.

## Familia Eulotidae

- Eulota fruticum* (Müller) 6, f. 267; 34, f. 38; 39, p. 135.

## Familia Helicidae

- Helicella unifasciata* (Poiret) 6, f. 269.  
 (= *H. candidula* Studer)

- Helicella caperata* (Montagu) 11.  
*Helicella beripensis* (Mabille) See: Journ. of Conch., Vol. 14, 165.  
*Helicella virgata* (Da Costa) 11; 64, 4, f. 235—237.  
*Helicella ericetorum* Müller 11; 64, 4, f. 179—180.  
 (= *H. itala* L.)  
*Helicella neglecta* (Draparnaud) 64, 4, f. 214—215.  
*Helicella* (*Trochoidea*) *elegans* (Gmelin) 49, 1, p. 15, f. 8a.  
*Cochlicella acuta* (Müller) 11.  
*Euparypha pisana* (Müller) 24, f. 152; 64, 3, f. 416—418.  
*Theba carusiana* (Müller) 13; 64, 4, f. 150—151.  
*Theba cantiana* (Montagu) 6, f. 275; 11; 64, 4, f. 117—118.  
*Ashfordia granulata* (Alder) 11; 64, 4, f. 106—107.  
*Monacha incarnata* (Müller) 6, f. 278; 76.  
*Fruticicola hispidata* (Linné) 6, f. 282; 11; 13a, p. 275; 34, f. 35; 64, 4, f. 34—36.  
*Fruticicola striolata* (Pfeiffer) 8; 11; 64, 4, f. 17—18.  
*Fruticicola subvirescens* (Bellamy) 11; 64, 4, f. 53—54.  
*Hygromia limbata* (Draparnaud) 76.  
*Hygromia cinctella* (Draparnaud) 76.  
*Hygromia subrufescens* (Müller) 13; 64, 4, f. 74—75.  
*Helicodonta obvoluta* (Müller) 6, f. 286; 13; 64, 4, f. 88—89.  
*Helicigona lapicida* (Linné) 6, f. 288; 13; 34, f. 28; 64, 3, f. 461—462.  
*Arianta arbustorum* (Linné) 6, f. 290; 13; 34, f. 29; 64, 3, f. 479—481.  
*Cepaea nemoralis* (Linné) 6, f. 293; 13; 34, f. 39; 64, 3, f. 336—337.  
*Cepaea hortensis* (Müller) 8; 9; 13; 34, f. 41; 35; 64, 3, f. 383—388.  
*Helix aspersa* Müller 8; 13; 28; 64, 1, f. 522—525, 3, f. 316—317.  
*Helix pomatia* Linné 6, f. 297; 13; 20, f. 140B; 26; 34, f. 41—42; 38; 64, 3, f. 290—292.

## Familia Ferussaciidae

- Cecilioides acicula* (Müller) 6, f. 250; 34, f. 43; 58; 67, 72b, f. 24—26; 78, textf. 6.

## Familia Endodontidae

- Punctum pygmaeum* (Draparnaud) 6, f. 263; 13; 35, pl. 3 f. 12; 54; 64, 1, f. 542.  
*Goniodiscus rotundatus* (Müller) 6, f. 265; 13; 22, f. 7; 34, f. 27; 59; 64, 3, f. 239.

## Familia Zonitidae

- Vitrea crystallina* (Müller)<sup>1)</sup> 6, f. 235; 34, f. 21; 55; 64, 3, f. 148—149; 72a, f. 1B.
- Retinella hammonis* (Ström)  
(= *R. radiatula* Alder) 3, pl. 13, f. 3; 55; 64, 3, f. 132—134; 67.
- Retinella nitens* (Michaud) 55.
- Retinella pura* (Alder) 8; 34, f. 20; 55; 64, 3, f. 122, 124.
- Retinella nitidula* (Draparnaud) 6, f. 237B; 20, f. 140A; 34, f. 18; 55; 64, 3, f. 109—112; 71, f. 2; 72a, f. 1C.
- Oxychilus draparnaldi* (Beck)  
(= *O. lucidus* Drap.) 55; 64, 3, f. 44—45.
- Oxychilus cellarius* (Müller) 6, f. 237C; 8; 12; 22, f. 8; 26; 34, f. 16; 35, pl. I f. 8; 49, II, p. 247, f. 122b; 55; 56; 64, 3, f. 66, 530—535.
- Oxychilus alliaris* (Miller) 17; 34, f. 17; 37, pl. 5; 55; 64, 1, p. 264; 3, f. 98—99; 79.
- Oxychilus helveticus* (Blum)  
(= *O. rogersi* Woodward) 12; 16a; 17; 55; 64, 3, f. 74—77, 540—542; 72a, f. 1, D; 79.
- Zonitoides nitidus* (Müller) 6, f. 244; 8; 34, f. 23; 49, II, p. 475, f. 258 b; 55; 64, 3, f. 195—196.
- Zonitoides excavatus* (Bean) 55; 64, 3, f. 187—188; 72a, f. 1, A.

## Familia Vitrinidae

- Vitрина pellucida* (Müller) 6, f. 230; 14; 34, f. 12; 64, 3, f. 5—9.
- Vitрина major* (Férussac) 14.
- Vitрина pyrenaica* (Férussac) 64, 3, f. 529.

## Familia Arionidae

- Arion ater* (Linné) 26; 34, f. 1; 45, f. 8—9; 52; 59; 64, 2, f. 199—200.
- Arion subfuscus* (Draparnaud) 8, p. 224, pl. 5 f. C; 45, f. 16—18; 64, 2, f. 214—215.
- Arion circumscriptus* Johnston 45, f. 24—25; 49, II, p. 669, f. 364A; 64, 2, f. 238—239.

<sup>1)</sup> Because *Vitrea contracta* Westerlund is only considered a variety of *V. crystallina* (Müller) in England, it is not certain, to which our references are concerned.

- Arion hortensis* Férussac 6, f. 212; 8; 26; 34, f. 4; 45, f. 37—39; 64, 2, f. 226—227.  
*Arion intermedius* Normand 45, f. 44—45; 64, 2, f. 248—249.  
*Geomalacus maculosus* Allman 6, f. 218; 64, 2, f. 267—269.

## Familia Limacidae

- Milax gagates* (Draparnaud) 8, p. 150, pl. 1 f. J; 24, f. 52; 47a; 56; 64, 2, f. 163—164.  
 (= *Limax lewstoni*)  
*Milax rusticus* (Millet) 53a, f. 3.  
*Milax sowerbyi* (Férussac) 26, pl. IV f. 3; 29; 47a; 64, 2, f. 176—177.  
*Milax gracilis* (Leydig) 47a.  
*Limax maximus* Linné 6, f. 220; 8; 26, pl. IV f. 1; 29; 34, f. 6; 37, pl. 4; 64, 2, f. 54—55; 72, f. 1.  
*Limax cinereoniger* Wolf 35, pl. 1 f. 1; 59; 64, 2, f. 79—80.  
*Limax flavus* Linné 8, pl. 1 f. G; 34, f. 5; 64, 2, f. 103.  
*Limax tenellus* Müller 34, f. 9; 35, pl. 1 f. 2; 59; 64, 2, f. 90—91.  
*Lebmannia marginata* (Müller) 6, f. 225; 34, f. 7; 59; 64, 2, f. 111—112.  
*Agriolimax reticulatus* (Müller)  
*Agriolimax agrestis* (Linné)<sup>1</sup> 8; 26, pl. V f. 4; 29; 34, f. 8; 35, pl. 1 f. 3; 59; 64, 2, f. 126.  
*Agriolimax laevis* (Müller) 4, pl. XI f. 1; 6, f. 226; 8, p. 149, pl. 1 f. 1; 34, f. 10; 49, II, p. 540, f. 289D, E; 63, p. 389, pl. 10 f. I—V (sub *Limax campestris*); 64, 2, f. 135—136.

## Familia Ariophantidae

- Euconulus trochiformis* (Montagu) 5, p. 49; 6, p. 248; 8; 9; 34, f. 24; 35, pl. 1 f. 6; 49, II, p. 235, f. 116a; 55; 64, 3, f. 162, 172; 72a, f. 1, E.

<sup>1</sup>) With all reserve we give these figures. Save in recent years *A. reticulatus* and *A. agrestis* have not been differentiated.