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Xerotracha conspurcata
from Cadzand-Bad,
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Xerotricha conspurcata (Draparnaud, 1801), a new species for The Netherlands (Gastropoda, Pulmonata, Hygromiidae)

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For the first time the hygromiid species *Xerotricha conspurcata* was found in The Netherlands. Initially in 2016 only one live specimen was collected in Cadzand-Bad, province of Zeeland, but in 2017 the existence of a population nearby was confirmed. This population lives predominantly on concrete walls bordering the private parking lot of an Italian restaurant. The mild climate in the Netherlands, particularly close to the North Sea coast, and the ongoing climate change may have enabled the survival of this population in Zeeland.

Key words: Pulmonata, Hygromiidae, *Xerotricha conspurcata*, Cadzand-Bad, first record, Netherlands.

INTRODUCTION

On 11.ix.2016, in the land-facing dune area northwest of Boulevard De Wielingen in Cadzand-Bad, the first author collected one live specimen of an unknown land snail species. On morphological and anatomical grounds the species was eventually determined as *Xerotricha conspurcata* (Draparnaud, 1801) (Fig. 1). The snail had been found in shady rough herbage, under dead timber. Because only one specimen had been found it was important to establish whether a popula-

tion occurred at that site. On 7.x.2017 the existence of a population was confirmed, but in a place different from where the first specimen was collected.

DESCRIPTION OF *XEROTRICHA CONSPURCATA*

Shell. – The shell is wider than high, globular, with a flattened apex (Fig. 2d, e). The shells of fully grown specimens, with 4-5 whorls, have a width of 5-6.5 mm and a height of 3-4 mm. The whorls are separated by a shallow suture. The last whorl of juvenile specimens is somewhat angular. The aperture of adults is oval, slightly broader than high. The margin of the aperture is sharp and there is no internal thickening. At the umbilicus, the margin of the aperture is slightly reflected and partly covers the umbilicus. The umbilicus occupies approximately 1/6th of the shell diameter (Fig. 2f). The shell sculpture consists of irregular fine ribs and growth lines.

The shell is light brown with cream-white elongated radial spots. On the upper side, the spots often cover the full width of the whorl, forming a pattern of radial stripes in parallel to and over the sculpture. On the lower side, the spots constitute four or five interrupted narrow spiral bands.

On both the upper and lower side, shells of juvenile as well as adult live animals are covered with 0.2-0.3 mm long, curved hairs which radiate in all



Fig. 1. Live specimen of *Xerotricha conspurcata* from Cadzand-Bad, The Netherlands. Photograph by Stef Keulen.

directions (Fig. 2d-f). Shells may show scars at spots where hairs were abraded (Kerney & Cameron, 1980). According to Welter-Schultes (2012) hairs may also be absent from the shells of fully grown living specimen.

Soft parts. – The body colour varies from very light cream-white to almost black. The back and the head of the snail are always darker than other parts of the body and usually very dark brown. The youngest juveniles are hyaline white with dark tentacles. The retractor muscles of the tentacles contrast internally as dark lines.

Of two specimens the genital tract was examined. The anatomy closely matched the detailed and illustrated descriptions by Giusti & Manganelli (1989) and Hausdorf (1990). Striking are two large protrusions on both sides of the vagina which each contain a large, slightly curved dart (Fig. 3; darts not visible).

TWO *XEROTRICHA* SPECIES IN THE NETHERLANDS

Xerotricha conspurcata may be confused with another *Xerotricha* species occurring in The Netherlands, i.e., *Xerotricha apicina* (Lamarck 1822), which lives next to the Kennemermeer in IJmuiden, province of North Holland (Fig. 2a-c) (Soes & De Winter, 2005). The description ‘a brownish shell with white spots and hairs’

fits both *X. conspurcata* and *X. apicina*, but the latter species has a cream-white shell with brown spots and shorter hairs. Anatomical examination of the genital tract should provide clarity about the determination (Giusti & Manganelli, 1989). Hairless shells of *X. conspurcata* may be confused with small shells of *Cer-nuella* and *Candidula* species. However, fully grown shells of those species usually show an internal thickening of the aperture, a sculpture of more regular riblets and a narrower umbilicus.

There is a fair chance that another *Xerotricha*-related species may reach northern Europe: *Microxeromagna lowei* (Potiez & Michaud, 1835). Its distribution area is comparable to that of both *Xerotricha* species and it inhabits similar biotopes. Empty and somewhat eroded shells of *M. lowei* may be difficult to differentiate from those of *X. conspurcata*. But distinguishing fresh or live specimens is easy as the anatomic differences are evident (Cardevall & Orozco, 2017).

HABITAT AND ECOLOGY

The first specimen of *X. conspurcata* was found on 11.ix.2016 in the fringe of a wood with rough herbage and young trees and shrubs, close to a constructed pool (co-ordinates 51°22'48.3"N, 3°23'41.2"E) (Fig. 4).

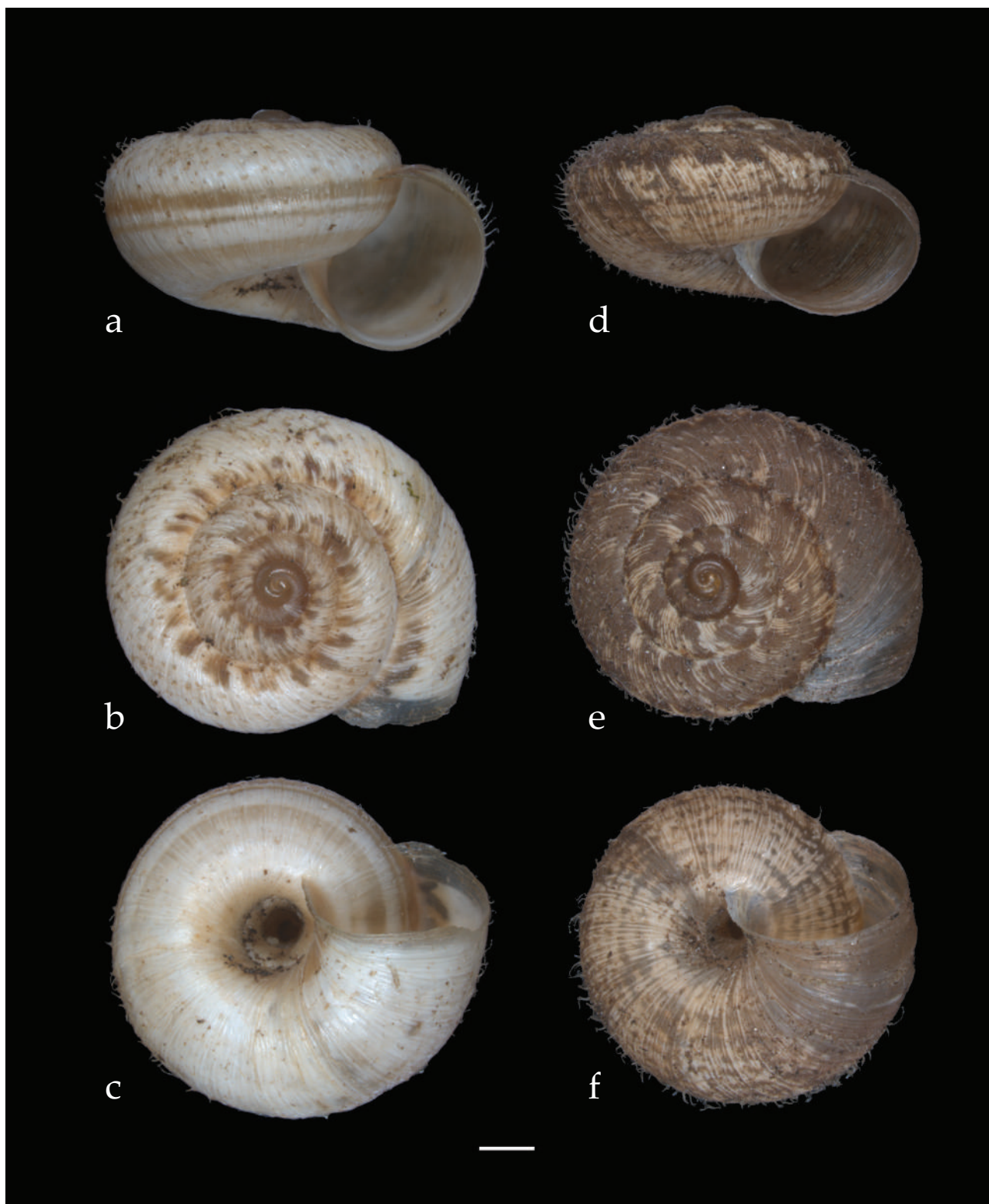


Fig. 2. Shells of *Xerotricha apicina* from IJmuiden (**a-c**, RMNH.MOL.339910) and *Xerotricha conspurcata* from Cadzand-Bad (**d-f**, RMNH.MOL.339911). **a,d**, apertural view; **b,e**, apical view; **c,f**, basal view. Bar represents 1 mm. Photographs by Jeroen Goud, NBC Naturalis.

In 2017, at this site, the species was only recovered as juveniles from a soil sample. But many more adults and juveniles were found about 200 m eastward, on and near a concrete wall (Fig. 5). Both locations are at

the foot of the land-facing side of the dunes.

The wood in which *X. conspurcata* was found in 2016 is dominated by Sycamore trees (*Acer pseudoplatanus*). Other tree species included Field maple (*Acer*

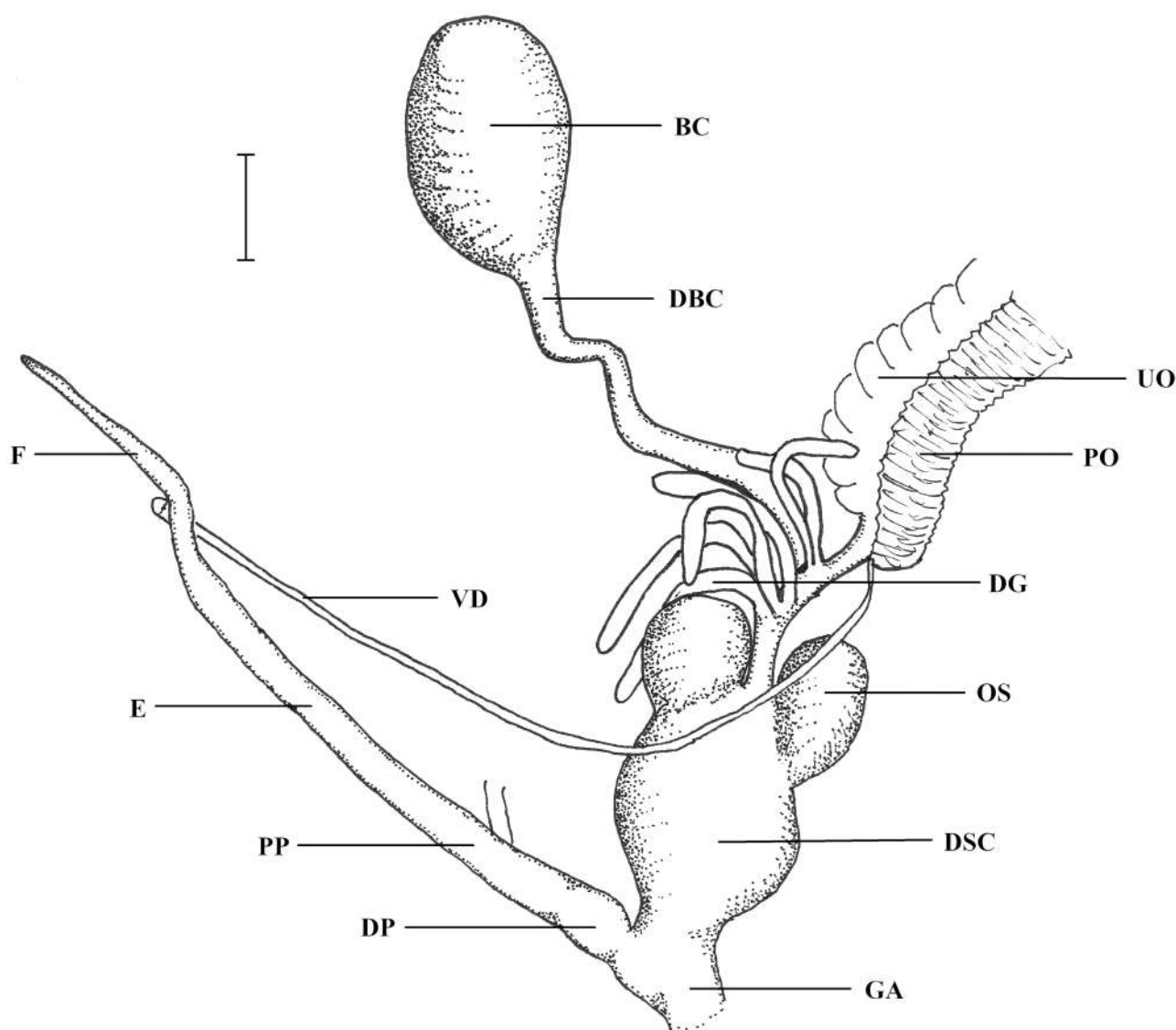


Fig. 3. Genital system of *Xerotricha conspurcata* from Cadzand-Bad, The Netherlands.

Abbreviations: BC: bursa copulatrix; DBC: duct of the bursa copulatrix; DG: digitiform glands; DP: distal penis; DSC: dart-sac complex; E: epiphallus; F: flagellum; GA: genital atrium; OS: outer stylophore; PO: prostatic portion of the ovispermiduct; PP: proximal penis; UO: uterine portion of the ovispermiduct; VD: vas deferens. Bar represents 1 mm. Drawing by Wim Maassen.

campestre), Black elder (*Alnus glutinosa*) and Common hawthorn (*Crataegus monogyna*). In the fringe of the wood grew, among others, blackberry (*Rubus spec.*), Common nettle (*Urtica dioica*) and Cow parsley (*Anthriscus sylvestris*). The vegetation bordering the pool is dominated by Reed (*Phragmites australis*) which reaches the border of the wood.

The 2017 site is a high, southerly exposed but lightly shaded concrete ground-retaining wall bordering a private parking lot (51°22'51.1"N, 3°23'52.1"E). During rainy weather, on a stretch of about 50 m of this wall some tens of specimens were found crawling around (Fig. 5). Higher up on the slope of the dune the species was also found on a parallel wall. At the base of both walls a small number of specimens was

(Opposite page)

Fig. 4. (top) Constructed pool close to Boulevard De Wielingen, Cadzand-Bad, The Netherlands, site where the first specimen was found on 11.ix.2016. Photograph by Stef Keulen.

Fig. 5. (bottom) Concrete wall marking a private parking lot near Boulevard De Wielingen, Cadzand-Bad, The Netherlands and harbouring a population of *Xerotricha conspurcata*. Photograph by Stef Keulen.





Fig. 6. Distribution map of *Xerotricha conspurcata* in Europe. Reproduced with permission after Welter-Schultes (2012: 575).

detected under stones, timber and cardboard. The density of the number of snails was low, i.e. less than one per m².

The vegetation on top of the lower wall is grassy, rich in herbs with trees and shrubs like willow (*Salix* spec.), Gray poplar (*Populus x canescens*), Sycamore, Wolfberry (*Lycium barbarum*), Privet (*Ligustrum vulgare*), Elder (*Sambucus nigra*) and Snowberry (*Symphoricarpos albus*). The undergrowth encompassed blackberry, Common nettle, Common ivy (*Hedera helix*), Bur (*Galium aparine*) and Large-flowered evening primrose (*Oenothera glazioviana*). The occurrence of Snowberry, for instance, suggests that not all of the vegetation emerged spontaneously.

According to Welter-Schultes (2012: 575) *X. conspurcata* lives “under stones and on the soil under dense vegetation, often in wall crevices, sometimes exposed to the sun”. This description closely matches the habitat in which the species was encountered. Possibly, the snails feed on algae and lichens on the walls and on decaying plants. In vitro the species prospered on humid cellulose paper, without any further addition (observation by the first author).

In Cadzand-Bad, the area in which *X. conspurcata* was found is rich in mollusc species. Next to *X. conspurcata* another 24 snail species were found (Table 1).

In the soil sample collected in 2017 at the site of the first find, only a few juvenile specimens of *X. conspurcata* were encountered, but no adult snail. In contrast, a far larger number of *X. conspurcata* specimens was found in a soil sample taken near the top of the wall: 222 individuals, constituting over half of the number of all snails found. Close to 95% of all *X. conspurcata* were very young; virtually all shells were fresh and even after processing of the soil sample still contained remnants of the animal.



Fig. 7. Distribution of *Xerotricha conspurcata* in The Netherlands.

DISTRIBUTION

Most likely *X. conspurcata* originates from the western Mediterranean area (Welter-Schultes, 2012) (Fig. 6). The new location in The Netherlands does not connect to the known distribution area (Fig. 7). Recently *X. conspurcata* was also encountered in Baden-Württemberg in Germany (Wiese, 2016: 269).

The number of specimens found in 2017 suggests that the population has existed for a longer period of time. The species was not found in between the two localities described above. This is remarkable because about 100 m west of the site of the larger population, a bunker of the WW II “Atlantikwall” does still exist. Parts of the concrete walls of this bunker are exposed and overgrown with algae and lichens.

DISCUSSION

Since 1980 the number of exotic molluscs in The Netherlands has greatly increased (Rijksoverheid, 2013). Many species of exotic land molluscs are unintentionally imported in and on cars, caravans, crates and the like (Aubrey et al., 2006). The fact that the private parking lot with the larger population of *X. conspurcata* belongs to an Italian restaurant suggests import of the species by vehicles or goods from Italy.

Most exotic land snails surviving in the Netherlands are not very critical with respect to their habitat. Stony, sun-exposed sites, small patches of wasteland with rough vegetation and fallow soil are acceptable.

Species	fringe wood and around pool	%	soil near top of lowest wall	%
<i>Aegopinella nitidula</i>	X		2	0.5
<i>Alinda biplicata</i>	1	1	70	16.1
<i>Candidula gigaxii</i>	3	3.1	2	0.5
<i>Carychium minimum</i>	10	10.4		
<i>Carychium tridentatum</i>	3	3.1		
<i>Ceciloides acicula</i>			1	0.2
<i>Cepaea nemoralis</i>	1	1		
<i>Cernuella virgata</i>	11	11.5	4	0.9
<i>Cochlicella acuta</i>			7	1.6
<i>Cochlicopa lubrica</i>	2	2.1	17	3.9
<i>Cochlicopa lubricella</i>	1	1		
<i>Cochlicopa spec.</i>	7	7.3		
<i>Cornu aspersum</i>			3	0.7
<i>Discus rotundatus</i>	3	3.1	X	
<i>Monacha cantiana</i>	2	2.1	43	9.9
<i>Oxychilus cellarius</i>	1	1	2	0.5
<i>Oxyloma spec.</i>	1	1		
<i>Trochulus hispidus</i>	4	4.2	37	8.5
<i>Vallonia costata</i>	21	21.9	10	2.3
<i>Vallonia excentrica</i>	2	2.1	1	0.2
<i>Vertigo pygmaea</i>	1	1		
<i>Vitrea crystallina</i>	1	1		
<i>Vitrina pellucida</i>	5	5.2	7	1.6
<i>Zonitoides nitidus</i>	4	4.2		
<i>Xerotricha conspurcata</i>	2	2.1	222	51.2
Slug shells	4	4.2	1	0.2
Unidentified, very juvenile	6	6.3	7	1.6
Total	96	100	434	100
Number of species observed	21		16	

Table 1. Mollusc species accompanying *Xerotricha conspurcata* near the constructed pool and at the base of the concrete walls. X: Species observed, not quantitated

Immigrants are often species of South-European origin that expand their living area northward (Cameron, 2016). In The Netherlands, they usually prefer the coastal area because here winters are milder than in the country's interior. The on average temperate climate of The Netherlands is even extremely temperate in the province of Zeeland. Winter temperatures are somewhat higher than inland (Rougoo et al., 2016).

Climate change, warmer summers and less cold winters (Rougoo et al., 2016) facilitate the establishment of Mediterranean species. The example of *X. conspurcata* is considered an illustration of this phenomenon.

As a Dutch vernacular name for *X. conspurcata*, the authors propose 'Gevlekte grasslak'.

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