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A new species of *Simnia* from England (Caenogastropoda: Ovulidae)

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Abstract

A new species of Ovulidae, *Simnia hiscocki*, is described from the Cornwall Peninsula, England, and compared with *Simnia patula* occurring in the same area, from which it differs in shell- and radula-morphological features as well as ecological features. DNA analysis suggests that it is a very young species whose host-specificity to *Eunicella verrucosa* makes it a potentially useful species for monitoring sea-temperature-change.

Key words: Ovulidae, *Simnia*, new sister species, Plymouth, radula differences, host-specific, climate change

Introduction

The family Ovulidae comprises more than 200 species distributed widely across tropical and sub-tropical seas (Lorenz and Fehse 2009). *Simnia patula* (Pennant, 1777) is an exception in this mainly tropical family, as it inhabits the cold waters of the northern Atlantic along the coasts of England and Norway. Only very recently, a sympatric sister-species was discovered on several sites along the Cornwall Peninsula and the Isles of Scilly, south-western England. It is described below.

Material and methods

Thirty four live-collected specimens of *Simnia hiscocki* n. sp. and more than 30 specimens of *Simnia patula* were available from several collecting sites around Plymouth, on the south of the Cornwall Peninsula, southwestern coast of England.

Further specimens of *Simnia patula* were examined from the northern coast of Brittany (MNHN, not registered), Guernsey, Orkney, from the Brittany in France (MNHN IM-2008-2728, IM-2008-2729) and Lista Fyr in the south of Norway (all CLSF). The samples from the locations near Plymouth and Scilly were collected by diving and preserved in alcohol immediately after collecting. That allowed a superficial study of the anatomy and determination of sex in most specimens. For the study of radulae, the animals were softened in distilled water for one hour, removed from the shell and then dissected. Radulae were compared from eight specimens each of *S. hiscocki* and *S. patula* from Hand Deeps. They were examined with standard light-microscopy, photographed and drawn.

Because of the fragility of the shells, only the length was measured manually using a precision caliper, other shell-parameters were taken from photographs of each shell. These photographs were taken with the aperture pointing up and the shell's axis parallel to the camera-lens. In addition to the length and the greatest width (measured in right-angle or parallel to the shell's axis respectively), the relation between the distance between the bulge of the columella and the outer side as opposed to the greatest dimension of the bulge (c) and the distance from the columellar bulge the to the outer lip (a) was examined (Fig. 1).

Genomic DNA was isolated from tissue samples (mantle or foot fragments) of five specimens of the species described here, and five specimens of *Simnia patula* by proteinase-K digestion and standard phenol-chloroform extraction. We amplified the barcode region of the COI gene using primers LCO1490 and HCO2198 (Folmer *et al*. 1994). PCR conditions were 94°C-50°C-72°C, 1 minute each for 40 cycles. Obtained PCR products were sequenced on a ABI 3730 DNA Analyzer and the sequences analyzed using BioEdit (Hall 1999) and MEGA 4 (Tamura *et al*. 2007); this resulted in fragment lengths of 658 bp.

Abbreviations
NHMUK: Natural History Museum, London
CLSF: Chiapponi-Lorenz Seashell Foundation, Lecco
MNHN: Museum National d'Histoire Naturelle, Paris

Systematics

Family **Ovulidae**

A recent review of this family is given by Lorenz and Fehse, 2009. Members of the family occur in tropical and temperate seas, even at greater depths. Most species are associated with soft corals, leather corals and black corals which serve as host. Some species feed also on sponges, brittle stars and crinoids. The shell is mostly smooth or with fine striae without exposed posterior end and columellar teeth. The labrum may have denticles and crenulations, as well as small spines occasionally. The mantle covers the shell and serves as camouflage by imitating parts of the host. The radular morphology is characteristic of the family. Development occurs through a veliger stage which can last for several weeks before reaching the crawling stage.

Genus *Simnia* Risso, 1826

Type species: *Simnia nicaeensis* Risso, A. 1826. By subsequent designation).

Members of this genus are distributed in the Atlantic and Mediterranean. All species of *Simnia* are characterized by a very thin, fusiform shell which lacks a callosed labral margin and the columellar side displays very few callosities.

Simnia hiscocki n. sp.

Synonymy:

Simnia cf. *patula*:- Lorenz and Fehse 2009, 97, pl. 123, Figs 9-10, A212, A214.

Material examined

Type material

Holotype: 16.4 mm, Hand Deeps, Plymouth area, England (50°12.53'N 4°20.58'W), at 21 m depth on *Eunicella verrucosa*, MNHN 23297; Paratype 1: 16.8 mm, Hand Deeps, Plymouth area, same data as holotype, CLSF 1-3609; Paratype 2: 13.3 mm, Hand Deeps, Plymouth area, same data as holotype, NHMUK 20110196; London; Paratype 3: 16.9 mm, Hand Deeps, Plymouth area, same data as holotype, CLSF 1-3610; Paratype 4: 12.3 mm, Hatt Rock, Plymouth area, (50°10.42'N 4°29.19'W), at 22 m depth, MNHN 24242; Paratype 5: 14.2 mm, Hand Deeps, Plymouth area, same data as holotype, in private collection of Dirk Fehse, Berlin; Paratype 6: 17.2 mm, Hilsea Point, Plymouth area, (50°17.32'N 4°02.70'W), MNHN 24245.

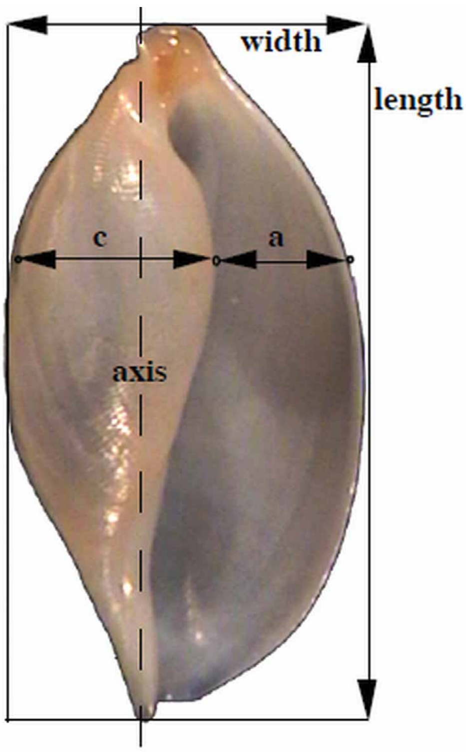

FIGURE 1. A shell of *Simnia* sp. showing the parameters used in measurements; c = columella, a = aperture.

Additional material examined

Twenty-one further specimens in the collection of the CLSF have been examined, measuring 9.4 to 18.7 mm in length (see Table 1).

No specimens of *S. hiscocki* were found in the reference collection of the MNHN and from our research, it has apparently never been mentioned or illustrated, either alive or as empty shell, except for the reference given in the synonymy.

Description

Shell (Figs 2 & 4) (description based on holotype): Fragile, semi-transparent, narrow cylindrical. Posterior tapering, forming constricted, slightly twisted canal that widens very slightly along outer edge. Slight development of callosity along peculiarly twisted funicular region, no funiculum visible. Columellar bulge faintly striate, not showing any callosity. Anterior tip pointed, formed by long, well-developed and slightly calloused fossular fold. Labral edge very thin and fragile, no indication of callosity. Last whorl glossy and smooth, showing fine, regular longitudinal growth-lines. Faint, distant incised striae visible on terminal collars and especially above the slightly callosed funicular region. Overall colour of shell rich orange-cream, calloused along posterior canal and fossular region slightly paler.

Comparison with paratypes indicates no discernible differences between smaller (young) shells and adults, except smaller shells tend to have more distinct striae towards extremities. Only length of posterior canal varies slightly, but shape and general colour constant. No differences in shell-size between males and females (8 males, and 11 females).

Shell dimensions – see Table 1.

TABLE 1.Shell dimensions (in mm) of *Simnia hiscocki* n. sp. c = columella, a = aperture w = width, l = length (c)w/l = width/length, a/c = aperture/columella.

	l	w	c	a	w/l	a/c
Holotype	16.4	6.3	13	8	38	62
Paratypes (SD)	14.3 (2.9)	5.2 (1.0)	10.7 (2.1)	7.0 (1.6)	36.7 (2.7)	65.6 (10.9)
Additional specimens (SD)	12.0 (4.3)	4.3 (1.3)	8.9 (2.7)	5.4 (1.9)	31.0 (8.3)	52.5 (16.3)

Head-foot (living material) (Figs 10A, B & C): Mantle thick, transparent with sparse wart-like papillae which vary in length. Some animals showing two or three small branches encircling pointed tip of papillae. In fully extended animal mantle forms regular corrugations along anterior part of labral edge. Siphon short, transparent and thick, foot fleshy and less transparent. Tentacles thick and short, usually not visible in photographs of active animal, mantle and foot decorated with conspicuous red transverse, parallel lines, often with intermittent rows of discrete red spots. In some specimens mantle covered only with rows of these spots; background coloration varies from brown to pale lemon.

Colour of proboscis greyish white. When withdrawn into shell, animal (visible through shell) appears bright red.

Radula (Fig. 9B): Typical of family, with flat rachidian tooth with pronounced central cusp and three to four denticles on either side. Lateral tooth with similar large central cusp and three to four smaller denticles. Inner marginal tooth flat, considerably enlarged, with 40–50 fine filaments, some bifurcate at tip. Outer marginal tooth wider than inner, with comb of 60-75 filaments, many bifurcate at tip.

Spawn: Of 15–20 circular egg-capsules 2.2–2.5 mm in diameter embedded in mucus to which mud and other particles may adhere. Capsules deposited around branches of host. Each capsule contains several hundred larvae. When deposited, spawn pale yellow, and later turns brown due to development of larval shells.

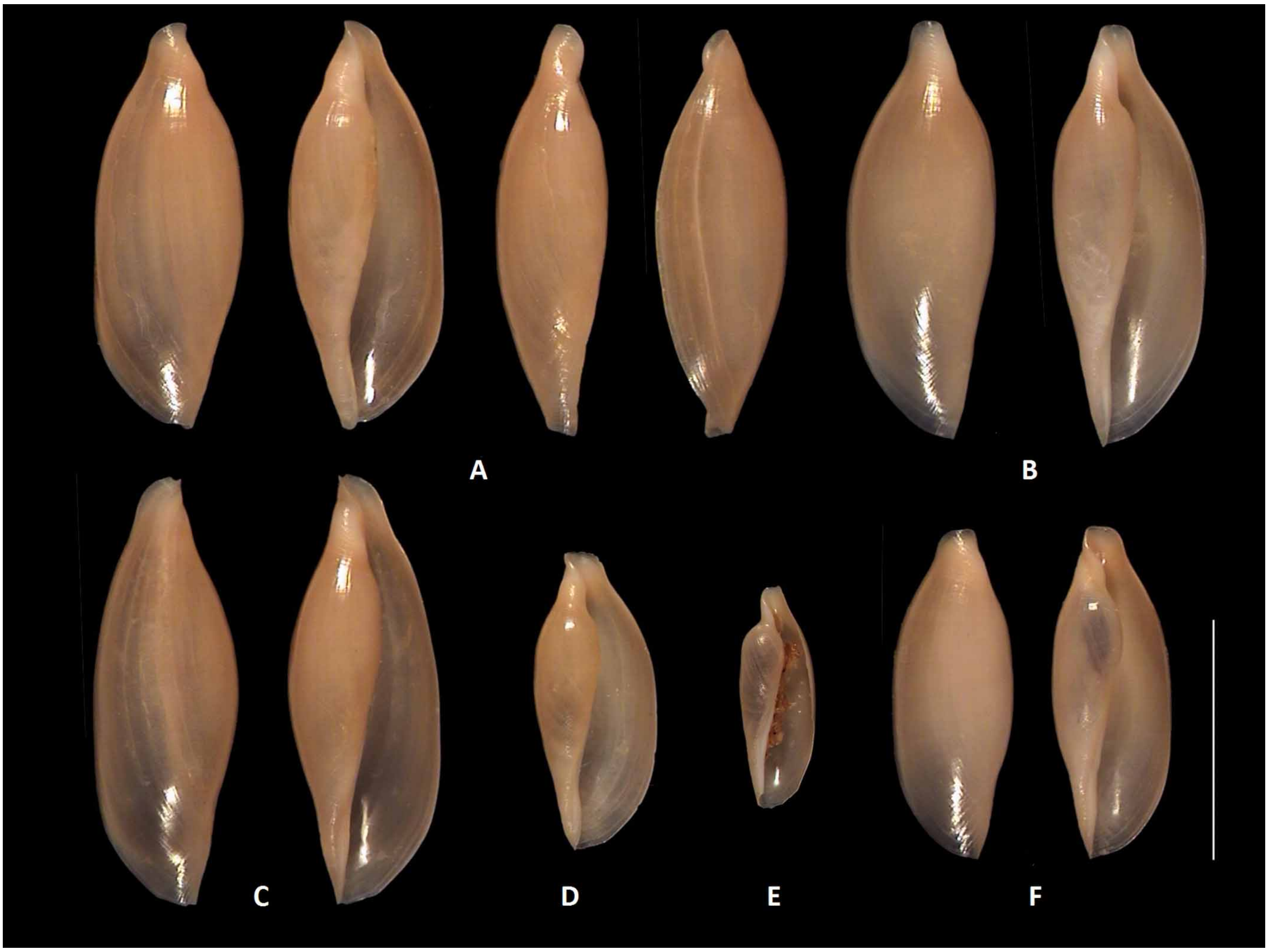

FIGURE 2 *Simnia hiscocki*. **A**, dorsal, basal and lateral aspects of holotype (MNHN 23297); **B**, dorsal and basal aspect of paratype 1 (CLSF 1-3609); **C**, dorsal and basal aspects of paratype 6 (MNHN 24245); **D**, basal aspect of paratype 4 (MNHN 24242); **E**, basal aspect of juvenile specimen (CLSF 1-3622); **F**, dorsal and basal aspects of paratype 2 (NHMUK 20110196). Scale = 10 mm.

Remarks

A summary of the differences between species of *Simnia* are given in Table 2. Of particular note, *Simnia hiscocki* n. sp. is distinctly more slender and has a richer orange-cream coloration compared to the more roundly inflated, paler *S. patula* from the same locality. The shell also differs in a consistent difference in the relationship between the width and the length (see Figs 5, 6) and the relative positon of the width of the aperture at the widest point of the columella. The animal of *S. hiscocki* shows straight transverse lines which do not form irregular branches as in *S. patula* (see Figs 10, 11) and the radulae show differences in the structure of the lateral teeth (see Fig. 9). The new species differs from its southern congeners *S. nicaeensis* and *S. aperta* (both with a distribution from the Mediterranean to the northern coast of Spain) in the richer shell-colour compared to the equally slender *S. nicaeensis*, and the narrower, more pointed shell compared to the equally orange *S. aperta*. The animals of *S. nicaeensis* and *S. aperta* show considerable differences in the formation of papillae and mantle-colouration (see Figs 7, 8, 10). *S. hyalina* from the submerged volcanic seamounts in the central Atlantic differs from all congeners by a more distinct shell-sculpture consisting of incised striae, and a transparent, completely colourless shell with short terminals.

Habitat and distribution

Simnia hiscocki has so far been found exclusively on the Pink Seafan *Eunicella verrucosa* (Pallas, 1766) at depths between 20 and 35 m. It is known mainly from the vicinity of Plymouth (type locality: Hand Deeps, Lundy Island in the north of the Cornwall Peninsula (B. Picton, pers. comm.), and the Isles of Scilly in the southwest of England. Reports of similar shells from other areas need confirmation.

On photographs, the fully extended animal of *Simnia hiscocki* is slightly paler and not well adapted in colour and pattern to the appearance of its host, the Pink Seafan *Eunicella verrucosa*

Etymology

Named for its discoverer, Dr. Keith Hiscock, marine biologist and underwater photographer of Plymouth, England. He collected most of the material available for this study, took photographs of living animals, and contributed with field observations.

Discussion

The species of the genus *Simnia* show shell-features that suggest either neoteny or progenesis as there is no callosed labral margin and on the columellar side the callosities found in other members of the family (*e.g*., a funiculum or denticles) are hardly apparent. This phenomenon may be an adaptation to the temperate waters of northern Europe which are inhabited by *Simnia patula* but by no other member of the family Ovulidae. The advantage may be that growth is no longer determined as it is in those species forming a labrum that narrows the aperture and subsequently inhibits further growth. Larger specimens of *Simnia patula* show growth lines and bulging whorls that suggest a continuation of growth after reaching sexual maturity. Only *Neosimnia hammesi* (Bertsch and Bibbey, 1982) from Pacific Panama has a similar paper-thin shell. The taxonomy of the genus *Simnia* and its species was revised by Lorenz and Fehse (2009). In their discussion of *S. patula*, they point out that "an elongate population occurs of *Eunicella* sp. off the coast of Plymouth, England. It may represent a separate species...", which refers to the new species described herein.

The genus *Simnia* contains five named species separable mainly by their living animals, the general shell shape, shell-sculpture, host-preference and distribution. Table 2 summarises the differences between these taxa.

The most similar species are:

Simnia nicaeensis Risso, 1826: Shell plain white, very slender, glossy, smooth. On *Eunicella verrucosa*. From the northwestern Mediterranean, from 50 to 200 m, and recently discovered in Galicia, northwestern Spain, at 30 m (Fehse *et al*. 2010).

Simnia aperta (Sowerby II, 1849): Shell orange to brown, slender to inflated cylindrical, less glossy, smooth. Found on *Alcyonium glomeratum*. Mostly found in the Mediterranean, mainly from Italy and Croatia, at 50 to 200 m, but also reported from Galicia, northwestern Spain, at 20 m (Fehse *et al*. 2010). The exact distribution in the Atlantic is unknown.

Simnia hyalina Lorenz & Fehse, 2009: Shell transparent, colourless, rather short, with distinct incised striae. It inhabits deep waters of 200 to 500 m, on the isolated Atlantic seamounts of Hyères Bank, Josephine Bank and Irving Bank that are located approx. 1000 km south of the Azores, where the species was dredged with samples of an indeterminate species of *Eunicella* Verrill, 1869.

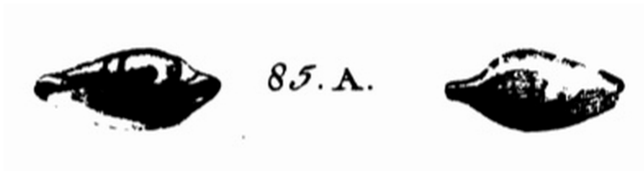

FIGURE 3 The original figure of *Simnia patula* reproduced from Pennant, 1777, fig. 85A.

Simnia patula was described and illustrated by Pennant (1777: 101, plate 85A) as follows: "Bulla patula: one end much produced, and fusiform. The aperture very patulous." The illustration (Fig. 2) leaves no doubt about the identity of Pennant's concept of the species and the populations assigned to his taxon today. Later names all undoubtedly refer to the same species, or have no illustrations or indications of type depository, and in the context of this study must be considered *nomina dubia.* Two of these names that may refer to *Simnia* (*Ovula virginea* Cantraine, 1835 and *Ovula papyracea* Fischer von Waldheim, 1807) must be considered *nomina nudi*, as both descriptions lack an image of the shell and do not give distinctive characters. Also, no type locality is given. An effort to locate type specimens in European museum collections failed (D. Fehse, pers. comm. 2010).

Simnia patula is found from just below the intertidal zone to approximately 75 m (Lorenz and Fehse, 2009). The distribution stretches from Orkney to the western coast of Norway, across all of England and Ireland, the Channel Islands, the coasts of northern France and Holland (Cate, 1973; Lorenz and Fehse 2009; Fehse, pers. comm. 2010). It has not been reported from the coasts of Belgium and Germany. Reports from the Atlantic coast of Spain and Portugal and the Canary and Cape Verde Islands require confirmation, as the conchologically similar *Simnia aperta* has been discovered in Galicia and may be more widespread in the Atlantic than previously known. *Simnia patula* is found in association with several coelenterate hosts: *Alcyonium digitatum* Linnaeus, 1758 and other species of *Alcyonium*, *Eunicella verrucosa* (Pallas, 1766) and *Tubularia indivisa* Linnaeus, 1758. The shell of typical *Simnia patula* is rather constant along the coasts of England, France and other areas from the southern end of the distribution. The general shape of the shell is roundly inflated, the last whorl is disproportionally wider than earlier whorls. The posterior terminal is distinctly projecting, rounded and slightly twisted upward. The aperture is very wide, with a rounded labral edge. The general colour varies from plain white to pale yellow-cream. In the adult shell, there is a slight development of a callus as along the entire columella, there may be a darker layer of irregular callous matter (Fig. 4 C) and the inner wall of the labrum may show a callous ridge (Fig. 4 B). Shells from northern (colder) localities such as Norway may reach a length of 25 mm whereas specimens from the south of England and the Atlantic coast of France rarely exceed 18 mm. Shells exceeding this size are nearly always distorted as a result of additional growth-lines added to the shell—a possible result of progenesis (see above).

FIGURE 4 *Simnia* species. **A**, *Simnia patula*, Hilsea Point, Plymouth (16 mm length) (CLSF 1-788); **B**, *Simnia patula*, Hatt Rock, Plymouth area (19 mm length) (CLSF 1-801); **C**, *Simnia patula*, Hands Deep, Plymouth area (13 mm length) (CLSF 1-1097); **D**, *Simnia nicaeensis*, Alghero, Italy (20 mm length) (CLSF 1-2399); **E**, *Simnia aperta*, Capraia Is., Italy, 70 m (16 mm length) (CLSF unregistered) (CLSF 1-2408); **F,** *Simnia hyalina*, Hyères Seamount, Atlantic Ocean, 480 m (11 mm length) (MNHN unregistered). Scale = 10 mm.

The new species caught Dr. Hiscock's attention because it lives in the same depth and area as *S. patula*, but is found exclusively on *Eunicella verrucosa* whereas *S. patula* in the same area is only rarely found on that host but usually on *Alcyonium digitatum*. The two species differ considerably from each other: *Eunicella verrucosa* is a delicately branched seafan whereas the *Alcyonium digitatum* (Dead Man's Hand) is a solid soft coral. This host preference was the initial factor that led to further investigations. The differences between *Simnia hiscocki* and *S. patula* are quite obvious when shells from the same locality (Plymouth) are compared. The graphs in Figs 5–6 illustrate these differences, and also include the other three taxa of *Simnia* (see also Remarks). Specimens of the two taxa from the same host retain the differences in shell-colour and shape, which are therefore not linked to the diet, which includes parts of tissue of the host, as well as secretions of the gorgonacean polyps.

Simnia aperta and *S. nicaeensis* were recently discovered also in Galicia, the northwestern Atlantic tip of Spain (Figs 7, 8) (Fehse *et al*. 2010). The observations made on their habitat and their animal characteristics display an interesting parallel to their English congeners. As in *S. patula* and *S. hiscocki*, two sympatric species occur at similar depth (20–30 m), on different hosts: the slender *S. nicaeensis* on *Eunicella verrucosa*, the broader *S. aperta* on *Alcyonium* *glomeratum*. As in the case of *S. hiscocki* and *S. patula*, the slender *S. nicaeensis* inhabits the delicate *Eunicella*, the broader *S. aperta* is found on the more solid *Alcyonium*. However, the concept of colouration is opposite: the broader *S. aperta* has a saturate orange shell like its Mediterranean relatives, whereas the slender *S. nicaeens*is is plain white. The comparison of shell-measurements shows that the shell-shape of *Simnia hiscocki* is closest to *S. nicaeensis* in having a comparable width / length index. This is most probably a result of adaptation to the narrow branches of their common host *Eunicella*. The only consistent conchological difference between them is the orange shell of *S. hiscocki* against the plain white shell of *S. nicaeensis*.

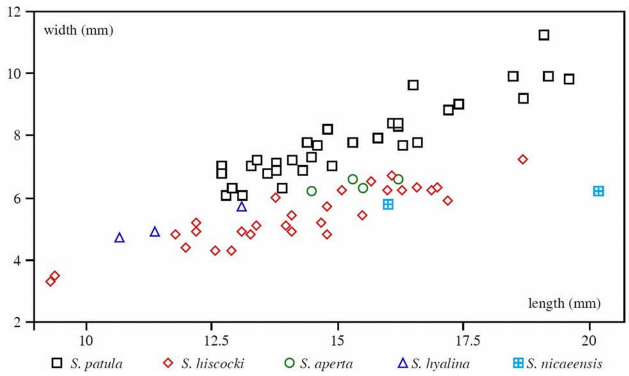

FIGURE 5. Relationship between shell width (w) and length (l) in the species of *Simnia*.

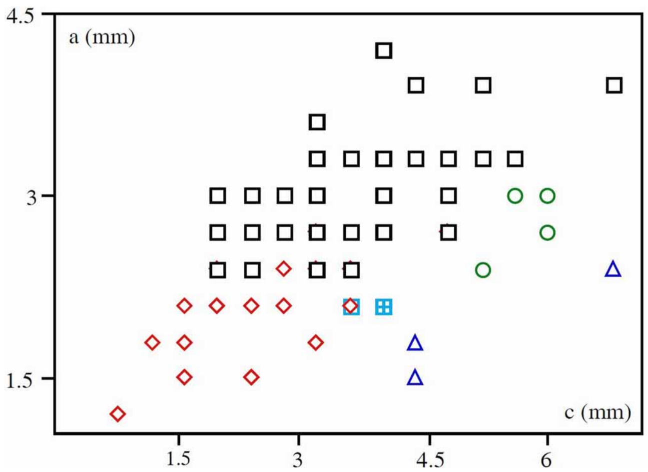

FIGURE 6. Relationship between the dimensions of the width of the aperture (a) and between the columellar bulge and the left side (c) in the species of *Simnia*. Exceptionally large and distorted or otherwise malformed specimens of *S. patula* were excluded.

The shells of *S. patula* and *S. aperta* are similar in being shorter and broader, and they differ mainly by the more saturate orange to brown colouration of *S. aperta* opposed to the grey to yellowish shell of *S. patula*.

The animals of the English taxa differ considerably from each other and from their southern relatives. Both, *S. aperta* and *S. hiscocki* have transparent mantles with rather small papillae. The mantles are ornamented with numerous orange spots and transverse lines. In *S. patula*, these lines are irregular and branching, with occasional intermitted spots. The lines on the mantle of *S. hiscocki* are very variable in their density and width, but they are always straight, not irregular and not branching, and occasionally replaced by rows of spots.

FIGURE 7. *Simnia nicaeensis*, living animal from Galicia, NW Spain. Length of the animal approx. 16 mm. Photo by Dr. Jacinto Perez Dieste.

FIGURE 8. *Simnia aperta*, living animal from Galicia, NW Spain. Length of the animal approx. 16 mm. Photo by Dr. Jacinto Perez Dieste.

Simnia aperta and *S. nicaeensis* do not have darker lines on their mantles. The animal of *S. aperta* is saturate orange-brown and lacks darker pattern or lines. The papillae are small and very densely set. The animal of *S. nicaeensis* is plain white with sparse yellow spots (not arranged in transverse rows). The papillae are very prominent and far more densely set than in the English congeners (Fehse *et al*. 2010)

The radulae of sympatric *S. patula* and *S. hiscocki* show a general resemblance, except for the filaments of the lateral teeth, which are considerably more numerous in *S. hiscocki*: with 60–75 on the outer lateral and 40–50 on the inner lateral, compared with 30–35 and 25–30 respectively in *S. patula*. In addition, the tips of the filaments are usually trifurcate in *S. patula* rather than bifurcate as in *S. hiscocki* (Fig. 9).

The animals of *S. patula* and *S. hiscocki* are very similar and variable. The mantle of *S. hiscocki* usually shows more numerous, dotted transverse lines and more prominent papillae than *S. patula*.

TABLE 2. Comparison of the some key features separating the species of *Simnia*.

	S. hiscocki	*S. patula*	*S. aperta*	*S. nicaeensis*	*S. hyalina*
Distribution	Cornwall, England	Atlantic Europe to Cape Verde	E Mediterranean to NW Spain	W Mediterranean to NW Spain	Central Atlantic seamounts
Depth	10–20 m	intertidal-300 m	20–100 m	30–100 m	>400 m
Host	*Eunicella verrucosa*	*Alcyonium* sp., *Eunicella* sp.	*Alcyonium* sp.	*Eunicella* sp.	*Eunicella* sp.
Mantle	transparent, regular darker transverse lines and rows of darker spots	transparent, irregular, branching darker lines with few intermitted spots	uniform orange-brown, no lines or spots	uniform white, sparse small yellow dots	transparent, no lines or spots
Papillae	sparse, branching	sparse, wart-like	dense and numerous, variably sized	numerous, variably sized, some very large	absent
Shape of shell	very slender	oval, mostly broad	slender to inflated, cylindrical	very slender	rather slender
Shape of posterior extremity	rostrate, narrow, rather straight	short, tapering ronded, wide, slightly bent	rather short, rounded, wide, slightly curled	rostrate	stunted rounded
Striation at extremity	incised, distant	fine, narrow	fine, narrow	obsolete	coarse, narrow
Striation on dorsum	absent	absent	faint	absent	distinct
Shell colour	orange-brown	grey	red to brown	white	translucent white
Outer margin of posterior extremity	developed, funnel-shaped	developed, bent up	slightly developed, straight	hardly developed	hardly developed-absent
Fossula	absent	weak to well developed, short	mostly well developed, rather short	well developed, long	slightly developed, short

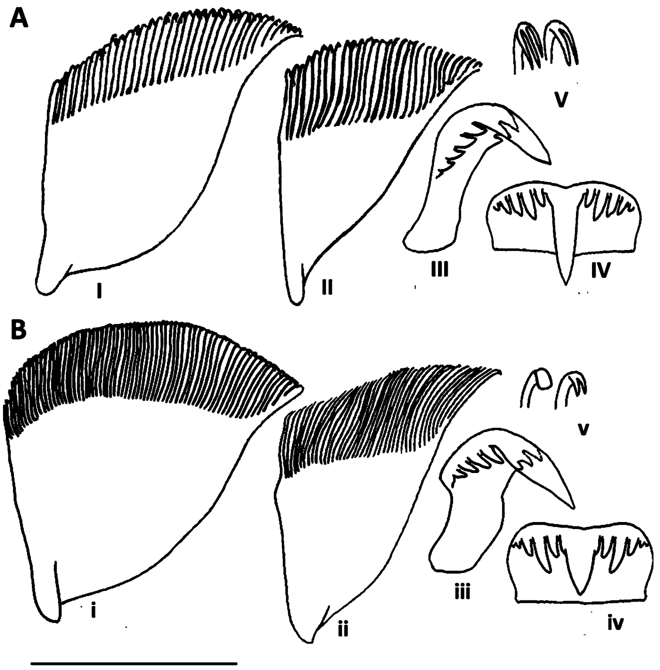

FIGURE 9. Left half of a row of radular teeth. A, S. patula; B, S. hiscocki. I, outer lateral; II, inner lateral; III, marginal; IV, rachidian; V, detail of the tips of the lateral teeth filaments (not to scale). Scale (I–IV): 0.1 mm.

The sequences of the mtDNA show only minor differences between *S. patula* and *S. hiscocki*. These results are consistent with studies on sister-species of Littorinidae from the north-eastern Atlantic (Kemppainen *et al*. 2009) and species of Conidae from the Cape Verde Islands (Duda and Rolán 2005). These findings are interpreted as an indication that *Simnia patula* and *S. hiscocki* have undergone speciation recently, possibly following the sea level-fluctuations of the Wurm III glacial period. A comprehensive discussion of the genetic analysis and its phylogenetic implications conducted on these two taxa and the related *Simnia hyalina* is in preparation.

Further research is necessary to learn more about the range of *S. hiscocki* and why it is restricted to *Eunicella verrucosa*. The more slender shape of the shell probably adapts better to the narrow, current swept branches of that seafan, whereas the broad and flat shell of *S. patula* appears to attach better to the solid *Alcyonium*. A morphological dimorphism of *S. patula* in other areas of the Atlantic has not been reported, regardless of the host that came with the animals. The different host preference along with consistent shell and radular differences supports the recognition of two taxa, which display the same evolutionary pattern as their congeners *S. aperta* and *S. nicaeensis* in Galicia.

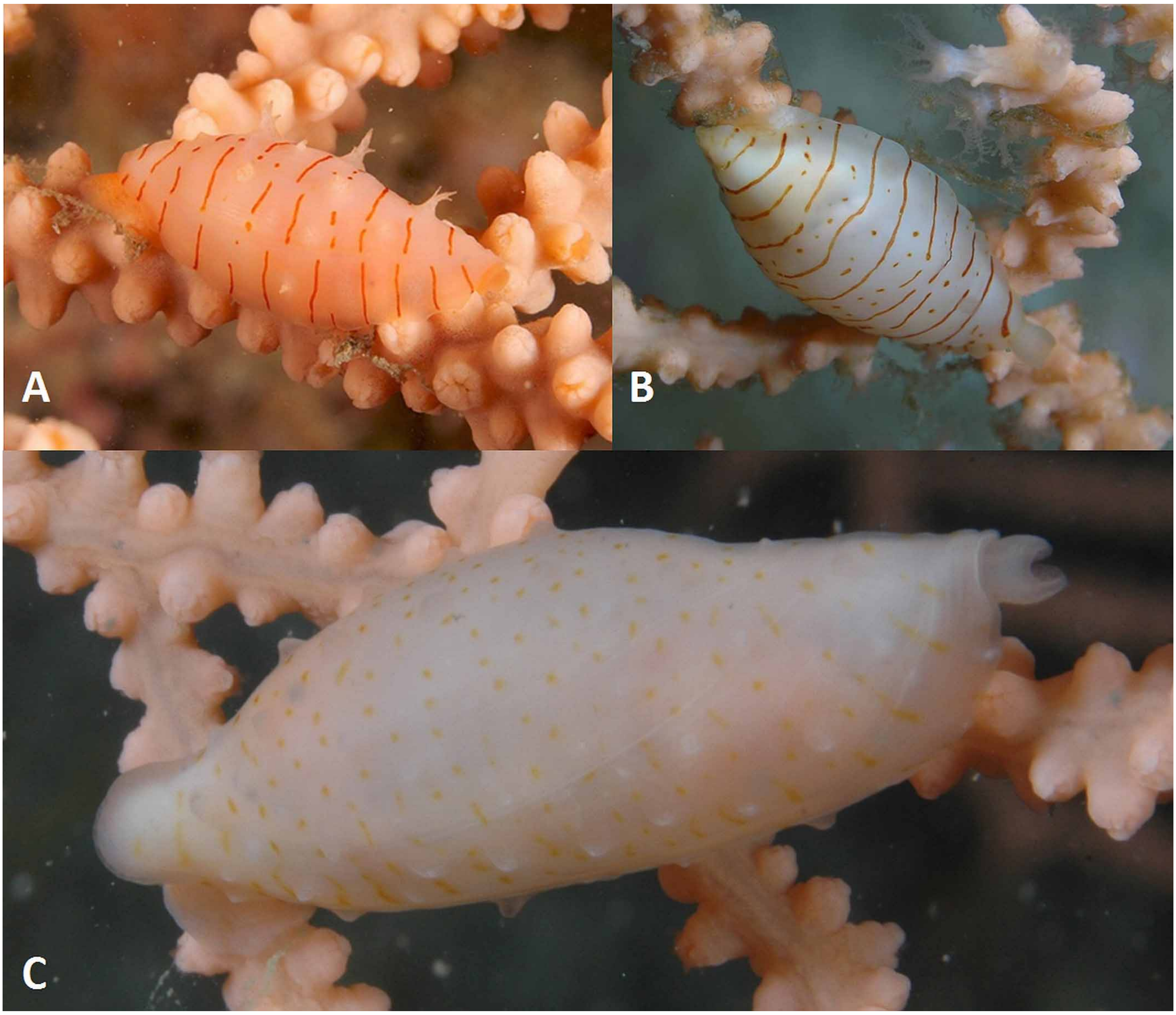

FIGURE 10. *Simnia hiscocki*, living animals. A, photo by Jason Gregory; B, C, photos by Keith Hiscock, all from Plymouth area, England. Length of the animals approx. 14–17 mm.

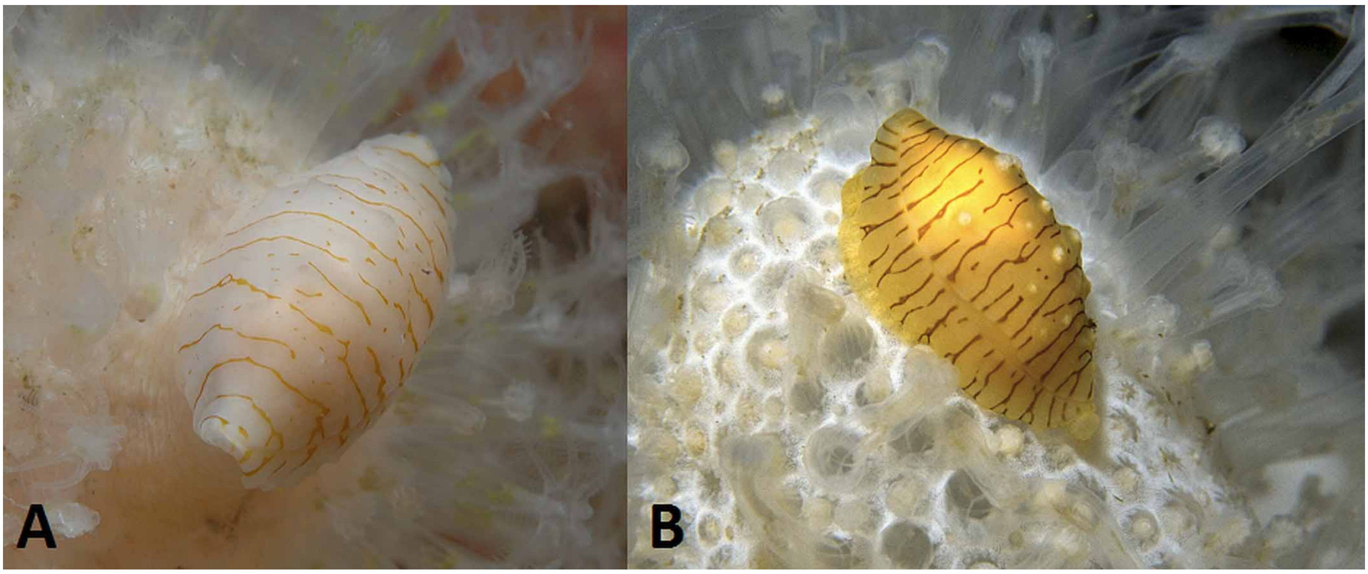

FIGURE 11. *Simnia patula*, living animal. **A**, photo by Keith Hiscock; **B**, photo by Jim Anderson. All pictures taken in the Plymouth area, England. Length of the animals approx. 15–17 mm.

Eunicella verrucosa has recently come in focus as a key species for monitoring changes in sea-temperature. Diseased populations of *Eunicella verrucosa* were reported from south-western England (Hall-Spencer *et al*. 2007). Elevated temperature was identified as stress-inducing factor supporting infestation with several types of bacteria causing necrosis in *Eunicella* colonies (Martin *et al*. 2002). The larval dispersal of these seafans is influenced by water temperature and pollution, and adult colonies are subject to a higher infestation with 'parasites' when the environmental conditions are not ideal (Munro and Munro 2003). Among these, the sea-slug *Tritonia nilsodhneri* Marcus, 1983 and *Simnia patula* are repeatedly mentioned. It is possible that some reports of "*S. patula*" may refer to the new species.

The occurrence and abundance of certain host-specific Ovulidae such as *Simnia hiscocki* may prove useful as indicators for monitoring the host cnidarian populations and contribute to monitoring programs relating to pollution, climate change or other factors that influence their growth and dispersal. The discovery of a new species of Ovulidae at Europe's 'front-door' reveals how much basic research still needs to be done in our quest to understand marine biodiversity.

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References

Cate, C.N. (1973) A systematic revision of the recent Cypraeid family Ovulidae. *Veliger* 15 (supplement): 1–117.

Duda, T.F. & Rolán, E. (2005) Explosive radiation of Cape Verde *Conus*, a marine species flock. *Molecular Ecology* 14, 267–272.

Fehse, D., Trigo, J.E., Pérez Dieste, J. & Aldrey, J.M. (2010) Three new records of the family Ovulidae for Galicia (NW Spain) and discussions on their valid nomenclature. *Gloria Maris* 49, 141–153.

Folmer, O., Black, M., Hoeh, W., Lutz, R. & Vrijenhoek, R. (1994) DNA primers for amplification of mitochondrial cytochrome c oxidase subunit I from diverse metazoan invertebrates. *Molecular Marine Biology and Biotechnology* 3, 294–297.

Hall, T.A. (1999) BioEdit: a user–friendly biological sequence alignment editor and analysis program for Windows 95/98/NT. *Nucleic Acids Symposium Series* 41, 95–98.

Hall-Spencer, J.M., Pike, J., & Munn, C.B. (2007) Diseases affect cold-water corals too: *Eunicella verrucosa* (Cnidaria: Gorgonacea) necrosis in SW England. *Diseases of Aquatic Organisms* 76, 87–97.

Kemppainen, P., Panova, J., Hollander, J. & Johannesson, K. (2009) Complete lack of mitochondrial divergence between two species of NE Atlantic marine intertidal gastropods. *Journal of Evolutionary Biology* 22, 2000–2011

Lorenz, F. & Fehse, D. (2009) *The living Ovulidae - A manual of the families of allied cowries Ovulidae, Pediculariidae and Eocypraeidae*. ConchBooks, Hackenheim.

Martin, Y., Bonnefort, J.L. & Chancerelle, L. (2002) Gorgonians mass mortality during the 1999 late summer in French Mediterranean coastal waters: the bacterial hypothesis. *Water Research* 26, 779–782.

Munro, C. & Munro, L. (2003) Climate change impacts of seafan populations. *Reef Research* 8, 1–33

Pennant, T. (1777) *British zoology Vol. IV Crustacea, Mollusca, Testacea*, White, London.

Tamura K., Dudley J., Nei M. & Kumar S. (2007) MEGA4: Molecular Evolutionary Genetics Analysis (MEGA) software version 4.0**.** *Molecular Biology and Evolution* 24, 1596–1599.