

Four new fossil *Napaeus* species (Gastropoda: Enidae) from La Gomera (Canary Islands)

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Four fossil species of *Napaeus* from various parts of the Canary Island of La Gomera are new to science. The species are described and compared with other species of this genus. Including these four species, there are now 31 *Napaeus* species known from La Gomera and 76 species from the whole Canary archipelago. La Gomera is as such by far the most diverse island with respect to *Napaeus*.

Key words: Enidae, *Napaeus*, fossil, La Gomera, Canary Islands, Macaronesia

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INTRODUCTION

The genus *Napaeus* Albers, 1850 is endemic for Macaronesia and only found on the Azores and the Canary Islands (Backhuys, 1975; Groh, 1985; Groh et al., 1992; Henriquez et al., 1993a; 1993b; Alonso et al., 1995; Bank et al., 2002; Alonso et al., 2006; Castillo et al., 2006; Talaván Serna & Talaván Gómez, 2008; Yanes et al., 2009; 2011a; 2011b; Holyoak et al., 2011; Nordsieck, 2014; Alonso & Ibáñez, 2015; Helixebas, 2023).

Yanes et al. (2009) discussed the differences between *Napaeus* from the Azores and the Canary Islands and listed 56 species from the Canary Islands. In the following years, another 14 species were described for this archipelago. Alonso & Ibáñez (2015) give an overview from 70 species of *Napaeus* from the Canary Islands, providing information on type material, the Red List category of the IUCN, and photos of all species. One of these species, *Napaeus lajaensis* Castillo, Yanes, Alonso & Ibáñez, 2006, is only known as a fossil species from a Pleistocene aeolian deposit on Tenerife (Castillo et al., 2006; Alonso & Ibáñez, 2015).

The species *Napaeus arinagaensis* Artiles, Deniz & Martin, 2011 (in Yanes, et al., 2011a), originally described as a fossil species, was subsequently found alive in 2013 (Alonso & Ibáñez, 2015). Miller et al. (2022) described two new fossil species from Tenerife, making a total number of 72 species for the Canary Islands. More fossil *Napaeus* specimens are recorded, but those records concern taxa that are still living on the Canary Islands (Groh, 1985; Talaván Serna & Talaván Gómez, 2008; Alonso & Ibáñez, 2015).

One of the Canary Islands, La Gomera, is very rich in *Napaeus* species (Yanes et al., 2009; Santana et al., 2013; Alonso & Ibáñez, 2015). In total, 27 species are recorded, all being endemic for the island, except for *N. ocellatus* (Mousson, 1872), about which are doubts on the origin of the syntype from El Hierro. Wollaston (1878) got one specimen of *N. ocellatus* from Hermigua, La Gomera, collected by Baron Paiva. Beck & Rähle (2006) recorded a fossil specimen from Hermigua. Another species, *N. inflatiusculus* (Wollaston, 1878), has never been found since its description (Yanes et al., 2009; Santana et al., 2013; Alonso & Ibáñez, 2015). From the other 25 *Napaeus*, a few species are recorded as fossil as well (Groh, 1985; Beck & Rähle, 2006; Talaván Serna & Talaván Gómez, 2008; Jesus Santana Benitez in mail)

Working on a monograph about the non-marine molluscs of La Gomera, except for *N. inflatiusculus* but including *N. ocellatus*, 26 extant *Napaeus* species from La Gomera were recorded alive. From some extant species, fossil specimens were found as well. However, four fossil *Napaeus* species show characteristics distant from the extant species. These new fossils are described below. Measurements were taken using a calliper to the nearest 0.1 mm.

SYSTEMATIC PART

Superfamilia Pupilloidea W. Turton, 1831

Familia Enidae B. B. Woodward, 1903 (1880)

Subfamilia Eninae B. B. Woodward, 1903 (1880)

Genus *Napaeus* Albers, 1850

Napaeus Albers, 1850: 179. Type species (by subsequent

designation of Herrmannsen, 1852: 90): *Bulimus baeticatus* Webb & Berthelot, 1833.

***Napaeus vanooijeni* spec. nov.**

Figs 1-7

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Type locality. — Barranco de la Era Nueva (Vallehermoso), La Gomera, Canary Islands; all shells are found within about one square meter in sand on the foot of a fossil deposit next to the path from Vallehermoso to Ermita Santa Clara (28.184260, -17.279090, alt 382 m a.s.l., Fig. 1).

Type material. — Holotype (RGM.1364047) found on 7.x.2022, legit Kees Margry (Figs 2a-e, 7). Paratypes: 20.xi.2021, Barranco de la Era Nueva: 4 specimens including two incompletes (RGM.1364049; Figs 3-4); 7.x.2022, Barranco de La Era Nueva: 4 specimens including two incompletes (RGM.1364048; Figs 5-6). The holotype and paratypes are stored in the collection of Naturalis Biodiversity Center,



Fig. 1. Type locality from *Napaeus vanooijeni* spec. nov. in Barranco de la Era Nueva, Vallehermoso. Photo: Ingrid Margry-Moonen.



Figs 2-6. *Napaeus vanooijeni* spec. nov. from La Gomera, Barranco de la Era Nueva. **2a-e:** holotype RGM.1364047; **a:** frontal view with on the right side enlarged part of the riblets in 4 × 4 mm; **b:** side view; **c:** backside; **d:** dorsal side; **e:** ventral side. **3-4:** paratypes RGM.1364049. **5-6:** paratypes RGM.1364048. Scale bar is 20 mm; see also Table 1. Photos: Ingrid Margry-Moonen.

Leiden, The Netherlands.

Description of the holotype (Figs 2a-e, 7, Table 1). — This shell belongs to one of the larger *Napaeus* species with its height of 23.4 mm and a width of 11.5 mm. The width of the body whorl above the aperture is 10.4 mm. From the apex, the conical shell becomes regular and noticeably wider and has $7\frac{3}{4}$ flattened to slightly convex whorls. The body whorl is about 63% of the total height. There is a clear but shallow suture. The aperture is oval and relatively simple, is 9.8 mm high and 7.2 mm wide and is slightly inclined to the axis of the shell. The peristome is a little reflected. The parieto-palatal angle of the peristome is rounded to rounded angular. The umbilicus is closed. The protoconch is smooth, the teleoconch has oblique rather regular but small riblets which are variable in width. From the palatal side these riblets bend upward at an angle of approximately 45 degrees to the suture in the transition to the penultimate whorl. In this part are about 30 riblets in 4 mm length. On and between these riblets very small depressions are visible. On one little part closer to the umbilicus area, crossing riblets cause an irregular undulating pattern. The colour of the shell is light brown with a deposit of very small dark brown to black spots. Some parts have an undamaged shiny surface. The shell is very fragile.

Description of the paratypes. — All complete specimens resemble the holotype in size and shape, and in the regular but small riblets on the whorls (Figs 3-6). Due to wear, nothing can be seen of crossing riblets close to the umbilicus.

Derivatio nominis. — The epithet *vanooijeni* is derived from Jos (J.J.M.M.) van Ooijen, a former colleague biologist and friend, with a great interest in malacology and who has committed himself throughout his career to education aimed at a sustainable world.

Discussion. — *Napaeus vanooijeni* spec. nov. is one of the

largest species of the genus *Napaeus* and is distinguished by the typical riblets and the shape and relative size, the form, and the position of the aperture (Fig. 4). Only *N. ripkeni* spec. nov. has a conical top (Figs 8, 17-19) similar to that of *N. vanooijeni* spec. nov. In *N. vanooijeni* spec. nov. the palatal peristome is at its insertion more strongly curved than in *N. ripkeni*, and the peristome is over its entire length less thickened and clearly more reflected. *Napaeus consecoanus* (Mousson, 1872), *N. estherae* Artiles, 2013, and *N. zarzaliensis* spec. nov. are relatively much narrower, *N. bertheloti* (L. Pfeiffer, 1846) is more cylindrical with a shorter conical apex. *N. magnus* Yanes, Deniz, M. R. Alonso & Ibáñez, 2013 is more convex and wider, and has a relatively larger aperture. All other species are smaller, including *N. severus* (J. Mabilie, 1898) and *N. inflatiusculus* (Wollaston, 1878) which has about the same shape (Figs 14, 16). In cases where *N. consecoanus* tends toward the same shape, then the riblets in *N. consecoanus* are more irregular in thickness and spaced further apart. In such cases, the measurements are decisive as well. In *N. vanooijeni* spec. nov. the body whorl is relatively larger than in *N. consecoanus*. All *Napaeus* species from the Azores are much smaller.

Distribution. — *Napaeus vanooijeni* spec. nov. is only known from a fossil deposit in Barranco de la Era Nueva in Vallehermoso.

Napaeus ripkeni spec. nov.

Figs 8, 17-19

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Type locality. — East wall of Barranco de Monteforte in Hermigua, La Gomera, Canary Islands; the shells are found in



Figs 7-16. The larger species of *Napaeus* from La Gomera. **7:** *N. vanooijeni* spec. nov., holotype; **8:** *N. ripkeni* spec. nov., holotype; **9:** *N. zarzaliensis* spec. nov., holotype; **10:** *N. bertheloti* (L. Pfeiffer, 1846), Majona, San Sebastián de La Gomera; **11:** *N. consecoanus* (Mousson, 1872), Pie de la Cuesta, Vallehermoso; **12:** *N. magnus* Yanes, Deniz, M. R. Alonso & Ibáñez, 2013, Monte Calvario, Alajero; **13:** *N. estherae* Artiles, 2013, La Mérica, Valle Gran Rey; **14:** *N. severus* (J. Mabilie, 1898), between Hermigua and El Cedro; **15:** *N. servus* (Mousson, 1872), Las Casetas, San Sebastián de La Gomera; **16:** *N. inflatiusculus* (Wollaston, 1878), holotype, Degollada de la Cumbre. Photos 7-15: Ingrid Margry-Mooney; 16: courtesy of Amgueddfa Cymru - National Museum Wales, Cardiff (<https://gbmolluscatypes.ac.uk/specimens/1189>). Scale bar is 20 mm.

		Date	Figure	Height	Width	Width of body whorl above the aperture	Number of whorls	Body whorl to total height in %	Aperture height	Aperture width
<i>Napaeus van-ooijeni</i>	holotype	7.x.2022	2	23.4	11.5	10.4	7¾	63	9.8	7.2
	paratype	20.xi.2021	3	22.5	11.9	10.3	7½	65	9.4	7.4
	paratype	20.xi.2021	4	24.3	11.9	10.8	7¾	62	9.9	7.8
	paratype	7.x.2022	5	21.4*	11.2	10.1	7½*	64*	9.4	6.8
	paratype	7.x.2022	6	22.3*	10.8	10.0	7½*	66*	9.1	6.7
	mean			23.4	11.5	10.3	7¾	63	9.5	7.2
<i>Napaeus ripkeni</i>	holotype	19.xii.1985	17	22.6	11.2	10.3	8	62	9.7	7.3
	paratype	19.xii.1985	18	21.8*	10.6	9.7	-	-	9.0	6.7
	paratype	7.x.2022	19	-	10.4	9.8	-	-	9.5	7.5
	mean			22.6	10.7	9.9	8	62	9.4	7.2
<i>Napaeus santanabentezi</i>	holotype	20.x.2021	21	13.6*	5.2	4.7	-	-	4.3	3.2
	paratype	24.xii.2017	22	13.0*	5.0	4.4	-	-	4.3	3.1
	paratype	25.iv.2018	23	12.5*	5.1	4.3	-	-	3.9	3.2
	paratype	20.iv.2019	24	12.0**	5.1	4.5	-	-	3.9	3.1
	paratype	12.ii.2020	25	12.4*	4.8	4.5	-	-	4.0	2.7
	paratype	14.ix.2022	26	15.2*	4.9	4.5	-	-	4.2	3.1
	mean			-	5.0	4.5	-	-	4.1	3.1
<i>Napaeus zarzaliensis</i>	holotype	27.iv.2017	27	24.1	9.7	8.6	8¼	55	7.6	5.9
	paratype	11.i.2024	28	23.8	9.1	8.4	8½	55	-	-
	mean			24.0	9.4	8.5	8½	55	7.6	5.9

Table 1. Measurements of the four new species of *Napaeus*. * = indicates the missing of a part of the top of the shell, ** indicates the missing of a part of the top and the reflected peristome. These shells are not included in the mean of the height, the number of whorls, and the ratio of the body whorl to the height.



Figs 17-19. *Napaeus ripkeni* spec. nov. from La Gomera. **17a-e:** holotype RGM.1364050; **a:** frontal view with on the right side enlarged part of the riblets in 4 × 4 mm; **b:** side view; **c:** backside; **d:** dorsal side; **e:** ventral side. **18:** paratype RGM.1364051, Barranco de Monteforte. **19:** paratype RGM.1364052, Barranco de la Era Nueva. Scale bar is 20 mm; see also Table 1. Photos: Ingrid Margry-Moonen.

a fossil deposit next to the road CV-21, half a kilometer from the GM 1 exit (28.145824, -17.195233, alt 298 m a.s.l.)

Type material. — Holotype (RGM.1364050) found on 19.xii.1985, legit Th.E.J. Ripken, nr. LG138 (Figs 8, 17a-e). Paratypes: 19.xii.1985, Barranco de Monteforte, Hermigua, one specimen with broken top (RGM.1364051; Fig. 18); 7.x.2022, legit Kees Margry, Barranco de la Era Nueva: one broken specimen (RGM.1364052; Fig. 19). The holotype and paratypes are stored in the collection of Naturalis Biodiversity Center, Leiden, The Netherlands.

Description of the holotype (Figs 8, 17a-e, Table 1). — This shell belongs to one of the larger *Napaeus* species with its height of 22.6 mm and a width of 11.2 mm. The width of the body whorl above the aperture is 10.3 mm. From the apex, the conical shell becomes regular and noticeably wider and has 8 flattened to slightly convex whorls. The body whorl is about 62% of the total height. There is a clear but shallow suture. The aperture is oval and is 9.7 mm high and 7.3 mm wide. The peristome is thickened and reflected. On the parieto-palatal angle the peristome bends at an angle through a slit to a tooth-shaped parietal thickening. The umbilicus is closed. The protoconch is smooth, the teleoconch has oblique rather regular but small riblets which are variable in width. From the palatal side these riblets bend upward at an angle of approximately 60 degrees to the suture in the transition to the penultimate whorl. In this part are about 25 riblets in 4 mm length. On and between these riblets very small depressions are visible. The colour of the shell is light brown with a deposit of small brown to black spots. Some parts have an undamaged shiny surface. The shell is fragile.

Description of the paratypes. — As far as complete, the shells exhibit the same characteristics as the holotype. In both specimens the parietal thickening is slightly smaller than in the holotype (Figs 18-19).

Derivatio nominis. — The epithet *ripkeni* is derived from Theo (Th.E.J.) Ripken, the collector of the holotype and one of the paratypes.

Discussion. — *Napaeus ripkeni* spec. nov. is one of the largest *Napaeus* species and can be distinguished from all other species of *Napaeus* in the same way as *N. vanooijeni* spec. nov. The difference with respect to *N. vanooijeni* spec. nov. lies in the thicker peristome and the transition in the parieto-palatal angle to the parietal thickening. In addition, the riblets on the whorls are less inclined to the axis of the shell. On parts closer to the umbilicus area, there is no irregular pattern with undulating riblets. The aperture of *N. ripkeni* spec. nov. is less oblique, and its peristome is less well reflected. The shell of *N. ripkeni* spec. nov. has at the same height 0.5 less whorls.

Distribution. — *Napaeus ripkeni* spec. nov. is known from fossil deposits in Barranco de Monteforte (Hermigua) and Barranco de la Era Nueva (Vallehermoso).

***Napaeus santanabentezi* spec. nov.**

Figs 20, 21-26

urn:lsid:zoobank.org:act:EB3D286B-1291-45F1-88C2-63BFDB5B109F

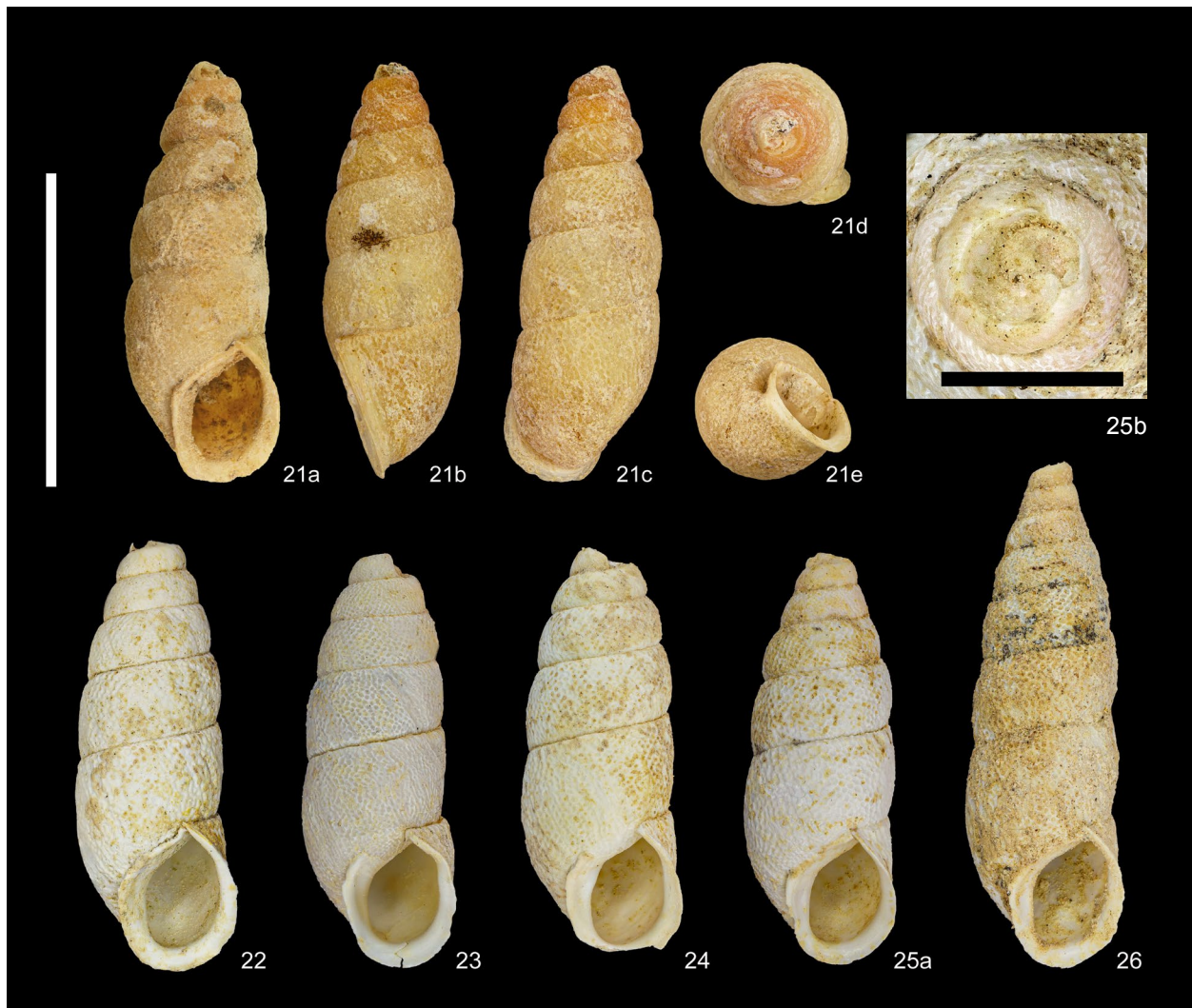
Type locality. — Barranco de los Zarzales, north of Pie de la Cuesta (Tamargada), La Gomera, Canary Islands (28.194963, -17.248000, 143 m a.s.l.). Found in a fossil deposit on the western side of the valley, a few meters below the footpath to the beach of Playa Vallehermoso (Fig. 20).

Type material. — Holotype (RGM.1364053) found on 20.x.2021, legit Ingrid Margry (Figs 21a-e). Paratypes (Figs 22-26): 24.xii.2017: 2 specimens, one of which is incomplete (RGM.1364054); 25.iv.2018: 2 specimens, one of which is incomplete (RGM.1364055); 20.iv.2019: 1 specimen (RGM.1364056); 12.ii.2020: 1 specimen (RGM.1364057); 14.ix.2022: 1 specimen (RGM.1364058). All paratypes are found on the type locality within a few square meters. In addition to these paratypes, several separate parts have been found as well, all found by Ingrid and Kees Margry. The holotype and paratypes are stored in the collection of Naturalis Biodiversity Center, Leiden, The Netherlands.

Description of the holotype (Figs 21a-e, Table 1). — The elongated shell has a height of 13.6 mm and a width of 5.2 mm. The width of the body whorl above the aperture is 4.7 mm. From the apex, the shell becomes regular wider and has slightly convex whorls. Due to the absence of a small part of the apex, the number of whorls cannot be determined exactly and is estimated at 6½. The body whorl is about 50% of the total height. There is a distinct suture. The aperture is oval angular U-shaped and is 4.3 mm high and 3.2 mm wide. The peristome is reflected and continues as a clear ledge over the parietal side where it makes an



Fig. 20. Type locality from *Napaeus santanabentezi* spec. nov. and *N. zarzaliensis* spec. nov. in Barranco de los Zarzales, Vallehermoso. Photo: Ingrid Margry-Moonen.



Figs 21-26. *Napaeus santanabenitezi* spec. nov. from La Gomera. **21a-e:** holotype RGM.1364053; **a:** frontal view; **b:** side view; **c:** backside; **d:** dorsal side; **e:** ventral side. **22-26:** paratypes; **22:** RGM.1364054; **23:** RGM.1364055; **24:** RGM.1364056; **25a-b:** RGM.1364057 (b = apex, scale bar is 2 mm); **26:** RGM.1364058. Scale bar is 10 mm; see also Table 1. Photos: Ingrid Margry-Moonen.

angle with the palatal side. On this place there is a small bulge. The umbilicus is closed. The teleoconch has pits that get bigger and bigger from the top. On the body whorl, the edges of these pits increasingly form an erratic pattern. The pits are missing in the oblique interruptions that mark the transition to another life year. The top whorls have a faint orange colour. The colour of the other whorls is white to light yellow. On several parts, the surface is shiny.

Description of the paratypes (Figs 22-26, Table 1). — All paratypes show the same characteristics as pits on the teleoconch, the oval angular U-shaped aperture, and the reflected peristome. On all shells and parts of it, the apex is missing. One specimen is slenderer (Fig. 26).

Derivatio nominis. — The epithet *santanabenitezi* is derived from Jesús Santana Benitez, a medical doctor from Gran Canaria who has meant a lot to the malacology of the Canary Islands and the Azores.

Discussion. — The combination of its size, shape and pitted surface distinguishes the new species from all other species. *Napaeus santanabenitezi* spec. nov. has a resemblance to *N. ornamentatus* Moro, 2009. However, the new species has pits and *N. ornamentatus* has irregular undulating ribs that often touch. In older worn specimens, this often results in a pattern of irregular pits that, however, does not correspond to the pits of *N. santanabenitezi* spec. nov. In comparison with *N. ornamentatus*, the parietal side in *N. santanabenitezi* spec. nov. is relatively shorter. *N. taguluchensis* Henríquez, 1993 also has pits but is less elongated and has a characteristic pinched apex. *N. gomerensis* G.A. Holyoak & D.T. Holyoak, 2011 has a larger oblique aperture. *N. maculatus* Goodacre, 2006, *N. ocellatus* (Mousson, 1872), *N. rupicola* (Mousson, 1872) and *N. torilensis* Artiles & Deniz, 2011 have a more pointed shell and smooth whorls. The fossil *Napaeus lajaensis* Castillo, Yanes, M. R. Alonso & Ibáñez,

2006 differs from the new species because the body whorl is laterally tilted 45° - 52° , and there is a prominent torus on that sharp edge. Also present on the base of the body whorl is a second spiral torus, surrounding partially the umbilicus. *Napaeus lipauges* Miller, Carillo & Castillo, 2022 is a little longer, but mainly different in shape due to the more conical shell and the large aperture. *Napaeus* species from the Azores are missing the pits or do not have such a slender shell.

The shell of *N. santanabenitezi* spec. nov. is very fragile. The connection at the suture is weak. In all collected specimens the top is missing. This could be due to decollation, where the snail deliberately loses its top, leaving a closed plate behind as has been found in *N. taguluchensis*. In one paratype (Fig. 25a), the top has a closed decollated appearance (Fig. 25b).

Distribution. — *Napaeus santanabenitezi* spec. nov. is known from one fossil deposit in Barranco de los Zarzales, Vallehermoso.

***Napaeus zarzaliensis* spec. nov.**

Figs 9, 20, 27-28

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Type locality. — Barranco de los Zarzales, north of Pie de la Cuesta (Tamargada), La Gomera, Canary Islands (28.194963, -17.248000, 143 m a.s.l.). Found in a fossil deposit on the western side of the valley, a few meters below the footpath to the beach of Playa Vallehermoso (Fig. 20).

Type material. — Holotype (RGM.1364059) found on 27.iv.2017, legit Kees Margry (Figs 9, 27a-e). One damaged paratype (RGM.1364060), found on 11.i.2024, between Playa Vallehermoso and Montaña Alcalá, La Gomera, Canary

Islands, Spain, in a fossil wall at 564 m altitude, 28.207750, -17.262833, legit Ingrid Margry (Fig. 28). The holotype and paratype are stored in the collection of Naturalis Biodiversity Center, Leiden, The Netherlands.

Description of the holotype (Figs 9, 27a-e, Table 1). — This species belongs to one of the larger *Napaeus* species and has a height of 24.1 mm and a width of 9.7 mm. The width of the body whorl above the aperture is 8.6 mm. The shell is elongated conical with a rather pointed apex. From the apex, the shell becomes regular wider and has $8\frac{1}{4}$ whorls. The upper whorls are more flattened, the penultimate whorl and the body whorl are more convex. The body whorl is about 55% of the total height. There is a distinct suture. The aperture is relatively small; it is 7.6 mm high and 5.9 mm wide, and it is oval to almost circular. The apertural margin is reflected only on the basal and the palatal side but demolished. It is closed around and even covering the parietal side except for a little piece in the middle, where the edge is broken away. The upper palatal angle is almost horizontal and has a small bulge at the transition to the parietal side. The umbilicus is closed. The protoconch is smooth. The surface of the upper whorls has fine oblique irregular ribs. On the penultimate whorl and the body whorl those ribs are alternated with more coarse ribs, especially on the backside of the body whorl. There is no sign of any colour.

Description of the paratype (Fig. 28a-b). — The paratype is almost similar to the holotype. The shell is slightly narrower, has more colour due to alternating dirty white and brown riblets on the side of the last whorl (Fig. 28b). The aperture of the shell is damaged so not all measurements could be taken. However, the characteristic roundness of the palatal-parietal area is clearly recognizable. The shell is very fragile.

Derivatio nominis. — The epithet *zarzaliensis* is derived from Barranco de los Zarzales where the holotype is found.



Figs 27-28. *Napaeus zarzaliensis* spec. nov. from La Gomera. **27a-e:** holotype RGM.1364059, Barranco de los Zarzales; **a:** frontal view; **b:** side view; **c:** backside; **d:** dorsal side; **e:** ventral side. **28a-b:** paratype RGM.1364060, Montaña Alcalá; **a:** frontal view; **b:** side view. Scale bar is 20 mm; see also Table 1. Photos: Ingrid Margry-Moonen.

Discussion. — This fossil species resembles *N. conseqoanus* (Mousson, 1872), *N. servus* (Mousson, 1872) and *N. estherae* Artiles, 2013, which all are endemic for La Gomera. But the new species has a slenderer shell than *N. conseqoanus* and *N. servus* and it exceeds the size of *N. servus* and *N. estherae*. The apex is more pointed than in *N. estherae*. The shell has a relative smaller and rounder aperture than all the three mentioned species. None of the larger Canarian *Napaeus* species have an almost circular apertural margin. All *Napaeus* species from the Azores are much smaller and are missing the circular apertural margin as well.

Distribution. — *Napaeus zarzaliensis* spec. nov. is known from one fossil deposit in Barranco de los Zarzales and a fossil deposit on Montaña Alcalá, both in Vallehermoso.

FINAL REMARKS

The type localities in Barranco de la Era Nueva and Barranco de los Zarzales probably concern a quaternary fossil bed. According to Groh (1985: 407), on the Canary Islands such layers on slopes and in secondary troughs concern colluvial debris. On both localities, an interesting thanatocoenosis is recorded as well. In Barranco de la Era Nueva, 130 specimens of *Canaridiscus gomerensis* (Rähle, 1994) were collected. Close to this locality is the record of the only fossil specimen from *Insulivitrina ingridae* Margry, 2016. In Barranco de los Zarzales, next to *N. zarzaliensis* spec. nov. and *N. santanabenitezi* spec. nov., *Planellavitrina occulta* Margry, 2018 is found.

With the four new species, in total 76 *Napaeus* species including six fossil species are known from the Canary Islands and 31 *Napaeus* species including four fossil species from La Gomera.

All new four *Napaeus* species from La Gomera do not fit in the description and measurements of two unidentified fossil *Napaeus* in Talaván Serna & Talaván Gómez (2008: 215). This suggests that more species of *Napaeus* can be found on the Canary Island of La Gomera.

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REFERENCES

- ALBERS, J.C., 1850. Die Heliceen, nach natürlicher Verwandtschaft systematisch geordnet: 262 pp. – Th. Chr. Fr. Enslin, Berlin.
- ALONSO, M.R., HENRÍQUEZ, F. & IBÁÑEZ, M., 1995. Revision of the species group *Napaeus variatus* (Gastropoda, Pulmonata, Buliminidae) from the Canary Islands, with description of five new species. – *Zoologica Scripta*, 24 (4): 303-320.
- ALONSO, M.R., GOODACRE, S.L., EMERSON, B.C., IBÁÑEZ, M., HUTTERER, R. & GROH, K., 2006. Canarian land snail diversity: conflict between anatomical and molecular data on the phylogenetic placement of five new species of *Napaeus* (Gastropoda, Pulmonata, Enidae). – *Biological Journal of the Linnean Society*, 89 (1): 169-187.
- ALONSO, M.R. & IBÁÑEZ, M., 2015. Las especies de la familia Enidae B.B. Woodward, 1903 (1880) (Mollusca, Gastropoda, Stylommatophora) de las islas Canarias: el género *Napaeus* Albers, 1850. – *Vieraea*, 43: 153-188.
- BACKHUYS, W., 1975. Zoogeography and taxonomy of the land and freshwater molluscs of the Azores: i-xii, 1-350, maps 1-97, pls 1-32. Backhuys & Meesters, Amsterdam.
- BANK, R.A., GROH, K. & RIPKEN, T.E.J., 2002. CLECOM-Project. Catalogue and bibliography of the non-marine Mollusca of Macaronesia: 89-235, pls 14-26. – In: FALKNER, M., GROH, K. & SPEICHT, M.C.D. (eds), *Collectanea Malacologica*. Festschrift für Gerhard Falkner. ConchBooks, Hackenheim.
- BECK, T. & RÄHLE, W., 2006. Description of a newly discovered extinct representative of the genus *Hemicycla* Swainson, 1840 (Gastropoda, Pulmonata, Helicidae) from La Gomera, Canary Islands. – *Basteria*, 70 (1/3): 53-56.
- CASTILLO, C., YANES, Y., ALONSO, M.R. & IBÁÑEZ, M., 2006. *Napaeus lajaensis* sp. nov. (Gastropoda: Pulmonata: Enidae) from a Quaternary aeolian deposit of Northeast Tenerife, Canary Islands. – *Zootaxa*, 1307 (1): 41-54.
- GROH, K., 1985. Landschnecken aus quartären Wirbeltierfundstellen der Kanarischen Inseln (Gastropoda). – *Bonner Zoologische Beiträge*, 36 (3/4): 395-415.
- GROH, K., ALONSO, M.R., IBÁÑEZ, M. & HENRIQUEZ, F.C., 1992. Rediscovery of *Hemicycla saulcyi* (d'Orbigny, 1839), a revision of its fossil allies (Gastropoda: Helicidae), and description of a new species of *Napaeus* (Enidae), both from La Isleta, Gran Canaria, Canary Islands. – *Schriften zur Malakozoologie*, 5: 1-12, pls 1-3.
- HELIXEBAS, 2023. Lista de la Península Ibérica e Islas. Retrieved August 30, 2023, from <https://www.malacowiki.org/>
- HENRIQUEZ, F.C., ALONSO, M.R. & IBÁÑEZ, M., 1993a. Estudio de *Napaeus baeticatus* (Férussac) (Gastropoda Pulmonata: Enidae) y descripción de dos nuevas especies de su grupo conquiológico. – *Bulletin du Muséum National*

- d'Histoire Naturelle de Paris, (4) 15 A (1/4): 31-47.
- HENRÍQUEZ, F. C., IBÁÑEZ, M. & ALONSO, M.R., 1993b. Revision of the genus *Napaeus* Albers, 1850 (Gastropoda Pulmonata: Enidae). The problem of *Napaeus* (*Napaeinus*) *nanodes* (Shuttleworth, 1852) and description of five new species from its conchological group. – Journal of Molluscan Studies, 59 (2): 147-163.
- HERRMANNSEN, A.N., 1852. Indices generum malacozoorum primordia. Nomina subgenerum, generum, familiarum, tribuum, ordinum, classium; adjectis auctoribus, temporibus, locis systematicis atque literariis, etymis, synonymis. Praetermittuntur Cirripedia, Tunicata et Rhizopoda. Supplementa et corrigenda: I-V, 1-140. Fischer, Cassel.
- HOLYOAK, G.A., HOLYOAK, D.T., YANES, Y., ALONSO, M.R. & IBÁÑEZ, M., 2011. Two new *Napaeus* species from La Gomera and La Palma (Canary Islands) (Gastropoda: Pulmonata: Enidae). – Archiv für Molluskenkunde, 140 (1): 37-48.
- MILLER, J.P., CRUZADO-CABALLERO, P., NUEZ, J. DE LA, CARRILLO PACHECO, M. & CASTILLO RUIZ, C., 2022. Review of the Middle Pleistocene molluscan association from La Mancha de la Laja, Tenerife, Spain, with the description of two new species of *Napaeus* Albers, 1850 (Gastropoda: Enidae). – Historical Biology, 35 (1): 1-14.
- NORDSIECK, H., 2014. Annotated check-list of the genera of fossil land snails (Gastropoda: Stylommatophora) of western and central Europe (Cretaceous – Pliocene), with description of new taxa. – Archiv für Molluskenkunde, 143 (2): 153-185.
- SANTANA, J., ARTILES, M., YANES, Y., DENIZ, F., ALONSO, M.R. & IBÁÑEZ, M., 2013. Three undescribed species of *Napaeus* (Gastropoda: Pulmonata: Enidae) from La Gomera (Canary Islands), the richest centre of species radiation for the genus. – Journal of Conchology, 41 (3): 271-286.
- TALAVÁN SERNA, J. & TALAVÁN GÓMEZ, J., 2008. Contribución al conocimiento de los moluscos fósiles de las Islas Canarias. – Spira, 2 (4): 199-221.
- WOLLASTON, T.V., 1878. Testacea Atlantica or the land and freshwater shells of the Azores, Madeiras, Salvages, Canaries, Cape Verdes, and Saint Helena: i-xiv, 1-588. L. Reeve & Co., London.
- YANES, Y., MARTÍN, J., MORO, L., ALONSO, M.R. & IBÁÑEZ, M., 2009. On the relationships of the genus *Napaeus* (Gastropoda: Pulmonata: Enidae) with the descriptions of four new species from the Canary Islands. – Journal of Natural History, 43 (35/36): 2179-2207.
- YANES, Y., SANTANA, J., ARTILES, M., DENIZ, F., MARTÍN, J., ALONSO, M.R. & IBÁÑEZ, M., 2011a. Five new *Napaeus* species (Gastropoda: Pulmonata: Enidae) from Gran Canaria and El Hierro (Canary Islands). – Zootaxa, 2901: 35-51.
- YANES, Y., MARTÍN, J., SANTANA, J., HOLYOAK, G.A., HOLYOAK, D.T., ARTILES, M., DENIZ, F., ALONSO, M.R. & IBÁÑEZ, M., 2011b. Four new *Napaeus* species (Gastropoda: Pulmonata: Enidae) from La Gomera (Canary Islands). – Journal of Conchology, 40 (4): 393-407.