BASTERIA, 53: 117-125, 1989

Helix pavida Mousson, 1872, and H. nubivaga Mabille, 1882 (Gastropoda Pulmonata: Helicidae), poorly known Helicellinae from the Canary Islands[1]

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According to the structure of the genitalia *Helix pavida* and *H. nubivaga* should be considered separate *Xerotricha* species. Both species are morphologically extreme among the Helicellinae because of their fragile, corneous shells, with periostracal hairs and without any trace of spiral bands or flecking.

Key words: Gastropoda, Pulmonata, Helicidae, Helicellinae, *Xerotricha*, taxonomy, Canary Islands.

INTRODUCTION

From high altitudes on the two Canary Islands La Palma and Tenerife small helicid snails have been reported by Mousson (1872) and Mabille (1882). Their shells are depressed, very fragile and covered with curved hairs. The generic assignment remained problematic up till now. It has also been a matter of dispute whether the same species occurs on both islands. If not, the epithet *pavida* should be used for the species from La Palma and *nubivaga* for the one from Tenerife. Wollaston (1878: 385), who himself collected material of the problematic snails on both islands, considered them conspecific, but material collected recently by Alonso and Ibañez, and Hovestadt and Ripken has convinced us that two species are involved.

As far as known at present, the species in question should be looked upon as conchologically somewhat aberrant representatives of the Helicellinae. Their shell characters support the view that the (or various groups of the) Helicellinae might have had ancestral species with corneous, rather fragile, shells, which are covered with hairs. The course of the penial nerve could not be located with certainty. However, according to the structure of the genitalia and the position of the right ommatophoran retractor muscle, the species in question are classified with *Xerotricha* Monterosato, 1892, next to *X. conspurcata* (Draparnaud, 1801) and *X. apicina* (Lamarck, 1822). For arguments underlying this view, we refer to Hausdorf (1988) and especially to Giusti & Manganelli (1989), who most recently dealt with the relation between the nominal taxa *Xerotricha* and *Xeromicra* Monterosato, 1892.

We are grateful to Messrs. A. Hovestadt and Th. E. J. Ripken, who most kindly enabled us to study their material from La Palma.

[1] Notes on the malacofauna of the Canary Islands, No. 13 [No. 12: *Malacolimax wiktori* n. sp., un nuevo limácido (Gastropoda, Pulmonata) de Tenerife (Islas Canarias). — Bull. Mus. natn. Hist. nat. Paris (4) 11, A (2): 307-313 (1989)].

For collections the following abbreviations are used: DZUL, Universidad de La Laguna, Tenerife, Canary Islands, Spain; RMNH, Rijksmuseum van Natuurlijke Historie, Leiden, The Netherlands; SMF, Forschungsinstitut und Natur-Museum Senckenberg, Frankfurt am Main, Federal Republic Germany.

SYSTEMATIC PART

Xerotricha nubivaga (Mabille, 1882)
(figs. 1-10, 13)

Helix nubigena Lowe, 1861: 105 ("...in excelsioribus 'Cumbre v. Cañadas' dictis montis 'Pico de Teyde' Tenerifae"). Pfeiffer, 1872: 80, pl. 122 figs. 22-24. Not *H. nubigena* De Saulcy, 1852 (= *Helicella itala nubigena*).

Helix nubivaga Mabille, 1882: 133 ("Ténériffe"); 1885: 63.

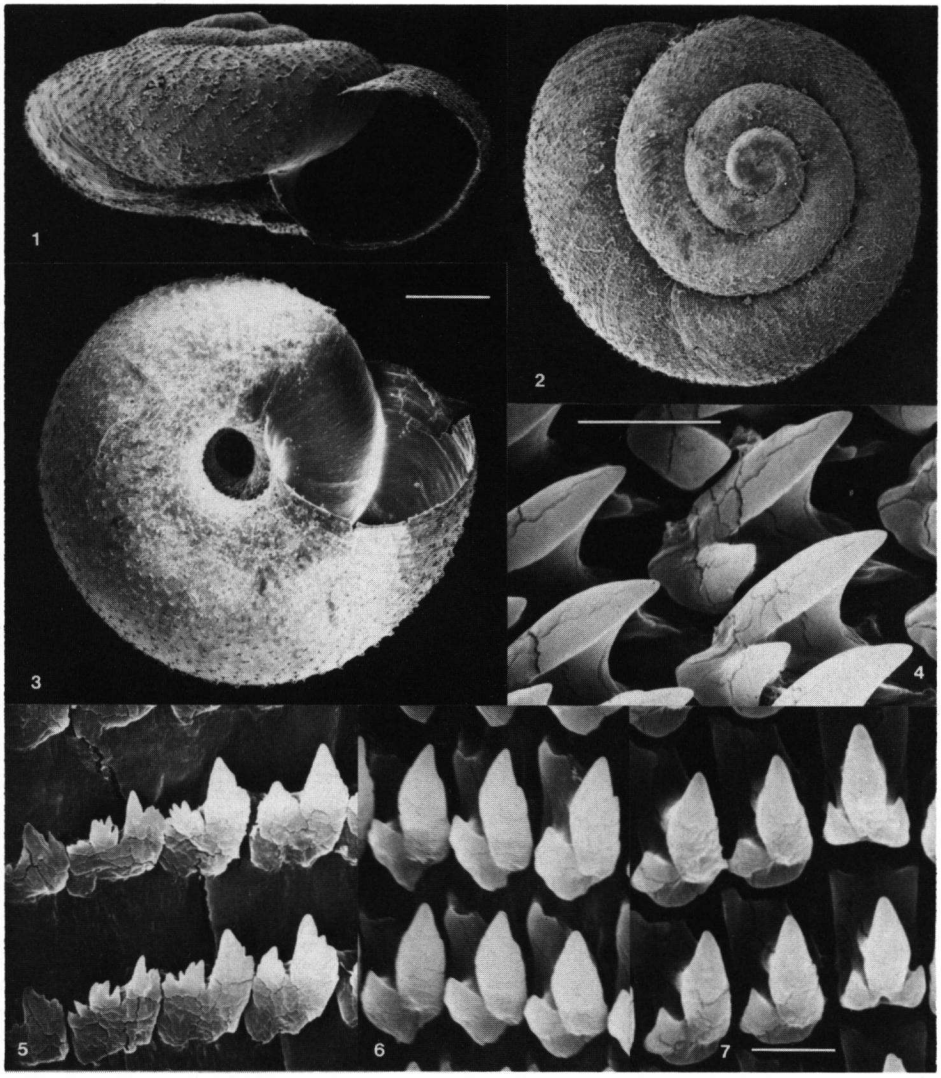
Material (fig. 13). — Tenerife: along the road from Vilaflor to Cañadas del Teide near the Lomo del Retamar [km 56'5] (UTM: 28R CS3520), alive under stones at 2200 m alt., Alonso & Ibañez leg., 17.ii.1984 (DZUL/18; RMNH/14; SMF/4); Cañada de los Guancheros (UTM: 28R CS4432), empty shells under stones, Carmelo Prendes leg. (DZUL/2).

Shell (figs. 1-3). — The pale yellowish to olivaceous-brown, very fragile and transparent shell is strongly depressed; it has $3^1/_2$ to $4^1/_4$ moderately inflated whorls and a bluntly angled periphery. The circular umbilicus measures $^1/_6$-$^1/_7$ of the total shell diameter. Apart from the parietal interruption, the aperture is oval in outline. There is no trace of a thickened apertural lip. The entire teleoconch shell is sculptured with inconspicuous growth-lines and even finer spiral striae; it is additionally covered by a lustreless, granulated periostracum with strongly curved, tapering hairs with relatively broad bases, which leave regularly arranged, conspicuous hair-pits on the shell surface when removed; because of the curvature of the hairs their tips often touch the shell surface. Near the periphery of the body whorl the hairs are 0.15-0.20 mm long and c. 0.2 mm apart from each other.

The shells are up to 5.3 mm broad and 2.6 mm high.

Shells of *X. conspurcata* are usually not corneous all over, but provided with (traces of) banding and some whitish flecking; the body whorl is relatively higher and, as a consequence, the aperture is more roundish (see e.g. Kerney & Cameron, 1979: pl. 15 fig. 8a, b). *X. apicina* is even more clearly different conchologically because of its strongly inflated body whorl with a circular aperture (see e.g. Kerney & Cameron, 1979: pl. 15 fig. 4a, b). *Xerosecta* (*Microxeromagna*) *armillata* (Lowe, 1852) [= *arrouxi* Bourguignat, 1863, *vestita* Rambur, 1868, *stolismena* Servain, 1880 (after Gittenberger, in prep.)] is another conchologically somewhat similar species known from the Canary Islands; its shells can be recognized by the dense cover of very short, straight hairs.

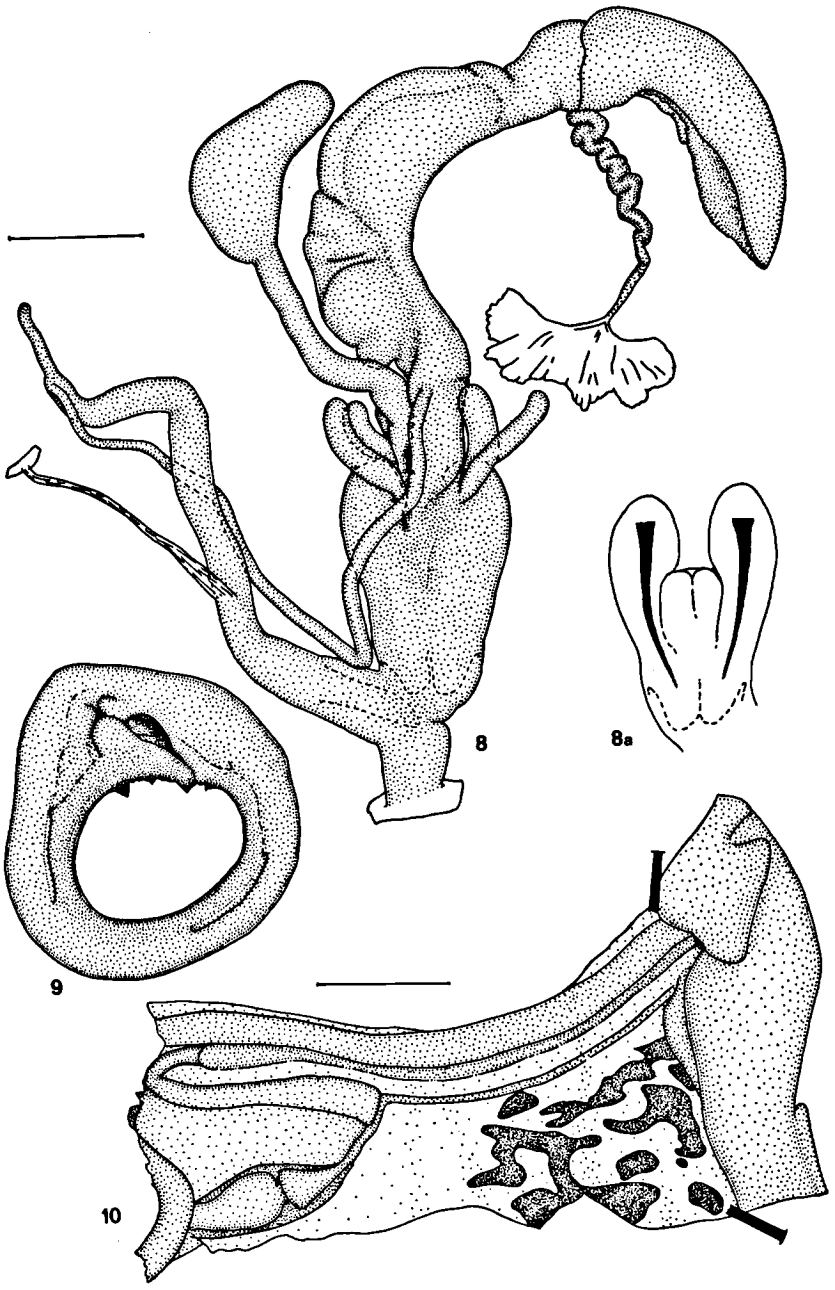
Genitalia (fig. 8). — We have dissected six specimens. The right ommatophoran retractor muscle does not cross between penis and vagina. The slender flagellum measures about a quarter of the length of the epiphallus, which is more than one and a half times as long as the penis. (The penial nerve could not be located with certainty). There are two symmetrical dart-sacs, which are somewhat longer than the penis. They insert low on the vagina, thus very close to the genital atrium. In situ the tips of the darts remain far apart; the internal free dart hull ("Hülse": Hausdorf, 1988: 13) (indicated by dotted lines in fig. 8, 8a) measures about $^1/_5$ of the total dart sac length. In addition there are two considerably less conspicuous accessory sacs, somewhat hidden by connective tissue. Just below the insertion of the spermathecal



Figs. 1-7. *Xerotricha nubivaga* (Mabille), Tenerife, along the road from Vilaflor to Cañadas del Teide near the Lomo del Retamar, 2200 m alt., Alonso & Ibáñez leg. 1-3, shells (scale line 1 mm); 4-7, details of the radula (scale lines 10 μm), with lateral teeth [4], central tooth with the initial two lateral teeth [7], lateral teeth 6-8, from right to left [6], and marginal teeth 16-19 [5].

duct there are three relatively short mucous glands, which are split up into five branches, measuring about one third of the length of the spermathecal duct. The spermathecal duct is clearly longer than the vagina and about as long as the epiphallus; the largest diameter of the elongated spermatheca is more than half as long as its duct.

Mantle collar (fig. 9). — The mantle collar is not provided with conspicuous lobes.



Figs. 8-10. *Xerotricha nubivaga* (Mabille), Tenerife, along the road from Vilaflor to Cañadas del Teide near the Lomo del Retemar, 2200 m alt., Alonso & Ibáñez leg. 8, genitalia, with a detail of the dart sacs (8a) with darts in situ, and the outline of the penial papilla and the free dart hulls indicated by dotted lines; 9, mantle collar; 10, pallial region. (Scale lines 1 mm).

It has a low and very thin, left lateral lobe and an equally obsolete right lateral one. Both lobes are separated ventrally by a regularly rounded zone of the mantle collar; more dorsally, towards the pneumostome, the collar is angulate. The subpneumostomal mantle lobe has a semicircular right part, which is about twice as large as the adjoining right dorsal lobe.

Pallial region (fig. 10). — The pallial region extends for about half a whorl apically. The lung roof and the rest of the skin, i.e. the surface of all the 2¼ whorls of the visceral mass, have a conspicuous, very irregular pattern of blackish pigment markings (only partially indicated on fig. 10). The heart is about as long as two thirds of the length of the kidney, which is somewhat shorter than half the length of the lung roof. The broad primary ureter is situated on the kidney. The secondary ureter opens opposite c. the middle of the ventricle of the heart.

Radula (figs. 4-7). — In one specimen the radula has been studied. Next to the tricuspid central tooth there are 19 teeth, most of which are bicuspid. Only in the three most marginal teeth the side cusp is split.

Ecology. — *Xerotricha nubivaga* lives in the Cañadas del Teide and its surroundings at 1900-2300 m altitude approximately, in xeric zones with a high average amount of insolation, where the dayly fluctuation in temperature is c. 20°C. The vegetation is high-mountain brushwood, with Canarian broom [*Spartocytisus supranubius* (L.Gil.)], *Adenocarpus viscosus* (Willd.), *Descurainia bourgeauana* (Fourn.), etc.

Notes. — While describing *Helix nubivaga*, Mabille (1882: 133) did not indicate that he introduced the new name because of homonymy; he did so only in 1885.

See also the notes on *Helix pavida.*

Xerotricha pavida (Mousson, 1872)
(figs. 11, 12, 14)

Helix pavida Mousson, 1872: 56 ("au-dessus de Buonavista, Palmae"). Mabille, 1885: 64.

Material (fig. 14). — La Palma: Cañón Martín [UTM: 28R BS2258], 1590 m alt., Pedro Oromí leg., 19.viii.1986 (DZUL/2; RMNH/2); Barranco del Carmen Dorador, 1 km NNE of Las Nieves [UTM 28R BS2877], 270 m alt., relatively humid grassy site in open *Pinus*-wood, A. Hovestadt & Th. E.J. Ripken leg., 8.iv.1989 (RMNH/4 specimens in alcohol and 6 empty shells in the collections of the collectors).

Shell. — Conchologically *X. pavida* can hardly be distinguished from *X. nubivaga*. Only the hairs are less narrowly curved and slightly longer in *X. pavida*; their tips do not touch the shell and they cover the shell surface less densely. Near the periphery of the body whorl the hairs are 0.2-0.3 mm long and situated at distances of 0.25-0.45 mm from each other.

See also the description of the previous species.

Genitalia (figs. 11, 12). — The two specimens that were studied, one from each locality, differ from material of *X. nubivaga* most clearly by the relatively long and slender dart-sacs, which are provided with long darts with in situ crossing tips. The spermathecal duct is relatively broad and the spermatheca is more regularly oval to roundish in shape. At one site three mucous glands insert, one of which is split over nearly its entire length in one of the specimens; at the opposite site there is only a single mucous gland. The branches of the mucous glands are (nearly) as long as the spermathecal duct in one specimen and about half this length in the other one.

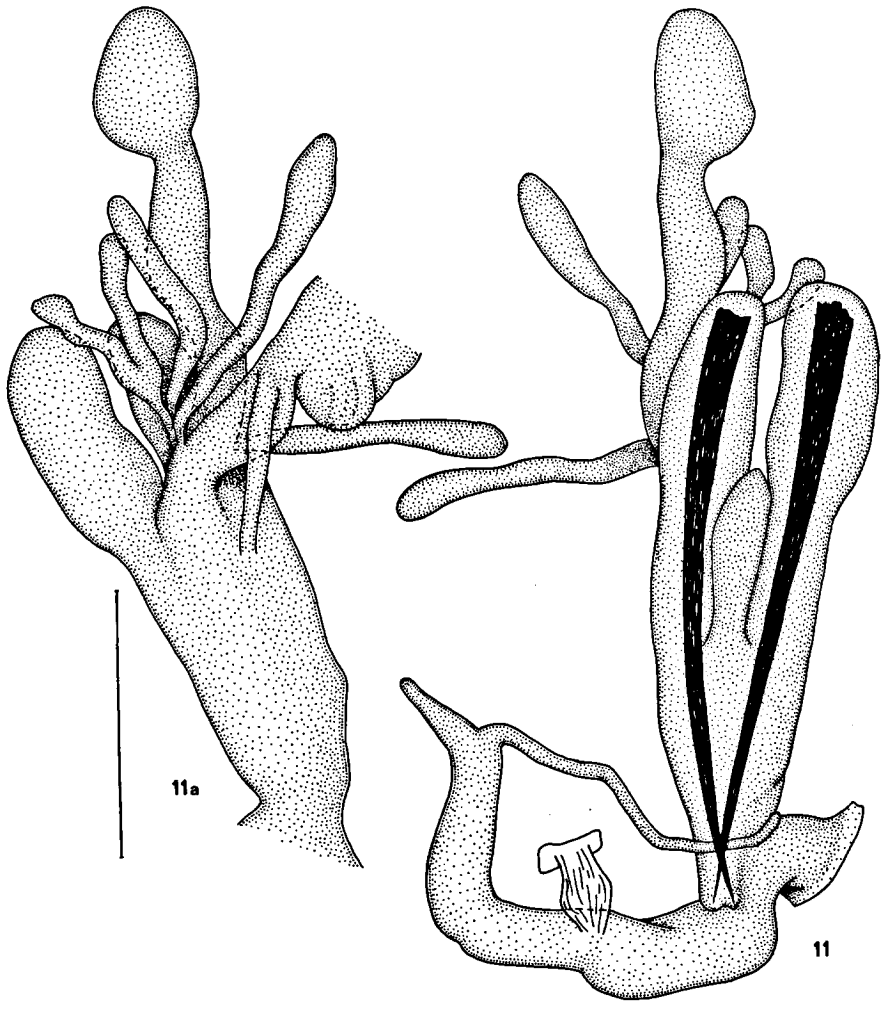


Fig. 11. *Xerotricha pavida* (Mousson), two views of the genitalia, one of which (11) with the darts indicated in situ (scale line 1 mm); La Palma, Cañón Martín, 1590 m alt., Pedro Oromí leg.

In this species we noticed nerve fibres that might run from the pedal ganglion towards the penis. However, according to Hausdorf (1988: 14), the presence of nerve fibres between the cerebral ganglion and the penis is diagnostic for *Xerotricha*. Whether the latter connections are lacking, cannot yet be stated with certainty.

Ecology. — *X. pavida* is known from two localities, which are situated at 270 m (relatively humid, grassy site in open *Pinus*-wood) and 1590 m altitude, respectively. See further the notes.

Notes. — Mousson (1872: 56) described *Helix pavida* from La Palma, next to *Helix nubigena* from Tenerife, after two immature shells, collected by Wollaston. Wollaston

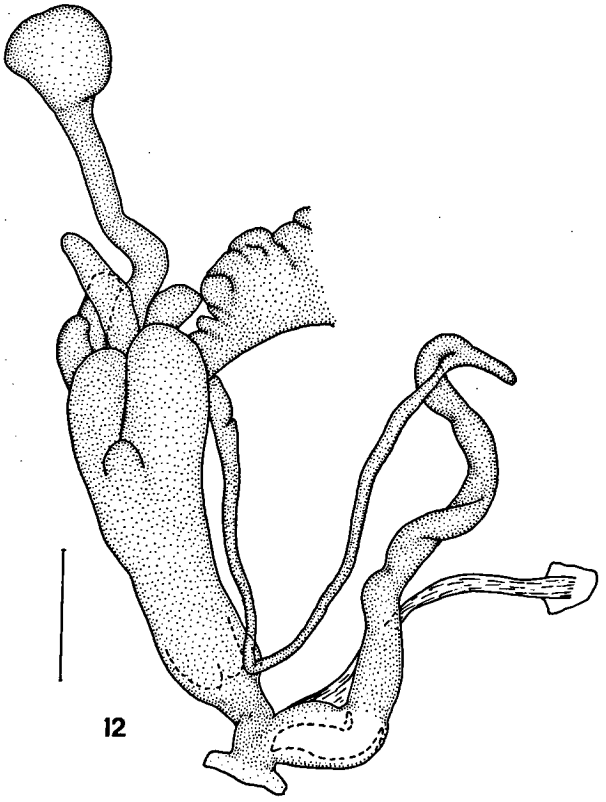
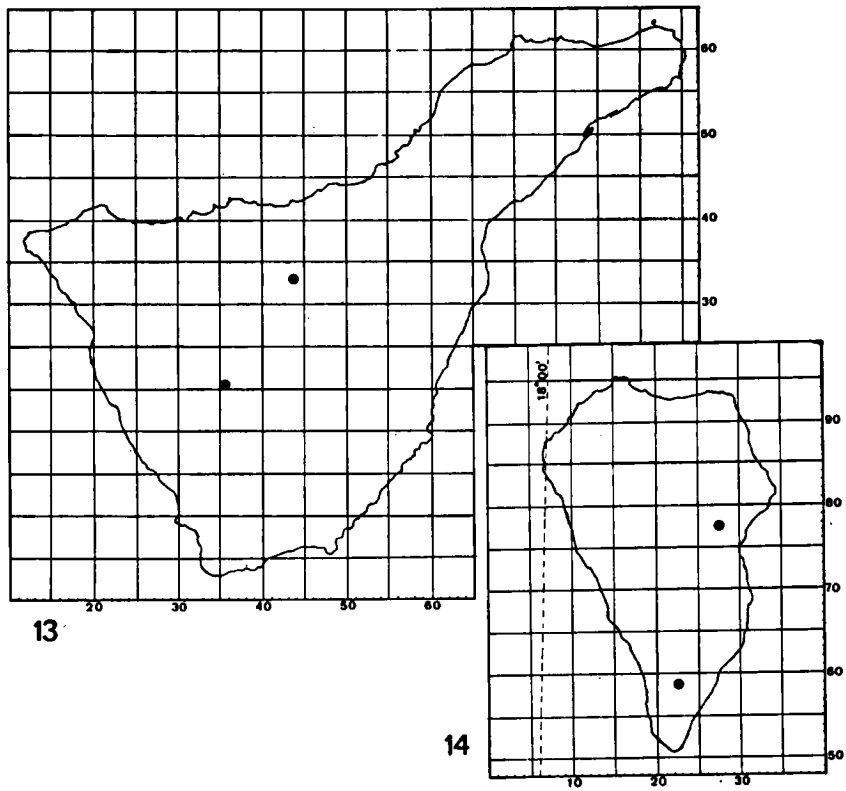


Fig. 12. *Xerotricha pavida* (Mousson), genitalia, with the profile of the penial papilla and the free dart hulls indicated by dotted lines (scale line 1 mm); La Palma, Barranco del Carmen Dorador, 1 km NNE of Las Nieves, 270 m alt., A. Hovestadt & Th. E. J. Ripken leg.

as well as Lowe, who had seen these two syntypes, considered them juvenile specimens of the species from Tenerife (Wollaston, 1878: 386), both for morphological and ecological reasons. Mabille (1885: 64), a well-known splitter, who introduced large numbers of unnecessary names, followed Mousson in accepting the existence of different species. The results of our anatomical studies convinced us that this opinion is the correct one, although it was based on incorrect conchological arguments.

The radula has not been studied in this species. The pallial region proved to be virtually identical with that of *X. nubivaga*. The mantle collar differs especially by the presence of a much more prominent right lateral lobe.

Odhner (1931: 77) suggested that *Xerotricha conspurcata* (Draparnaud, 1801) and *Xerotricha pavida* might be identical. He collected specimens considered conchologically intermediate between these two taxa and anatomically belonging to the former, well-known European species, at a locality from which Wollaston reported the latter one. Conchologically *X. conspurcata* can be distinguished from both *X. nubivaga* and *X. pavida* by the characters indicated before, whereas anatomically it differs by e.g. the accessory sacs of the female part of the genitalia, which are (considerably) less easily discernible



Figs. 13, 14. UTM 5 km-grid maps, with the reliable localities of *Xerotricha nubivaga* (Mabille) on Tenerife (13) and *X. pavida* (Mousson) on La Palma (14), respectively.

from outside (see Giusti & Manganelli, 1989). Odhner might have seen real *X. conspurcata* from La Palma, however. Typical shells of this species were collected by Hovestadt and Ripken at a relatively dry site along the road to Los Cancajos, near the cross-road to San Carlos [UTM 28R BS3076].

In the northwestern part of La Palma, Hovestadt and Ripken collected a few shells of a problematic, small helicid snail, which is similar to, but maybe not identical with, *X. pavida*; this material will be dealt with separately. In the same area, in the Barranco de Briestas, between Los Riveroles and Llano Negro, at 1490 m altitude, they found shells of *Xerosecta* (*Microxeromagna*) *armillata*.

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