

New terrestrial Gastropoda (Mollusca) from Seychelles

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Abstract: Thorough surveys of the terrestrial and freshwater mollusc fauna of the Seychelles islands have located all previously recorded species and a number of undescribed taxa. These are described here: *Moominia willii* (Pomatiopsidae), *Dupontia levensonia* (Helicariiondiae), *Stylodonta unidentata sebertae*, *S. u. praslina* and *S. u. parva* (Acavidae), *Pachnodus ladiguensis* and *P. curiosus* (Cerastidae). *Moominia willii* is the first Pomatiopsidae from the western Indian Ocean region and is suggested to represent a Gondwana relict. The species is recorded from the axils of *Pandanus hornei* trees in mist forest. The two *Pachnodus* species are extinct and represented only by subfossil specimens.

Key words: *Dupontia*; *Moominia*; *Pachnodus*; Pomatiopsidae; *Stylodonta*

The terrestrial Mollusca of the Seychelles islands have been studied since 1838 (Dufó 1840) and are now the most well known group of invertebrates in the islands. The main focus of research has been on their taxonomy due to their interesting biogeographical affinities, showing a mixture of vicariant Gondwana origins, ancient and recent colonists (Gerlach & Bruggen 1999). Intensive field research by the author since 1986 has resulted in the collection of a large number of new taxa, this has been added to by the collections of the Indian Ocean Biodiversity Assessment 2000-2005. The recent collections have include a further four undescribed species and have prompted the revision of one variable species. The new taxa are described below. For each species IUCN Red List criteria are applied (IUCN 2001)

Abbreviations

AM	Australian Museum
UMZC	University Museum of Zoology, Cambridge
NPTS	Nature Protection Trust of Seychelles
ZMB	Zoological Museum, Berlin

PROSOBRANCHIA

Hydrobiidae

The hydrobioid Pomatiopsidae (Mollusca; Gastropoda) are widespread in tropical and temperate regions. Of the three subfamilies recorded, the Pomatiopsinae is the only one to include terrestrial and amphibious genera. Within the Pomatiopsinae the majority of genera are aquatic (*Cecina*, *Coxiella*, *Floridiscrobis*, *Fukuia*, *Idiopyrgus*, *Oncomyelania* and *Pomatiopsis*) with a single terrestrial genus, the arboreal *Blanfordia* of Japan.

In August 2000 5 specimens of an arboreal operculate snail were collected on Silhouette island. The species was immediately recognisable as distinct from any other Seychelles prosobranch genus by a number of external characters: a horny operculum (unlike *Tropidophora* and *Cyathopoma* - Pomatisidae), an undivided sole (unlike *Tropidophora* - Pomatisidae), the absence of accessory radular plates and a dextro-laterally placed penis

(unlike *Syncera* - Assimineidae). There are records of the superficially similar *Leptopoma* (Cyclophoridae), however this has 2 narrow, similar marginals. The two supposedly Seychelles *Leptopoma* (*L. seychellarum* Pfeiffer, 1874 and *L. seychellense*) have been suggested to be juveniles of *Tropidophora pulchra* (Martens 1898; Gerlach 1986) and this interpretation is probably correct. The specimens described below are the first pomatiopsid snails to be found in Seychelles and represent a new monotypic genus.

The only other hydrobioids to be recorded in the region have been Assiminaeidae (*Assimineia* and *Syncera* throughout the region, and *Omphalotropis* in the Mascarenes. The Assiminaeidae have multicusped lateral teeth and accessory radular plates and the penial opening is on the centre of the head, rather than the right side. The immature *Omphalotropis globosa* reported from Seychelles by Martens (1898) is described as having a strong keel around the umbilicus, a characteristic colour with “white spots and an interrupted serrated band on a dark chocolate-coloured base”, this does not resemble the species described below and its true identity remains unknown.

Genus *Moominia* gen. nov.

Type species: *Moominia willii* sp. nov.

Diagnosis: Arboreal pomatiopsid with conical shell. Body distinguished by a combination of long tentacles, well developed suprapedal fold and sessile eyes. Penis terminally dilated with elongate glandular papilla.

Etymology: *Moominia* in reference to the close resemblance of the body to the Moomins created in the books by Tove Jansson.

Distribution: Known only from Silhouette island, Seychelles.

Comparison with other pomatiopsinine genera: *Moominia* differs from the arboreal *Blanfordia* of Japan which has stubby tentacles, in this genus eyes may be either sessile or tuberculate. Long tentacles are also found in *Pomatiopsis* (North America), *Coxiella* (Australia), *Floridiscrobis* (North America), *Idiopyrgus* (South America) and *Oncomyelania* (South and east Africa). Shell sculpture is indistinct on all genera except *Idiopyrgus* and *Oncomyelania*, both of which have a sculpture of pronounced radial ribs. The lack of gill filaments is shared with *Cecina* and the lack of papillae on the verge with *Cecina*, *Coxiella*, *Blanfordia*, *Fukina*, *Pomatiopsis* and *Tomichia*. *Moominia* differs from all other pomatiopsids in having a terminally expanded penis with a distinct glandular papilla. This resembles the penial structure of the Triculinae although it is distinct from this subfamily in moving by muscular action, possessing a suprapedal fold and in radular structure. The apparently triculinine penial structure may suggest that *Moominia* is a basal pomatiopsine, retaining some affinities to the triculines.

***Moominia willii* sp. nov. (Fig. 1)**

Type material: Holotype: UMZC 2000.33; Gratte Fesse, Silhouette island, Seychelles, 350m a.s.l. 21/7/2000, coll. J. Gerlach & J. Willi. Paratypes: NPTS 2000.20-3; Gratte Fesse, Silhouette island, Seychelles, 350m a.s.l. 21/7/2000, J. Gerlach & J. Willi.

Etymology: Named after Johanna Willi, collector of the first specimen

Description: Shell: Conical with 5 whorls. Apex blunt, protoconch of 1.5 smooth whorls. Raised ridge along keel and around columella, sculpture of semi-regular growth lines, separated by 2 fine regular radial ridges (10mm⁻¹). Columella angled at base; umbilicus open.

Operculum horny, transparent. Shell dark horn colour, translucent.

Body: Eyes sessile, tentacles long; suprapedal fold well developed; sole undivided. Body colour grey, a white glandular patch present behind each eye and on mantle posterior to border on left side. Mantle and mantle border grey, black band behind border.

Radula: Radula formula 1+2+C+2+1. Central tooth tricuspid, with 4 basal denticles. Marginals with 5 cusps, lateral with 10 comb-like cusps.

Reproductive anatomy: Penis elongate, penial sheath thick. Terminally expanded with elongate papilla. Papilla with distinct raised glands. 2 separate penial retractor muscles attached; the postero-lateral muscle joining the left optic retractor and the antero-medial muscle joining the right optic retractor.

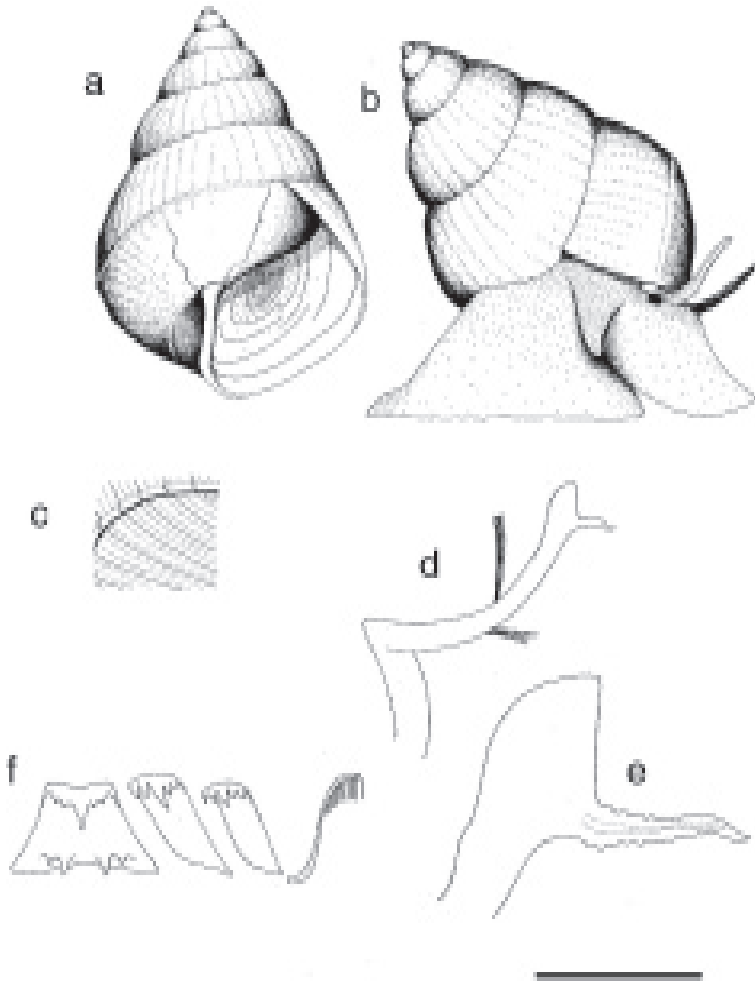


Figure 1. *Moominia willii* a-b. Holotype shell, scale bar: 1.2mm; c. Detail of shell sculpture of middle of body whorl, scale bar 0.3mm; d. Penis, scale bar 0.25mm; e. Detail of tip of penis, scale bar 0.05mm; f. Radula teeth C, 1, 2, 3, scale bar 0.03mm.

Table 1. *Moominia willii* measurements (in mm)

		Diameter	Height	Whorls	N
Holotype	(UMZ 2000.33)	4.8		3.4	5 -
Paratypes	(NPTS 2000.20)	4.5		3.4	5 -
	(NPTS 2000.21)	4.8		3.5	5 -
	(NPTS 2000.22)	2.5		1.6	3 -
	(NPTS 2000.23)	2.8		2.0	3 -
Range		2.5-4.8		1.6-3.5	3-5 5
Mean (s.d.)		3.9 (1.13)		2.8 (0.9)	4.2 (1.1)

Distribution: Gratte Fesse, Silhouette island, 350m a.s.l.. Collected from axils of *Pandanus hornei* trees. Searches of axils of *P. seychellarum* in similar habitats elsewhere on Silhouette have failed to locate the species. Habitat destruction on other Seychelles islands has eliminated most high-altitude populations of *P. hornei* (Gerlach 1997), it is possible that relict populations of arboreal pomatiopsids may be present on Mahé and Praslin islands and the family may have been more widely distributed in Seychelles in the past.

PULMONATA

Helicarionidae

Dupontia Godwin-Austen, 1908

The genus *Dupontia* was formed to include small discoidal Ereptinae (Helicarionidae), previously included in *Microcystis*. *Dupontia* was defined by Godwin-Austen (1908) as having a long body with small mantle lobes, but no shell lobes, a tail horn is present over a well developed mucus gland and the foot is divided. The shell is discoidal, with a low spire. The sculpture is reduced and the shell surface generally smooth. The radula has reduced cusps, bicuspid laterals. The Mascarene helicarionoid genera include *Calwellia*, *Ctenoglypta*, *Ctenophila*, *Dupontia*, *Erepta*, *Harmogenania*, *Lousisia*, *Pachystyla*, *Pilula*, *Plegma*, *Pseudocaelatura*, *Colparion*, *Macrochlamys* and *Thapsia*. *Dupontia* has 7 species in the Mascarenes: *D. laevis*, *D. maillardi*, *D. nitella*, *D. perlucida*, *D. poweri*, *D. virginia* and a newly described subfossil taxon (O. Griffiths, pers. comm.). All the extant species have been recorded on Mauritius, with *D. maillardi*, *D. nitella* and *D. virginia* also being present on Reunion. The subfossil taxon has been found on Rodrigues (O. Griffiths pers. comm.). To date no *Dupontia* species have been described outside of the Mascarenes although an unidentified species exists on Aldabra (Gerlach & Griffiths 2002).

In 1877 *D. virginia* was reported from Seychelles (Lienard, 1877; as '*Microcystis virginia*') but without a precise locality. The source of this record is not known and no specimens have been located, this record has therefore been considered to be an error (Gerlach 1986). In 2000 a *Dupontia* was collected on Silhouette island. Although the specimen has only 4 whorls and is probably not fully grown it is large enough to have developed distinctive sculpture and dissection revealed the presence of developed genitalia. Comparison with the Mascarene *Dupontia* show that the Seychelles taxon represents a distinct, undescribed species.

Dupontia levensonia sp. nov. (Fig. 2)

Type material: Holotype UMZC 2000.34, in axil of *Dracaena reflexa* plant, Mon Plaisir, Silhouette; mist forest 550m above sea level. 4/8/2000. J. Willi.

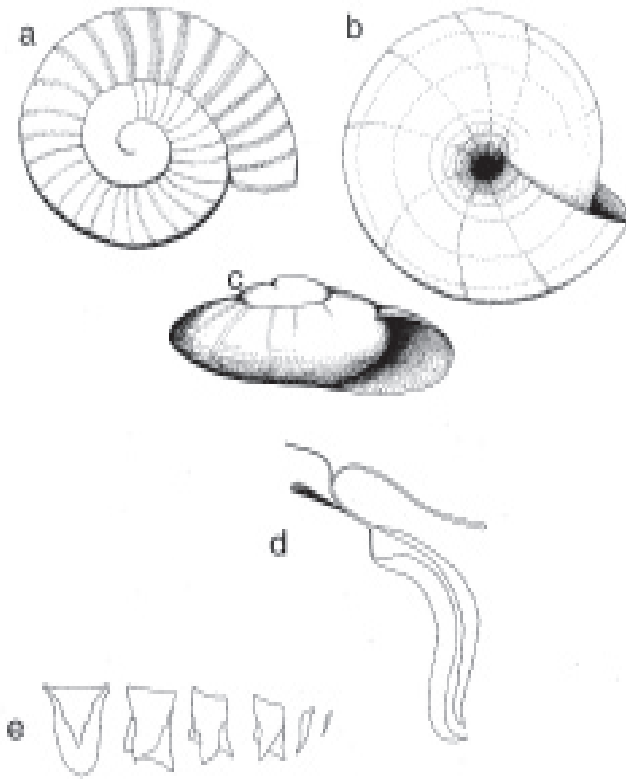


Fig. 2 *Dupontia levensonia* **a-c**. Holotype shell, scale bar: 0.5mm; **d**. Penis, scale bar 0.2mm; **e**. Radula teeth C, 1, 9, 10, 15, 21, scale bar 0.01mm.

Etymology: *levensonia* after Robert Levenson, supporter of conservation and research work on Silhouette and the Indian Ocean Biodiversity Assessment 2000-2005.

Description: Shell: The shell is discoidal, with a low spire. 2.5 whorls, with one smooth nuclear whorl. Sculpture of regular radial ridges, fine, regular spiral striae are visible at the edges of the ridges. Radial ridges reduced on underside but spiral striae are distinct and regular. The umbilicus is open but narrow (8% of shell diameter). Mouth broadly lunate. Horn coloured, glossy.

Body: The body has a caudal horn overhanging the caudal mucous gland. There is a distinct suprapedal groove. The body is dark grey.

Radula: Formula=31+9+C+9+31. Small lateral cusps are present on the marginal teeth. The laterals are unicuspid.

Reproductive anatomy: The penis is thin and elongate with a loosely attached penial sheath. The accessory organ is present as a swelling near the distal end of the penis, covered by the penial sheath. Epiphallus and flagellum are thin; penial retractor muscle terminal.

Table 2. *Dupontia levensonia* measurements (in mm)

	<u>Diameter</u>		<u>Height</u>	<u>Whorls</u>
UMZC 2000.34	1.0	0.6	2.5	

Distribution: Known only from the holotype from Mon Plaisir, Silhouette.

Notes: Conchologically the new taxon resembles *D. poweri* and *D. virginica* in the presence of spiral striae, although these are only visible at the sutures and not on the underside in *D. virginica*. Shell colour in *D. poweri* is greenish and reddish in *D. virginica*, unlike the horn colour of *D. levensonia*. Spiral striae have not been described in any other *Dupontia*.

Body colour is variable in the genus, with several brightly coloured species (yellow in *D. perlucida* and *D. nitella*). The black body found in *D. levensonia* is also recorded in *D. poweri* and *D. virginica*. Few of the previously described *Dupontia* species are known anatomically. In comparison to the new taxon *D. perlucida* has a longer penial accessory organ and epiphallus, and a radula formula of 39+9+C+9+39 (39+1+8+C+8+1+39 according to Godwin-Austen, 1908). In *D. laevis* there is no distinct penial accessory organ and the radula formula is 29+9+C+9+29 (26+4+8+C+8+4+26 according to Godwin-Austen 1908).

The anatomy of *Dupontia* species is too poorly known to allow discussion of the relationships between the species. *D. levensonia* represents a major range expansion for the genus and with the unidentified Aldabran *Dupontia* this suggests that the genus may be more widely distributed in the western Indian Ocean and more diverse than has previously been recognised. The small size of many of the species and the presence of taxa such as *D. levensonia* in under-studied micro-habitats such as palm, *Pandanus* and *Dracaena* axils may contribute to their having been overlooked on many islands.

Acavidae

The Acavidae are an example of Gondawanian distribution, being represented in South America, Africa, India, Sri Lanka, Australia and the Seychelles islands. These are all remnants of Gondwanaland and the current distribution is a result of continental drift. In Seychelles the family is represented by two species of the endemic genus *Stylodonta*, they are present on the granitic islands of Mahé, St. Anne, Silhouette, Praslin, Curieuse, Felicite (Nevill 1869 but not located subsequently) and La Digue. Considerable variation is found in shell morphology and several varieties have been reported in one species. New material allows the limits of subspecific variation to be determined.

Stylodonta unidentata (Holten, 1802) Fig. 4

<i>Helix unidentata</i>	Chemnitz 1795: 273; Holten 1802; Ferussac 1821: 104; Dufo 1840: 199; Pfeiffer 1841: 303; Reeve 1849: 156; Martens 1880: 256; Schacko in Möbius <i>et al.</i> 1880: 342; Pilsbry 1890: 85
<i>Helix (Stylodonta) unidentata</i>	Adams & Adams 1858; Nevill 1870: 63, 1878: 81
<i>Helix (Stylodon) unidentata</i>	Beck 1837
<i>Helix militaris</i>	Pfeiffer 1855: 111
<i>Helix (Stylodon) unidentata</i> var. <i>globata</i>	Martens & Wiegmann 1898: 19

<i>Stylodonta unidentata</i>	Sykes 1909: 62; Germain 1934: 123; Lionnet 1984: 241; Gerlach 1986:18
<i>Stylodonta Studeri</i> (partim)	Germain 1934: 123
<i>Stylodonta Studeri</i> var. <i>globata</i> , <i>militaris</i>	Germain 1934: 123
<i>Stylodon studeriana</i> (partim)	Edlinger 1988: 395

This species was first named by Chemnitz (1795) but this work was not consistently binomial and the name was first made available by Holten (1802). There is considerable geographical variation in shell proportions, radula formula and penis size. The anatomical variations could be regarded as being of subspecific level. The differences in measurements are all statistically significant at the $P < 0.0002$ level for height and diameter, although the proportions are not significantly different. Logarithmic regressions of height and diameter are significantly different for each population (Fig. 3, Table 4). These differences are not due to local ecophenotypic effects as is shown by captive breeding and rearing of the three Mahé forms under identical conditions; this still results in the characteristic shell morphology of each form.

Distribution: Mahé, St. Anne, Conception, Silhouette, Praslin, Curieuse, La Digue and Felicite. The records from Fregate (Germain 1934; Barnacle 1962; Lionnet 1984; Gerlach 1986) are in error for Felicite due to a transposition in Germain (1934). The specimens labeled 'Fregate' in the Barnacle collection in the BMNH are of unknown origin, they are exceptionally large and most closely resemble specimens from south Mahé.

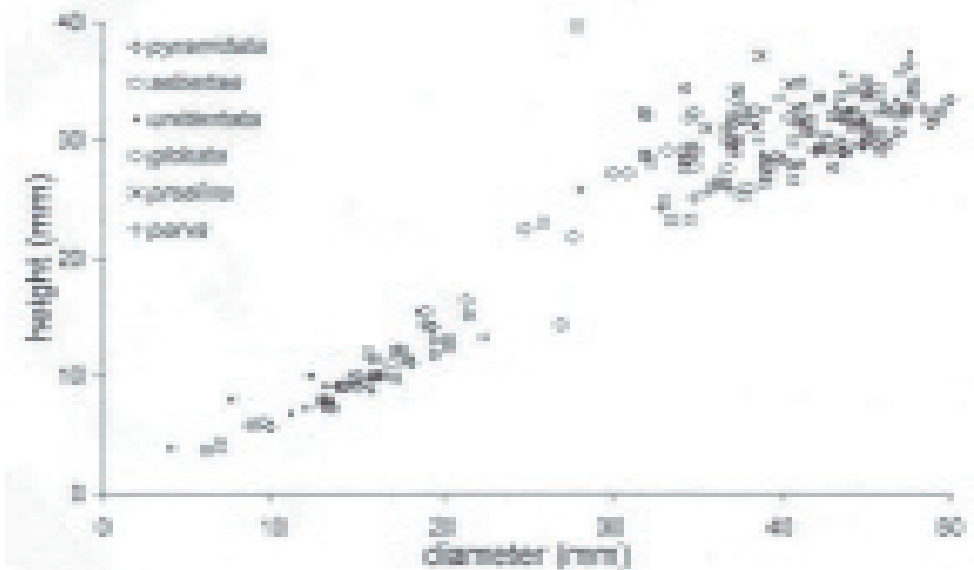


Fig. 3 Growth of *Stylodonta unidentata*

Table 3. *Stylodonta unidentata* measurements (in mm)

	Height	Diameter	H/D	N
South Mahé (La Reserve)	27.9-(31.35±2.21)-36.4	34.4-(44.58±3.18)-49.4	0.64-(0.71±0.06)-1.00	74
Central Mahé (Mt. Sebert)	23.2-(29.40±2.76)-34.4	31.9-(38.66±3.82)-44.6	0.67-(0.77±0.09)-1.02	33
North Mahé (Bernica)	28.1-(30.60±2.33)-33.6	37.5-(40.37±2.25)-43.8	0.68-(0.76±0.07)-0.84	25
St. Anne	28.8-(32.23±1.40)-37.4	38.7-(43.01±2.52)-47.5	0.71-(0.74±0.03)-0.78	27
Conception	31.8-34.4	41.2-49.1	0.70-0.77	2
Silhouette	27.2-(30.94±3.46)-39.7	25.0-(36.01±4.08)-40.5	0.72-(0.87±0.13)-1.42	123
Praslin	28.2-(33.41±2.68)-37.2	32.0-(39.80±2.83)-42.3	0.80-(0.84±0.05)-0.96	13
Curieuse	27.5	36.5	0.75	1
La Digue	24.3-(26.10±2.33)-31.1	33.0-(35.63±1.54)-37.5	0.70-(0.74±0.05)-0.84	8
'Fregate' (Barnacle colln.)	35-37	55-56	0.64-0.66	2

Table 4. Regression equations for *Stylodonta unidentata* populations, in all $P < 0.001$.

Island	Population	Regression	R ²
Mahé	Bernica	$\log(D+1) = 0.9871(\log[H+1]) - 0.1167$	0.945
Mahé	Mt. Sebert	$\log(D+1) = 1.0491(\log[H+1]) - 0.2019$	0.904
Mahé	La Reserve	$\log(D+1) = 1.0671(\log[H+1]) - 0.2614$	0.976
St. Anne		$\log(D+1) = 0.6587(\log[H+1]) + 0.4425$	0.489
Silhouette		$\log(D+1) = 1.1756(\log[H+1]) - 0.3458$	0.933
Praslin		$\log(D+1) = 0.7858(\log[H+1]) + 0.2783$	0.557
La Digue		$\log(D+1) = 1.3758(\log[H+1]) - 0.7146$	0.496

Stylodonta u. unidentata (Holten, 1802)

Type material: Neither Chemnitz (1795) nor Holten (1802) designated a holotype. Chemnitz's specimen cannot be located and a neotype is hereby designated: UMZC 2003.57.5 (Morne Blanc, Mahé; 24.vii.1996, J. Gerlach). This has the proportions of the Chemnitz (1795) figure and only the St. Anne - north Mahe populaiton would have been accessible in the 1790s (Chemnitz gave the erroneous locality 'Cayenne').

Description: Shell: Globular (H/D approximately 0.76) shell with 5-6 whorls, apex blunt, umbilicus covered. Slightly keeled in most (64%) specimens. Surface with fine regular spiral striae on first 2 whorls, others with irregular growth lines only. Mouth edge, thickened and reflected, violet colored, the outer edge white; a strong denticle on the columella. Shell colour yellow brown to dark brown (dark in 80% of specimens).

Body: Brown, shade varying with shell shade.

Radula: 10x4mm, 155 rows, 42+21+1+21+42; central tooth symmetrical, monocuspid, laterals bicuspid; marginals reduced.

Reproductive anatomy: Penis long (18mm), simple, retractor muscle sub-terminal. Thick penis sheath present. Spermatheca oval (1/4 penis length), duct long (slightly longer than penis), base of spermoviduct inflated into a brood chamber.

Distribution: North Mahé, St. Anne (extinct) and Conception. Widespread on Mahé but scarce since the introduction of the tenrec *Tenrec ecaudatus* in the 1890s; extinct on St. Anne following habitat destruction in the late 1700s. Vulnerable (D2 – geographically restricted).

Stylodonta unidentata sebertae ssp. nov.

Type material: Holotype UMZC 2003.57.2, 5 paratypes NPTS M1997.208a (Mt. Sebert, Mahé, 5.i.1989. coll. J. Gerlach).

Etymology: Named after the type locality, Mt. Sebert.

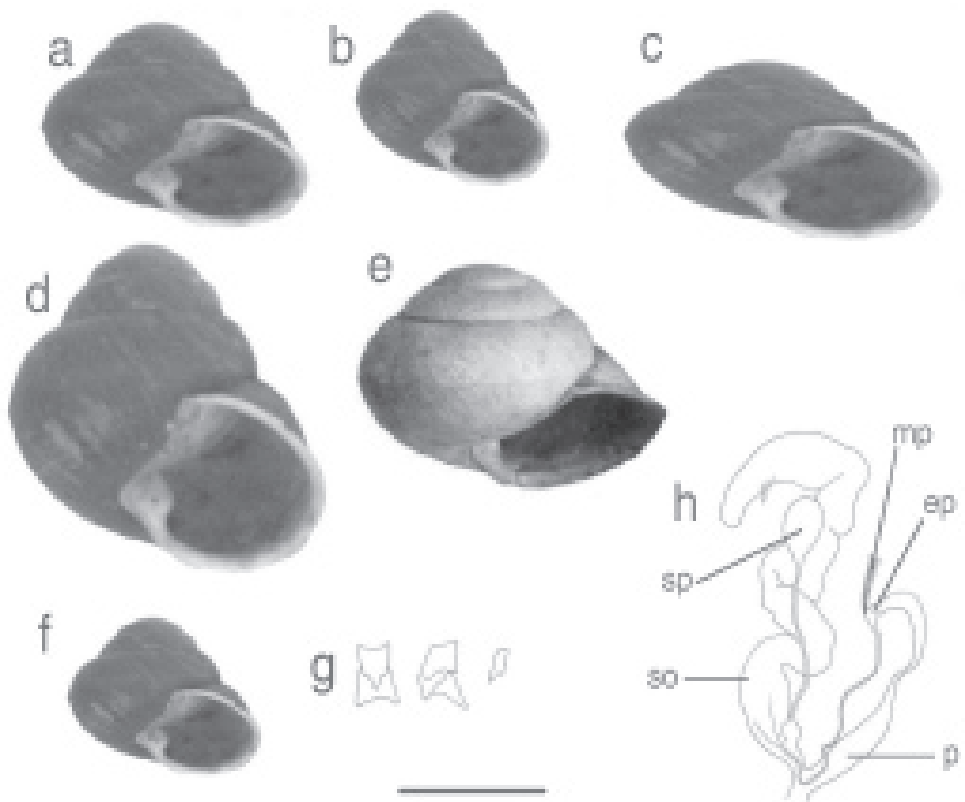


Fig. 4 *S. unidentata* subspecies. a- *S. u. unidentata*; b - *S. u. sebertae*; c - *S. u. pyramidata*; d - *S. u. globata*; e - *S. u. praslina*; f - *S. u. parva*; g - radula teeth (c, 1, 20); h - *S. u. unidentata* reproductive anatomy (ep - epiphallus, mp - penial retractor muscle, p - penis, so - spermoviduct, sp - spermatheca). Scale a-f=10mm, g=0.2mm, h=15mm

Description: Shell: A relatively small, globular form (H/D=0.77). Rarely keeled. Shell colour dark brown. Otherwise as type subspecies.

Anatomy: As type form except radula with 18 marginals

Distribution: West Mahé: Mt. Sebert, Cascade and Capucins. This subspecies is locally abundant, although it has declined at Cascade in recent years due to habitat loss and development. It was locally abundant in a small area at Mt. Sebert until the late 1990s but is now scarce, apparently as a result of habitat degradation. Vulnerable (D2 – geographically restricted).

***Stylodonta unidentata pyramidata* (Pfeiffer, 1841)**

Type material: Holotype not located; neotype designated UMZC 2003.57.6 (La Reserve, Mahé, 23.iii.1993. . J. Gerlach).

Etymology: Named after the type locality, La Reserve.

Description: Shell: A broad form (H/D=0.71), often slightly keeled (94% on Mahé).

Colour yellow brown to dark brown (dark in 55% of Mahé specimens). Otherwise as type subspecies.

Anatomy: Penis relatively long, with epiphallus present and more inflated than type form, radula as type form.

Distribution: South Mahé: a highly abundant subspecies at La Reserve. Vulnerable (D2 – geographically restricted).

Notes. – The type of *Helix unidentata* var. *pyramidata* is lost but the measurements fit those of the south Mahé population.

Stylodonta unidentata globata (Martens, 1880)

Type material: Holotype ZMB 103.089; catalogued as Silhouette, 1895, A. Brauer (M. Glaubrecht pers. comm.). Named by Martens in 1880 in a figure caption but not described and no holotype designated until 1898□6.

Description: Shell. – Proportionately high (H/D=0.87); not keeled; shell almost always dark brown. Otherwise as type subspecies.

Anatomy: As type form except radula with reduced lateral teeth: 30+21+1+21+30.

Distribution: Silhouette. Vulnerable (D2 – geographically restricted).

Notes: A highly abundant subspecies all over Silhouette. Nevill (1878) reported the same variety occurring on Silhouette, Felicite and Curieuse, this would seem unlikely on biogeographical grounds (see the following taxon).

Stylodonta unidentata praslina ssp. nov.

Type material: Holotype UMZC 2003.57.3; Paratype NPTS M2003.1 all Praslin National Park, Praslin, 18.iii.2002. J. Gerlach.

Etymology: Named after the island of origin, Praslin.

Description: Shell: High and proportionately narrow (H/D=0.84); not keeled. Otherwise as type subspecies.

Anatomy: As type form but penis not constricted, epiphallus not inflated. Additional lateral teeth: radula formula 52+21+1+21+52

Distribution: Praslin and Curieuse. Now extinct on Curieuse due to fires in the 1800s and extremely rare and localized on Praslin. Abundant subfossils in the north of Praslin indicate a wider historical distribution. Prior to the loss of most of the island's forests in fires in the 1800s and predation by tenrecs (*Tenrec ecaudatus*). Vulnerable (D1 – population approximately 700 adults).

Stylodonta unidentata parva ssp. nov.

Type material: Holotype UMZC 2003.57.4; paratype NPTS M2003.2, all Belle Vue, La Digue, Seychelles. vii.1990. O. Griffiths.

Etymology: *parva*, Latin for small.

Description: Shell: A relatively small shell with H/D=0.74; not keeled; always dark brown. Otherwise as type subspecies.

Anatomy: Unknown

Distribution: La Digue. Scarce, found only in the highest forest areas, historically probably more common and widespread as indicated by subfossils. Vulnerable (D2 – geographically restricted).

Cerastidae

The granitic Seychelles Cerastidae (until recently often placed in Enidae) comprise one endemic genus: *Pachnodus*. Two undescribed subfossil taxa have been collected.

Pachnodus (Nesiocerastus) ladiguensis sp. nov. (Fig. 5a)

Pachnodus sp.

Griffiths & Gerlach 1991; 7

Pachnodus 'La Digue'

Gerlach 1997: 45, 1999: 252

Type material: Holotype (AMS C426122), 1 paratype (AMS C426123) - in sandy trenches, just N of Flycatcher Reserve, Anse La Reunion, La Digue; iv.2001, O.L. Griffiths; 1 paratype (NPTS M1999.3) – iii.1992; J. Gerlach. Additional non-type sepecimens in NTS and O. Griffiths collections, same locality as types.

Etymology: Named after the island of origin, La Digue.

Description: Shell: Shell conical with 6-6.25 whorls and 1 nuclear whorl, strong; surface shiny; irregular radial ridges, no spiral striae detectable. Suture with a slight ridge. Apex blunt; umbilicus open (1-1.8mm wide), partially covered by the columella; mouth edge slightly reflexed but not forming a true lip. Coloration originally mahogany brown with a dark spiral band on the middle of the body whorl and a pink tint to the columella. Most specimens are bleached and it is not known if the spiral band and the pink columella were normal characters.

Body and anatomy: Unknown.

Distribution: La Digue, Seychelles; only sub-fossil material from the plateau at La Reunion.

Notes: This species is most similar to *P. praslinus* and *P. fregatensis* but is distinguished by the presence of a slight sutural ridge. *P. praslinus* has a broader aperture.

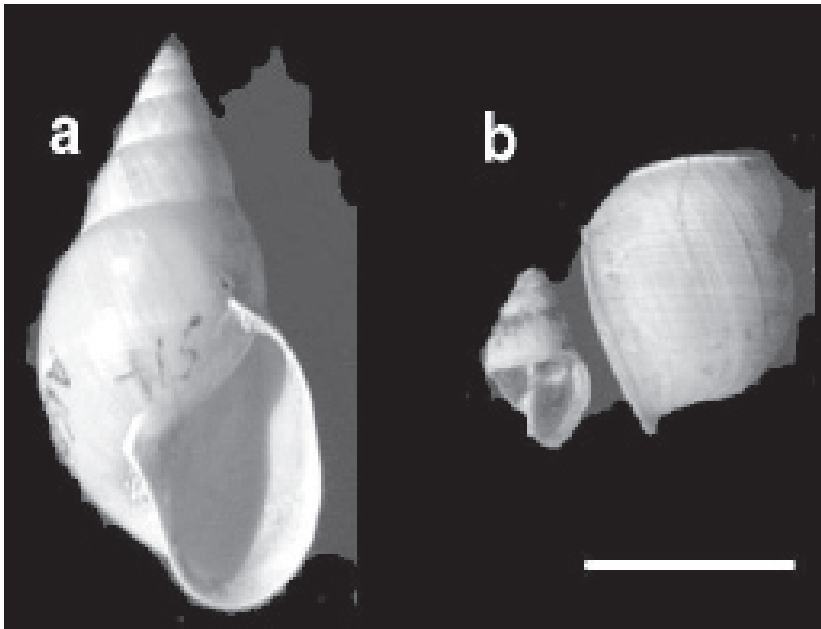


Fig. 5 a). *Pachnodus ladiguensis*; b). *Pachnodus curiosus*. Scale bar 15mm

The material consists of subfossil shells and fragments. No traces of recent shells or live specimens have been found on La Digue despite repeated searching, the species is therefore believed to be extinct. The subfossils were collected from spoil heaps and from ditches dug on the plateau. They were found in association with *Subulina octona*, *Paropeas achatinaceum*, *Caeciloides mauritiana*, *Stylodonta unidentata* and *Tropidophora pulchra*. Specimens found *in situ* were 15cm below the surface. The widespread alien species *Achatina fulica* was restricted to the top 10cm of soil. This species was introduced to Seychelles in the early 1800s (Dufou 1840), indicating that *P. ladiguensis* became extinct shortly after the island was colonized in the late 18th to early 19th century. The abundance of shells of species now rare on La Digue (*T. pulchra* and *S. unidentata*) in these deposits suggests that these species have declined due to human disturbance, probably forest clearance.

***Pachnodus (Nesiocerastus) curiosus* sp. nov.** (Fig. 5b)

Type material: Holotype (UMZC 2003.57.1), 3 paratypes (NPTSxxxxx), all fragmentary subfossils. Holotype from Baie Laraie, paratypes from Anse St. Joseph, all Curieuse 18.x.2002 (coll. J. Gerlach).

Etymology: Named after the island of origin, Curieuse.

Description: Shell: Shell conical; number of whorls estimated at 6; 2 nuclear whorls; thin and fragile; surface shiny; irregular radial ridges, well developed spiral striae. Suture with a slight ridge. Apex pointed; umbilicus probably open; mouth edge slightly reflexed but not forming a true lip. Coloration not known (all specimens are bleached).

Body and anatomy: - Unknown.

Distribution: Curieuse, Seychelles. Known only from sub-fossil material.

Notes: The limited available material of this species is most similar to *P. ladiguensis* and *P. fregatensis* but is distinguished by traces of a shiny shell surface in one specimen and in the size of the protoconch. These features resemble *P. oxoniensis*, *P. ornatus* and *P. kantilali* but differ from these species in the development of the suture and the mouth edge and the presence of a slight sutural ridge. *P. praslinus* has a broader aperture. On the basis of these comparisons *P. curiosus* appears to belong to the plesiomorphic terrestrial *Pachnodus* species (*P. fregatensis* and *P. ladiguensis* – Gerlach 1999).

The material consists of subfossil shell fragments. No traces of recent shells or live specimens have been found on Curieuse despite repeated searching, the species is therefore believed to be extinct. The subfossils were collected from plateau soil in association with *Stylodonta unidentata*, *S. studeriana* and *Tropidophora pulchra*. These have all been extinct on Curieuse since the early 1800s, probably as a result of extensive forest fires.

Table 6. *Pachnodus ladiguensis* measurements (in mm) (n = 6)

	Height	Diameter	H/D	Whorls
Holotype (AMS C426122)	26.8	14.6	1.84	6.25
Paratype (AMS C426123)	26.0	14.8	1.76	6
Paratype (NPTS M1999.3)	23.5	11.8	1.99	6
Range, mean and s.d.	23.5-(26.10±1.53)-28.0	11.8-(13.93±1.11)-14.8	1.75-(1.88±0.11)-2.00	6-6.25

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