

Molluscs of the Dutch Caribbean Islands

The journal of the Netherlands Malacological Society, *Vita Malacologica*, dedicated its December 2017 edition to the malacofauna of the Dutch Caribbean¹. The three articles presented in the edition report on the findings of several research projects that recently investigated the marine and terrestrial mollusc fauna of Saba, St. Eustatius and the ABC Islands (Aruba, Bonaire, and Curaçao). What transpires is that the mollusc fauna of these islands is much richer than previously thought, with many rare and endemic species. The biodiversity of the Dutch Caribbean Islands is already recognized as rich and unique, but the findings on the islands' malacofauna indicate that there is still much to discover.

A rich mollusc fauna

While previous assessments have been made of the mollusc fauna of the Dutch Caribbean, many of these took place decades ago and are incomplete. Thanks to the dedication of the authors who recently researched the malacofauna of Saba, St. Eustatius and the ABC Islands (Hovestadt and van Leeuwen, 2017; Hewitt, 2017; Hewitt and van Leeuwen, 2017), we now have a much better grasp of just how rich this fauna is.

ABC Islands

Detailed studies of the ABC Island's terrestrial malacofauna were carried out in the first half of the 20th century (Baker, 1924; Wagenaar Hummelinck, 1940). Since then, attempts have been made to create an updated checklist of

the islands' terrestrial molluscs, but these were incomplete and at times unclear (Hovestadt & De Boer, 1982 and Hovestadt, 1987). To rectify this, Hovestadt and van Leeuwen carried out a complete overview of the terrestrial malacofauna of Aruba, Bonaire, and Curaçao². They compiled information for the study through 1) fieldwork they carried out on the islands between 1979 and 2016, 2) material collected by others and identified by Hovestadt, and 3) knowledge and data derived from previous publications (Hovestadt and van Leeuwen, 2017). They found that the ABC islands have "a very rich and diverse terrestrial malacofauna both in numbers and in taxa" with a total of 65 taxa (species and subspecies) recorded (Hovestadt and van Leeuwen, 2017). Curaçao was the most species-rich island, and Klein Curaçao the poorest. Klein Bonaire had the highest diversity of species per km².

Saba

Very little attention has been given to Saba's marine malacofauna in the past. In 2009, Rosenberg listed 17 taxa for the island, most of which were subtidal species (Hewitt, 2013). Hewitt compiled photographs and information from 2010-2012, adding 38 taxa to this list (26 gastropods, 4 bivalves, 4 chitons and 4 cephalopods), bringing the total of marine mollusc taxa for Saba to 55 (Hewitt, 2013). Hewitt subsequently obtained more information from Rüdiger Bieler and others, and added another 40 new taxa to the list. As of 2018, the total of recorded shallow-water, marine malacofauna for Saba and the Saba Bank is 95³ (Hewitt, 2017).

St. Eustatius

Prior to 2015, the marine malacofauna of St. Eustatius had seldom been explored (Coomans, 1958; Kaas, 1972; Hewitt, 2010b). In 2015, Hewitt published the most comprehensive list to date of marine molluscs which had been observed by her and others from 2000 to 2011, for a total of 183 taxa (Hewitt, 2015). Also in 2015, the St. Eustatius Marine Biodiversity Expedition, organized by Naturalis Biodiversity Center and ANEMOON Foundation, took place. This three-week expedition surveyed the island's shallow (<30m) marine fauna and flora, and presented an unparalleled opportunity to record both the underwater and shoreline molluscs of St. Eustatius.

A total of 366 mollusc species in six classes were recorded during the course of the St. Eustatius Marine Biodiversity Expedition – 300 at dive sites and 177 at coastal sites, with 113 species being found at both (Hewitt and van Leeuwen, 2017). The marine mollusc faunal list for St. Eustatius now stands at 395 species. The dive site with the greatest recorded species diversity (129 species) was STENAPA Reef, due to the exceptionally rich sediment sample collected there. The most widespread species found at dive sites were the flamingo tongue (*Cyphoma gibbosum* f. *gibbosum*), and queen conch (*Lobatus gigas*) (Hewitt and van Leeuwen, 2017). The coastal site with the greatest species diversity (99 species) was Crooks Castle. Some of the most common intertidal species were the West Indian top snail (*Cittarium pica*), green-based tegula (*Tegula excavata*), checkered

nerite (*Nerita tessellata*) and the marbled chiton (*Chiton marmoratus*) (Hewitt and van Leeuwen, 2017). Dive stations yielded richer and more varied results than the coastal stations (Hewitt and van Leeuwen, 2017). The research team also collected 130 individual molluscs from 53 species for DNA sampling. This was a contribution to Naturalis Biodiversity Center's Dutch Barcoding Project, and it also helped settle some questions of identity (Hewitt and van Leeuwen, 2017).



Cyphoma gibbosum, photo by: © Marion Haarsma



Lobatus gigas, photo by: © Marion Haarsma

¹ Molluscs (phylum Mollusca) are invertebrate animals that include among others snails, slugs, clams, squids and octopi.

² This includes the satellite islands of Klein Bonaire and Klein Curaçao.

³ Of the 95 species, 93 are for Saba alone.

New, rare, invasive and endemic species

All three studies yielded some very exciting discoveries, including new species for the islands and some very rare species. The ABC Islands are also a treasure-trove of endemic land snail species.

ABC Islands

Although no new species were found, two very rare species were observed on Sint Christoffelberg in Curaçao. The land snail *Guppya molengraaffi* had been observed only once before (Baker, 1924) however, nine specimens were found alive on Sint Christoffelberg. The land snail *Helicina dysoni* was recorded for the first time ever in its natural habitat on the same mountain. The uniqueness and genetic variation of the ABC Islands' malacofauna is highlighted by the large number of endemic species. In fact, 35 (20 species and 15 subspecies) of the island's 65 taxa are endemic (Hovestadt and van Leeuwen, 2017). Several endemic genera show significant variations related to their geographical distribution pattern.

All endemic species previously described by Baker (1924b) and by Hummelinck (1940c) were found again by Hovestadt and van Leeuwen (2017), meaning that none have become extinct over the past century, despite a significant increase in local threats (Hovestadt and van Leeuwen, 2017). Terrestrial molluscs typically inhabit limestone-rich areas, and this has helped spare them from habitat loss due to the construction of resorts. Hovestadt and van Leeuwen (2017) did, however, identify one area on Curaçao which is seriously threatened by extensive mining for the building industry: Tafelberg near Santa Barbara, which is an important habitat for a number of endemic land snails (*Tudora pilsbryi*, *Tudora rupis rupis*, *Tudora r. newportensis* and *Brachypodella sanctaebarae*) (Hovestadt and van Leeuwen, 2017). Aruba appears to have the greatest decline in terrestrial mollusc species, with several species not found again, of which three are rare or/and have a restricted range (*Gastrocopta octonaria*, *Gastrocopta curacoana*, *Thysannophora crinita*).

Found on the ABC Islands were seven land snail species which had not been included in previous overviews by Baker (1924b), Wagenaar Hummelinck (1940c), and Hovestadt (1987): *Helicina fasciata fasciata*, *Leptinaria lamellata*, *Polygyra cereolus*, *Oleacina solidula*, *Bulimulus guadalupensis*, *Zachrysia provisoria* and *Lissachatina fulica* (Hovestadt and van Leeuwen, 2017). It is likely that these land snail species are introduced, and while their range is still very small, two of the species have the potential to spread rapidly and harm the islands' garden plants and agricultural produce: *Zachrysia provisoria* and *Lissachatina fulica* (Hovestadt and van Leeuwen, 2017).

Saba

Hewitt added 40 previously unreported records to the list of marine molluscs for the island, almost doubling the total. Uncommon sea snails recorded were *Polygona infundibulum*, *Hemipolygona sp.* and *Coralliophila salebrosa* (Hewitt, 2017).

St. Eustatius

Hewitt and van Leeuwen (2017) reported 207 species of marine molluscs that were new for St. Eustatius, some of which were not previously known to inhabit the Eastern Caribbean region. The recently described bivalve *Parvilucina latens* (2016) is a new record for the island and also for the Eastern Caribbean Region. It had only ever been recorded in Guadeloupe, and is therefore a 200 km range extension to the north-northwest (Hewitt and van Leeuwen, 2017). Two other new records for the island and the Eastern Caribbean region represent much larger range extensions. The nudibranch *Melibe arianae* (2013) has only been recorded once, in Florida, USA, however, two live individuals were found at the dive site Twin Sisters, a range extension of over 2,000 km east-southeast. The invasive species *Doriprismatica sedna*, found at dive site Aquarium, is a new record for the Eastern Caribbean with a range extension of over 1,000 km to the east-southeast (Hewitt and van Leeuwen, 2017).



Doriprismatica sedna, photo by: © Marco Faasse



Parvilucina latens, photo by: © Sylvia van Leeuwen

Molluscs of the Dutch Caribbean Islands

New observations for St. Eustatius include the sea snails *Arene tricarinata* and *Fossarus ambiguus*, the scallop species *Antillipecten antillarum* and *Caribachlamys ornata*, and the scaphopods *Polyschides tetraschistus* and *Graptacme semistriolata* (Hewitt and van Leeuwen, 2017). Numerous uncommon species were recorded, including several species that had previously not been reported, or only very rarely reported from the Eastern Caribbean ecoregion: the marine bivalve species *Gari circe*, *Pleurolucina hendersoni*, *Cratis antillensis*, *Tucetona sericata* and *T. subtilis*, the sea slugs *Elysia ornata* and *Flabellina verta*, and the sea snails *Fissurella punctata*, *Lucapina philippiana*, *Synaptocochlea picta*, *Turritella exoleta*, and *Bivetopsia rugosa* (Hewitt and van Leeuwen, 2017).

Next steps

The inventory of the malacofauna of the Dutch Caribbean is now much more comprehensive thanks to research carried out these past few years. It is, however, by no means complete.

There is still much to investigate, for example, a complete overview of the marine molluscs of the ABC islands has never been made. Improved knowledge is critical to the conservation of the islands' mollusc species, and will help identify sites that must be protected. Also the terrestrial mollusc fauna of St. Eustatius is not very well known. During the Statia Marine Expedition, a new species was discovered on the Quill. It was described as new to science and named *Glyphyalus quillensis* (De Winter, Van Leeuwen and Hovestadt, 2016). A complete overview of the terrestrial molluscs of the island is still work in progress. An inventory of the land molluscs of Saba was published in 2005 (Van Leeuwen, Boeken & Hovestadt, 2015). The marine mollusc fauna of Saba requires a great deal more investigation.

The special issue of *Vita Malacologica* on the Dutch Caribbean molluscs is available via www.conchbooks.de. A report with the preliminary results of the Statia marine expedition 2015 is available at: <http://www.repository.naturalis.nl/record/616970>.

Molluscs of the Dutch Caribbean Islands



Pl. 1. Taxa from the Annulariidae family.
No. 5 from Aruba
No 6 and 7 from Curaçao
No. 8 from Bonaire
Size approx. 8.0 mm

Photos by: © A. Hovestadt



Pl. 2 Taxa from the Urocoptidae family.

Upper Row:
Specimens from Curaçao

Bottom Row
No. 16-19 specimens from Bonaire
No. 20-22 specimens from Aruba.

Size varies from 6.1 mm to 9.3 mm.

Photos by: © A. Hovestadt



Would you like to share a news item?
Please e-mail us: research@DCNAnature.org