

SHORT COMMUNICATION

FIRST DISCOVERY OF LIVING
CLATRIPOMA CONOIDEA (L. PFEIFFER, 1846)
(CAENOGASTROPODA: LITTORINIMORPHA:
POMATIIDAE) ON REUNION ISLAND

VICTOR CADET, NICOLAS HUET

Association pour la Recherche et la Conservation des Arthropodes et des Mollusques, Saint-Joseph, Reunion (e-mail: cadetvictorjd@gmail.com)

ABSTRACT: In this paper, we report the presence of living individuals of *Clatripoma conoidea* (L. Pfeiffer, 1846), Pomatiidae, for the first time on Reunion island (Mascarene archipelago). The species, previously known only from subfossils on the island, has been observed in two dry habitat relics. The discovery of live *C. conoidea* are exceptional and stress the need for urgent conservation action to protect native habitats and the species that depend on them.

KEY WORDS: conservation; extinction; Mascarene archipelago

The Mascarene archipelago in the South-West Indian Ocean is composed of three volcanic islands: Rodrigues (108 km²), Mauritius (1,865 km²), and Reunion (2,512 km²). The Mascarenes are home to approximately 165 native species of non-marine molluscs (not including aquatic and coastal species), over 90% of which are endemics (GRIFFITHS & FLORENS 2006). The archipelago hosts 13 species of native land snails belonging to the Pomatiidae family, one of the largest in body size terrestrial taxa in the three islands. Their conservation status has become a cause for significant concern. Of the 13 species, six are now extinct, all of which were endemic, and five are threatened. Some of these species had multi-island ranges and are extinct on some islands on which they previously occurred (GRIFFITHS & FLORENS 2006). Although this family could have had natural predators (HUME 2019), many species have not survived the arrival of alien predator species, and the destruction of their habitat since human settlement in the 17th century (GRIFFITHS & FLORENS 2006, CHEKE & HUME 2008). On Reunion, the three pomatiids, *Tropidophora carinata* (Born, 1780),



Fig. 1. *Clatripoma conoidea* observed on Reunion, Bras des Merles (800 m a.s.l.), on 9 December 2023. Scale bar 5 mm

T. fimbriata (Lamarck, 1822), and *Clatripoma conoidea* (L. Pfeiffer, 1846) (formerly *Cyclotopsis conoidea*, see NEUBERT (2009)), related to lowland native forests, especially in the leeward coast, were considered extinct, and only *T. fimbriata* has been found alive, for the last time in the 18th century (DESHAYES 1863, GRIFFITHS & FLORENS 2006). Live populations of the latter two still occur in Mauritius (GRIFFITHS & FLORENS 2006), while the last record of the former species alive dates back to the late 19th century on Mauritius (NEVILL 1881).

During a field survey on 28 November 2023, in Bras de Sainte-Suzanne, Reunion (1,000 m a.s.l.), a remote remnant of a dry habitat (annual rainfall 1,000–1,500 mm; RIVALS 1952, CADET 1977)

around a river arm, three recently dead individuals of *C. conoidea* were found in the leaf litter under native trees. The three broken shells appeared to have been predated. During extensive and complementary surveys in similar vegetation type at Bras des Merles (800 m a.s.l.), another river arm (not far from the previous area), on 9 December 2023, two living individuals of *C. conoidea* were found also in the leaf litter of native trees (Fig. 1). These two sites are only 1,500 m apart, but are separated by a ridge, the Crête de la Marianne (2,200 m a.s.l.). This is the first observation of living individuals of this species on Reunion. *Clatripoma conoidea* is morphologically close to *T. fimbriata*, but has a differently sculptured operculum, is smaller, has spiral costae, oblique and close

2



3



4



Figs 2–4. Subfossil specimens of *Clatripoma conoidea* from Reunion: 2, 3 – shells; 4 – operculum. Scale bars 7.5 mm (2), 6.5 mm (3), 4 mm (4)

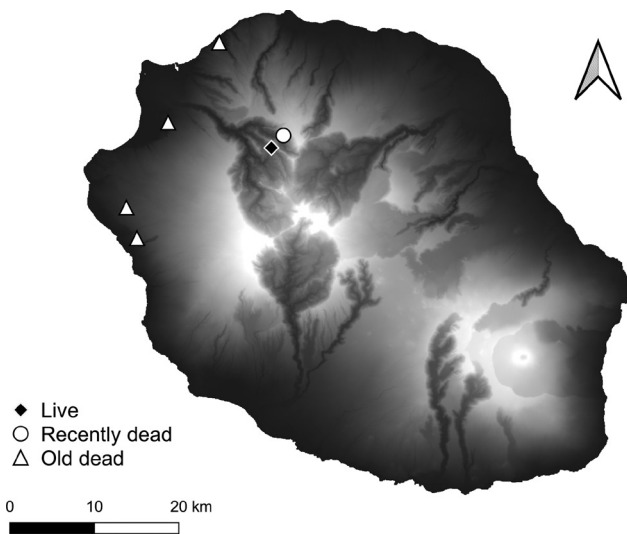


Fig. 5. Records of *Clatripoma conoidea* on Reunion indicating surviving population (Live), site where only dead empty shells were found (Recently dead) and sites where old dead were found in the literature (Old dead) (GRIFFITHS & FLORENS 2006)

radial striae (Figs 2–4), as opposed to spiral ridges in *T. fimbriata* (GRIFFITHS & FLORENS 2006). *Clatripoma conoidea* was recorded only from Mauritius (GERMAIN 1921), then more recently from subfossil specimens in four coastal localities on Reunion (STEVANOVITCH 1994, GRIFFITHS & FLORENS 2006). The indicated observations provide new insights into the species' distribution (Fig. 5), suggesting that *C. conoidea* would have once been widely distributed in the drier vegetation of the island, and that it became locally extinct as its habitat early disappeared, particularly along the west coast at lower elevation (STRASBERG et al. 2005).

Non-marine molluscs have a global high extinction rate mainly due to habitat destruction and the predation by alien species, which moreover appear to be underestimated, especially on oceanic islands that retain half of the global species richness of these taxa (RÉGNIER et al. 2017, FERNÁNDEZ-PALACIOS et al. 2021, PROIOS et al. 2021). The rediscovery of species considered extinct is exceptionally rare in the Mascarene archipelago (FLORENS & BAIDER 2007), and mainly concerns native plant species (ALBERT et al. 2017). In the last few decades, most terrestrial malacological discoveries in this region have involved species known only from subfossil shells, suggesting that they are almost certainly already extinct (GRIFFITHS 2000, GRIFFITHS & FLORENS 2004). This discovery highlights the urgent need for further studies to assess the geographical distribution

and the population state of this species on Reunion. The results will make it possible to evaluate its status, which seems to be Critically Endangered locally, given the highly restricted distribution and the small number of individuals observed (IUCN 2016). This discovery emphasises the need for urgent action, and to devise a conservation strategy to reduce the risks of extinction for this species, which is the last living representative of Pomatiidae on Reunion. Land snails typically have a limited active dispersal and conservation of these species using a habitat restoration approach seems most pertinent. One percent of the original surface of native lowland tropical dry forest area remains on Reunion island, most of which being heavily fragmented and threatened by invasive plant (STRASBERG et al. 2005). Among the threats and conservation issues, the frequent and abundant invasive predators that dominate land snail communities, such as *Euglandina rosea* (Férussac, 1821), are thought to be responsible for almost a third of known extinctions in oceanic islands (RÉGNIER et al. 2009).

Land snails with multi-island records on oceanic islands are unusual, and it seems unlikely that species maintain gene flow. Genetics comparisons between islands might help differentiate taxa with similar shells on different islands, and *C. conoidea* seems perfect to investigate that possibility in future work. These results will undoubtedly show that conservation of these taxa on an island-wide scale will be unavoidable through future captive rearing programs, as on other islands (HADFIELD et al. 2004, STRINGER & GRANT 2007, GARCIA et al. 2023). The conservation of habitats and predator control will then allow actions to be taken to strengthen the populations in situ.

These observations also suggest the potential for the rediscovery of other species in remnant drier habitats. Additionally, the recent discovery of a significant population of *C. conoidea* in an exotic *Araucaria* plantation (25 m a.s.l.) at Bras d'Eau, Mauritius, suggests the species can thrive in a completely transformed habitats. This finding suggests the possibility of discovering additional populations in Réunion (F. B. V. FLORENS pers. comm. Sept. 2024).

ACKNOWLEDGMENTS

Surveys that lead to the rediscovery of this species in Reunion were supported by the Office National des Forêts. We would also like to thank F. B. V. FLORENS and O. L. GRIFFITHS for their critical assessment of this manuscript, as well as the editor and three reviewers. We declare no conflict of interests.



REFERENCES

- ALBERT S., RHUMEUR A., RIVIÈRE J. L., CHAUVRAT A., SAUROY-TOUCOÛÈRE S., MARTOS F., STRASBERG D. 2017. Rediscovery of the mistletoe *Bakerella hoyifolia* subsp. *bojeri* (Loranthaceae) on Reunion Island: population status assessment for its conservation. *Botany Letters* 164: 229–236.
<https://doi.org/10.1080/23818107.2017.1340191>
- CADET T. 1977. La végétation de l'île de La Réunion: étude phytocéologique et phytosociologique. PhD thesis, Université d'Aix-Marseille, France.
- CHEKE A., HUME J. P. 2008. Lost land of the Dodo. An ecological history of the Mascarene Islands. Yale University Press, New Haven.
- DESHAYES G. P. 1863. Catalogue des mollusques de l'île de la Réunion (Bourbon). In: MAILLARD L. (ed.). Notes sur l'île de la Réunion (Bourbon). Dentu, Paris.
<https://www.biodiversitylibrary.org/item/47124>
- FERNÁNDEZ-PALACIOS J. M., KREFT H., IRL S. D. H., NORDER S., AH-PENG C., BORGES P. A. V., BURNS K. C., de NASCIMENTO L., MEYER J.-Y., MONTES E., DRAKE D. R. 2021. Scientists' warning – The outstanding biodiversity of islands is in peril. *Global Ecology and Conservation* 31: e01847.
<https://doi.org/10.1016/j.gecco.2021.e01847>
- FLORENS F. B. V., BAIDER C. 2007. Relocation of *Omphalotropis plicosa* (Pfeiffer, 1852), a Mauritius endemic land snail believed extinct. *Journal of Molluscan Studies* 73: 205–206.
<https://doi.org/10.1093/mollus/eym004>
- GARCIA G., RICHARDSON K., PRINCE H., KELTON K., LAMBERT K., PAPP T. 2023. Preventing extinction: the past decade of snail conservation at Chester Zoo. *Tentacle* 31: 41–44.
- GERMAIN L. 1921. Faune malacologique terrestre et fluviatile des îles Mascareignes. F. Gauthier et A. Thébert, Paris.
- GRIFFITHS O. L. 2000. Nine new species of Mascarene land snails (Mollusca: Gastropoda). *Molluscan Research* 20: 37–50.
<https://doi.org/10.1080/13235818.2000.10673732>
- GRIFFITHS O. L., FLORENS F. B. V. 2004. Ten new species of Mascarene land snails (Mollusca: Gastropoda) and their conservation status. *Molluscan Research* 24: 161–177.
<https://doi.org/10.1071/MR04015>
- GRIFFITHS O. L., FLORENS F. B. V. 2006. A field guide to the non-marine molluscs of the Mascarene Islands (Mauritius, Rodrigues and Réunion) and the Northern Dependencies of Mauritius. Bioculture Press, Mauritius.
- HADFIELD M. G., HOLLAND B. S., OLIVAL K. J. 2004. Contributions of *ex situ* propagation and molecular genetics to conservation of Hawaiian Tree Snails. In: GORDON M. S., BARTOL S. M. (eds). *Environmental Approaches to Conservation Biology*. University of California Press, Berkeley.
- HUME J. P. 2019. Systematics, morphology and ecology of rails (Aves: Rallidae) of the Mascarene Islands, with one new species. *Zootaxa* 4626: 1–107.
<https://doi.org/10.11646/zootaxa.4626.1.1>
- IUCN 2016. Rules of Procedure for IUCN Red List Assessments 2017–2020. Version 3.0. Approved by the IUCN SSC Steering Committee in September 2016.
- NEUBERT E. 2009. The continental malacofauna of Arabia and adjacent areas. VI. Pomatiidae of Arabia, Socotra and Northeast Africa, with descriptions of new genera and species (Gastropoda: Caenogastropoda: Littorinoidea). *Fauna of Arabia* 24: 47–127.
- NEVILL G. 1881. New or little-known Mollusca of the Indo-Malayan fauna. *Journal of the Asiatic Society of Bengal, Part II*, 50 (3): 125–167.
<https://www.biodiversitylibrary.org/item/110180#page/167>
- PROIOS K., CAMERON R. A., TRIANTIS K. A. 2021. Land snails on islands: building a global inventory. *Frontiers of Biogeography* 13: e51126.
<https://doi.org/10.21425/F5FBG51126>
- RÉGNIER C., FONTAINE B., BOUCHET P. 2009. Not knowing, not recording, not listing: Numerous unnoticed mollusk extinctions. *Conservation Biology* 23: 1214–1221.
<https://doi.org/10.1111/j.1523-1739.2009.01245.x>
- RÉGNIER C., FONTAINE B., COWIE R. H., BOUCHET P. 2017. Measuring the sixth extinction: what do mollusks tell us? *The Nautilus* 131: 3–41.
- RIVALS P. 1952. Etude sur la végétation naturelle de l'île de La Réunion. PhD thesis, Université de Toulouse, France.
- STEVANOVITCH C. 1994. Protection des mollusques terrestres de la Réunion. Rapport d'étude commandé par le Ministère de l'Environnement. Muséum d'Histoire Naturelle de Paris, Paris.
- STRASBERG D., ROUGET M., RICHARDSON D. M., BARET S., DUPONT J., COWLING R. M. 2005. An assessment of habitat diversity and transformation on La Réunion Island (Mascarene Islands, Indian Ocean) as a basis for identifying broad-scale conservation priorities. *Biodiversity and Conservation* 14: 3015–3032.
<https://doi.org/10.1007/s10531-004-0258-2>
- STRINGER I. A. N., GRANT A. 2007. Captive rearing and biology of the land snails *Placostylus ambagiosus* and *P. hongii* (Pulmonata: Bulimulidae). DOC Science & Technical Series 279. Department of Conservation, Wellington, New Zealand.

Received: October 24th, 2024

Revised: December 18th, 2024

Accepted: December 21st, 2024

Published on-line: March 4th, 2025

