

Citizen Science in the East Pacific Marine Realm: Bivalves Under Scrutiny

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INTRODUCTION & AIM

In an era of global change, rapid assessments are necessary to obtain reliable and updated information on the geographic distribution of the living organisms, with view to properly implementing conservation measures (Zapponi et al., 2016). In this context, citizen science and community-based monitoring appears as valuable tools to contribute to biodiversity monitoring.

The usefulness of citizen science was largely proved in the last years by a number of projects performed in different parts of the world, particularly on terrestrial and freshwater organisms. Less clear yet is the potential contribution of citizen science in the marine realm and, particularly, when considering invertebrate taxa.

This study searches to evaluate the current impact of the iNaturalist platform on the knowledge of marine bivalves along the Pacific coast of the Americas.

METHOD

All marine bivalve observations along the East Pacific coast, from Alaska (71.39°N) to Cape Horn (54.86°S) (to mid-June 2024) were mined from the iNaturalist platform. The geographic and taxonomic coverage of these observations, and the accuracy of this dataset, is here critically evaluated. This information is contrasted with the currently available scientific knowledge on the bivalve diversity from the area (Coan et al., 2000; Coan & Valentich-Scott, 2012; Güller & Zelaya, 2015; Valentich-Scott et al., 2020).

RESULTS & DISCUSSION

A total of 77,207 marine bivalve observations, comprising 572 species and 62 families, are currently available in iNaturalist. This encompasses 45% of the total number of species and 78% of the total number of families currently known from the Eastern Pacific. Most of the available observations in iNaturalist (80.5%) come from North America, followed by records from Central America (14.8%), and only 4.7% from South America (Figure 1A). Most of the available observations (76.7%) appear identified at species level, while the remaining observations refer to higher taxonomic categories (Figure 1B). Out of the identified observations, 57.7% are currently categorized as 'Research Grade', 41.2% as 'Needs Identification', and 1.1% as 'Casual' (which includes doubtful records) (Figure 1C).

However, most of the species and families still have a reduced number of observations in iNaturalist (Figures 2 and 3). At species level, *Mytilus californianus* appears as the taxon accounting for the greatest number of observations (more than 14,000), and consequently, Mytilidae is the family with the greatest number of observations.

The available information seems to expand the known distribution of several species. However, the fact that many novel observations represent species from other parts of the world (Indo-Pacific, Europe, Oceania) highlights the need for proper scientific identification.

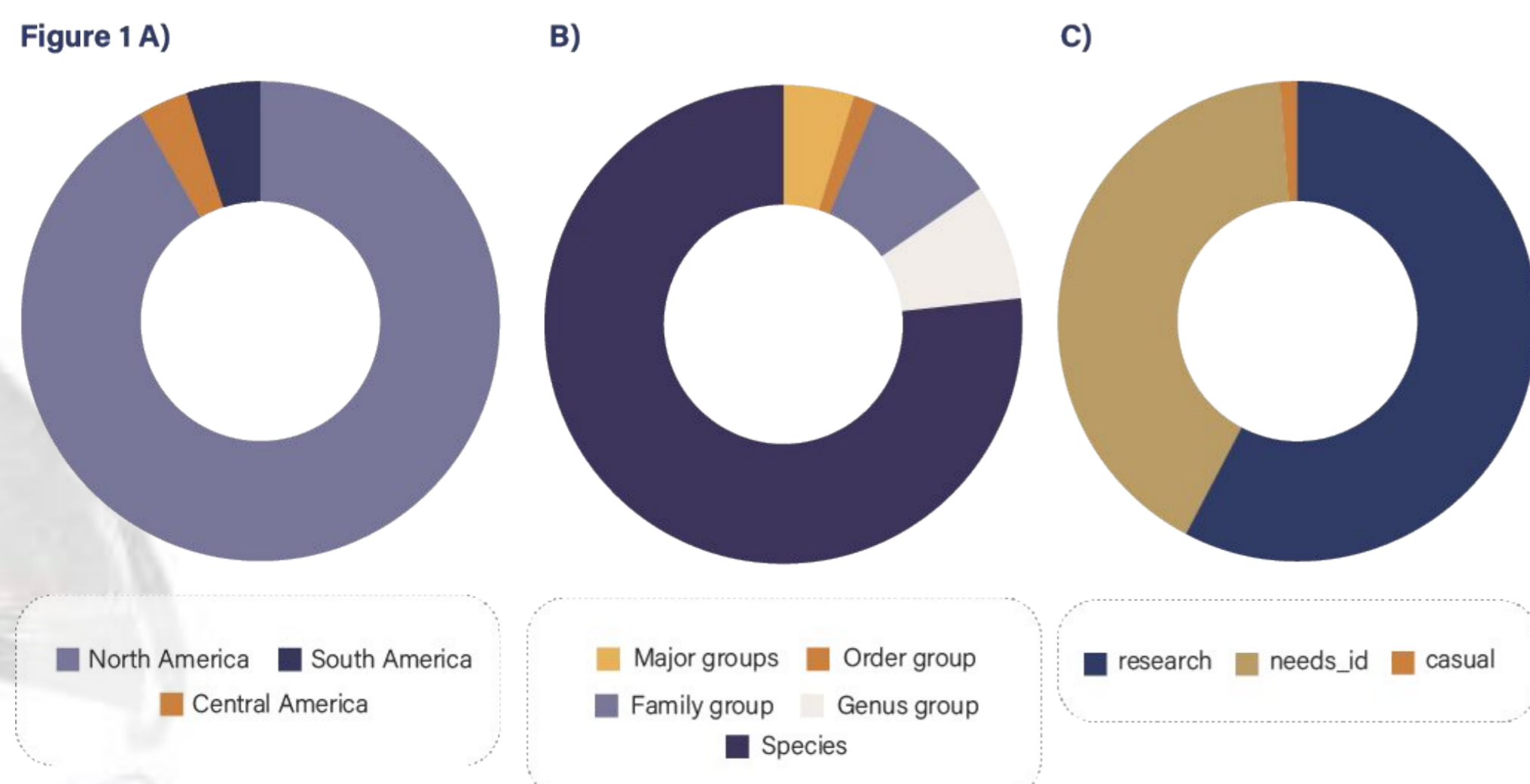


Figure 1: A) Observations by Subcontinent: Distribution of marine bivalve observations by subcontinent along the East Pacific coast (up to mid-June 2024). B) Observations by Taxonomic Group: Number of observations by taxonomic group. C) Identification Quality: Breakdown of observations by identification quality: "Research Grade," "Needs ID," and "Casual."

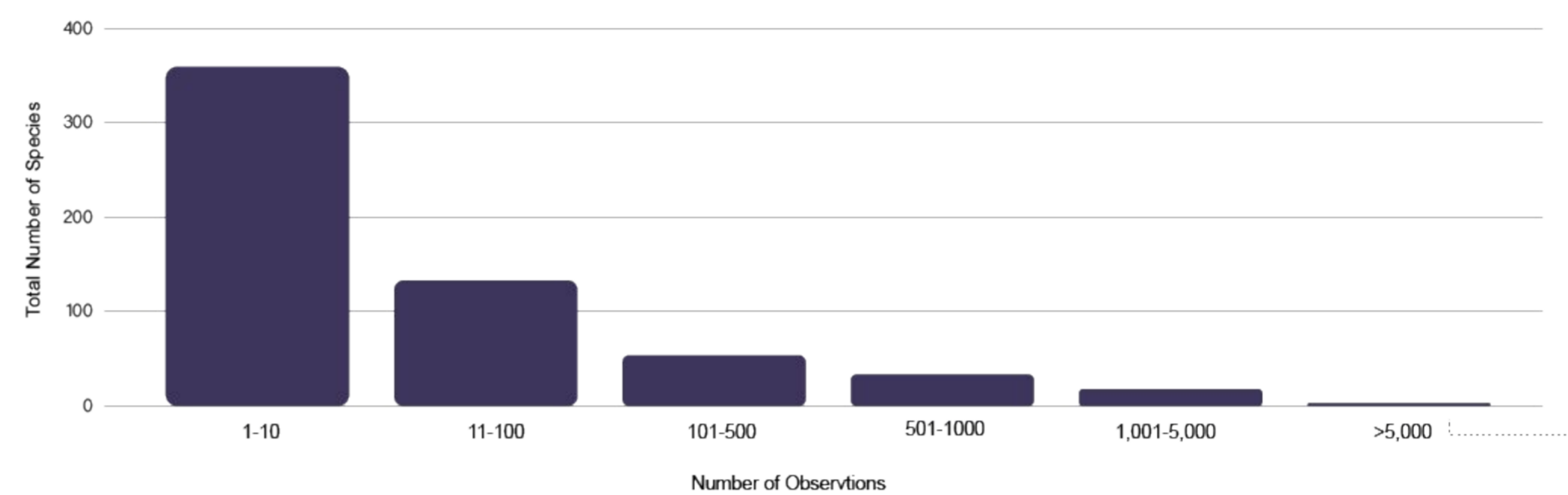


Figure 2: Species Count by Number of Observations: Number of species within each range of observations.



Image of *Mytilus californianus* Conrad, 1837, provided by the Naturalis Biodiversity Center, under Creative Commons Zero (CC0) license. Naturalis Biodiversity Center - RMNH.MOL.317927.

Mytilus californianus, the most frequent species along the eastern Pacific coast, with over 14,000 observations on iNaturalist.

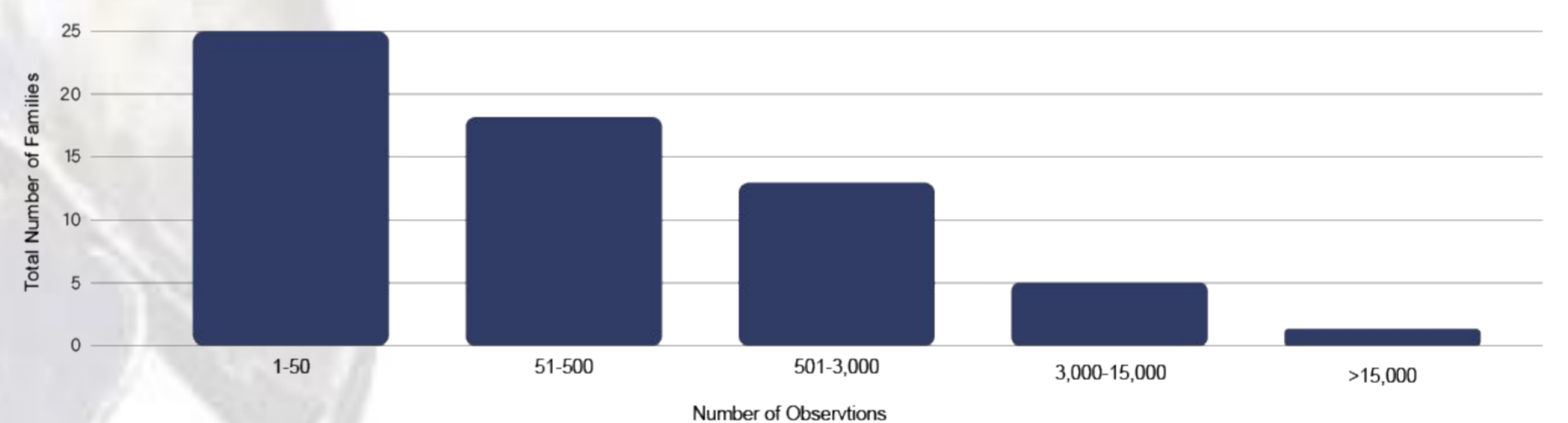


Figure 3: Families Count by Number of Observations: Number of families within each range of observations.

CONCLUSION

Marine bivalves from the Eastern Pacific appear as a suitable group of invertebrates to be monitored by citizen science: they are widely diversified and abundant, and their shells are usually seen, found (and even collected) by people. In addition, a series of monographs published in the last years allows an accurate identification of the species. In this regard, citizen science appears as a valuable tool, as a complement to traditional scientific research, for monitoring bivalves, particularly considering most large-sized species. Despite that, the information on this group available to date in iNaturalist is limited. This phenomenon is registered both at a geographic scale (particularly in the case of South America) and at a diversity scale, with more than half of the species not yet documented in this platform. These facts reflect the value of iNaturalist as a compliment for traditional scientific research.

FUTURE WORK / REFERENCES

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