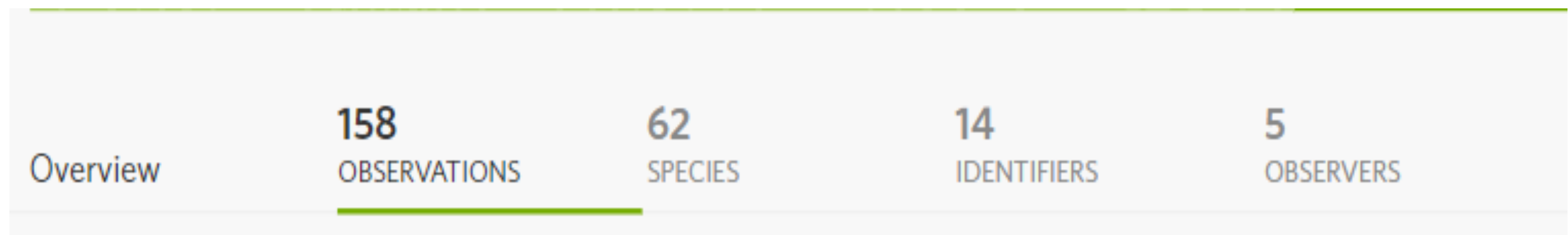


Abstract



Introduction



Flora de Batipa: Documenting Species with iNaturalist

By: Salvador Ayala¹ Natali Hernandez¹, and Ebony Schultz², Dr. Benjamin van Ee³, Humberto Venado⁴
Heritage University¹, United Tribes Technical College², University of Puerto Rico³⁼

Abstract

This study is a representation of the plants we observed at their flowering stage in their life cycle. The area of study is located at Batipa, Panama during May of 2024. Batipa has a tropical climate with two distinct seasons: a dry summer and a wet winter. The data were collected during the beginning of the wet season. The topography of the study's location includes mangrove forests at sea level to tropical evergreen forests in the foothills and mountains. (*World Bank Climate Change Knowledge Portal, n.d.*) It is important to note that this area has been used to grow and cultivate Teca; there are extensive Teca forests in the foothills that have been growing anywhere from 1 year to 30 years.

Introduction

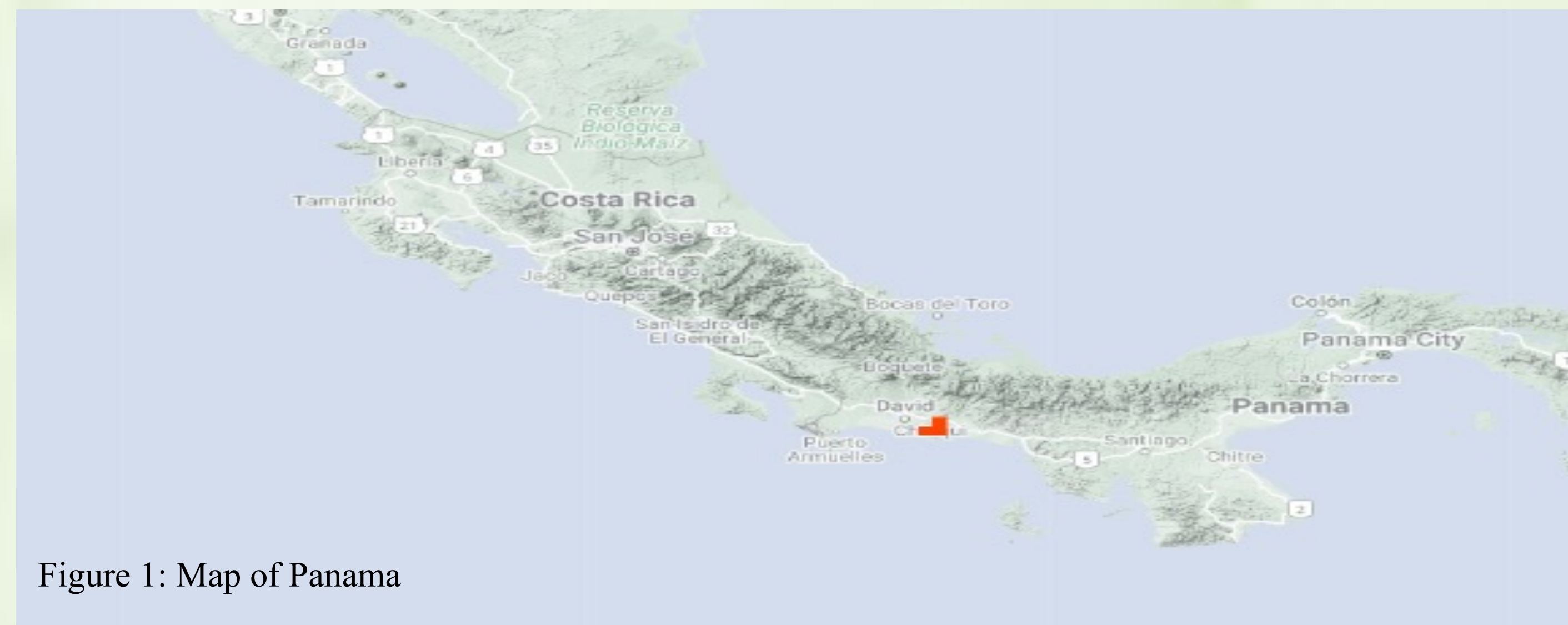


Figure 1: Map of Panama

This project entails using the application iNaturalist to document the flowering species of plants in Batipa. This is critical as Batipa is a field institute of the Universidad Tecnológica Oteima and part of their aim is to preserve the plant and wildlife on 600 ha of land. It is important to know what species exist in this area that is preserved. (*BATIPA FIELD INSTITUTE - Research and Education for Conservation and Sustainability Mission: Applying Science and Education for the Conservation and Sustainable Management of Natural Resources, n.d.*) Panama houses roughly 10,000 species of plants. The vast diversity of plant life is important to conserve the state of the ecosystem. The data collected will provide valuable insights into the region's flora, supporting ongoing conservation efforts and promoting sustainable practices. (*Muthert et al., 2020*).

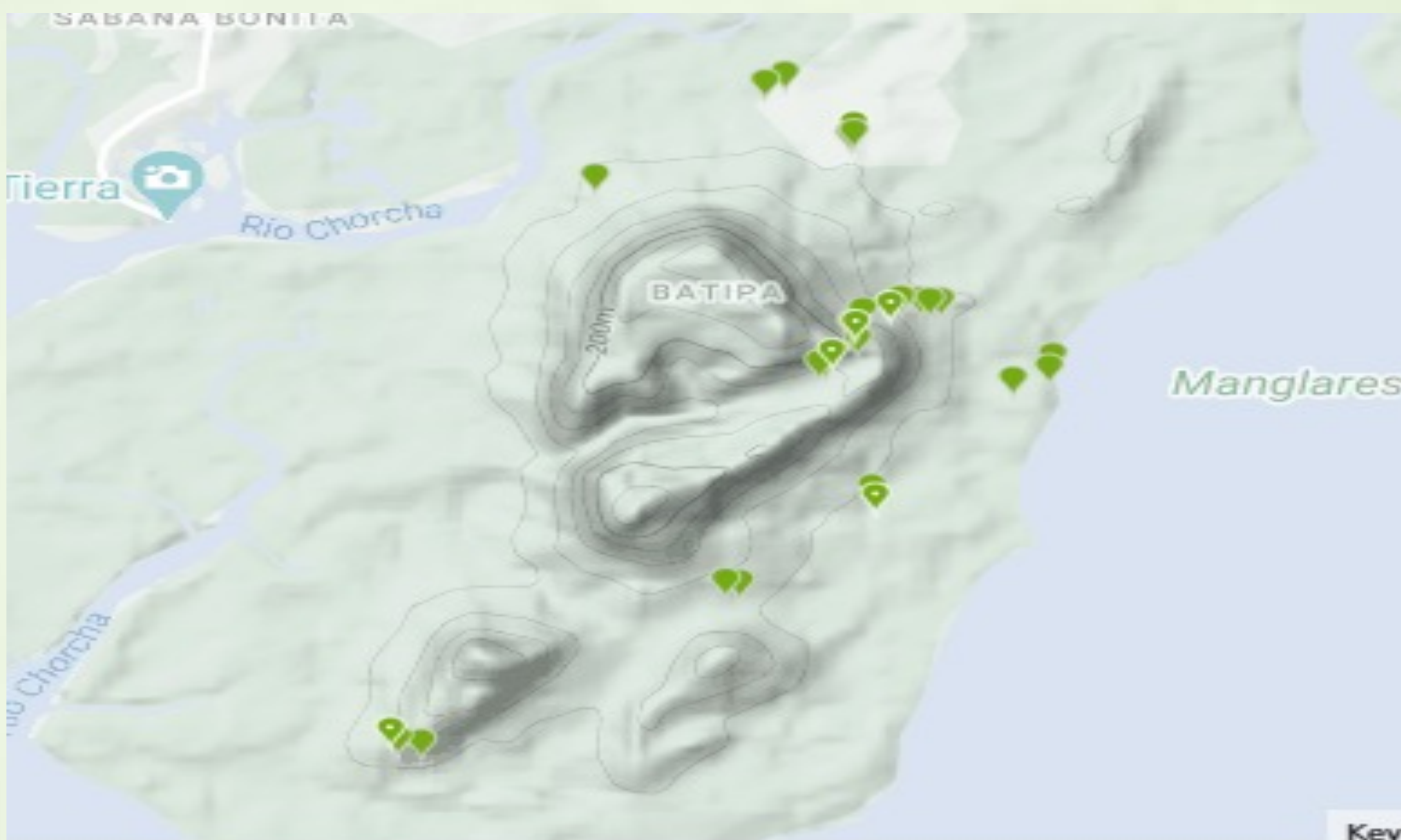


Figure 2: Area of Study—Green Indicates Observation Points

Methods

- Utilized smartphones (iPhone and Samsung) and the iNaturalist app for species identification, data collection, user contributions, and community engagement
- Captured over four photos per observation from different angles of leaves, flowers, stems, and trunks to enhance species identification and classification using iNaturalist's computer vision capabilities observation were made from the 20th -27th May, 2024.
- Collaborated with 20 identifiers, including Mabelin, a photographic documenter from Panama, to gather additional observations for the project.

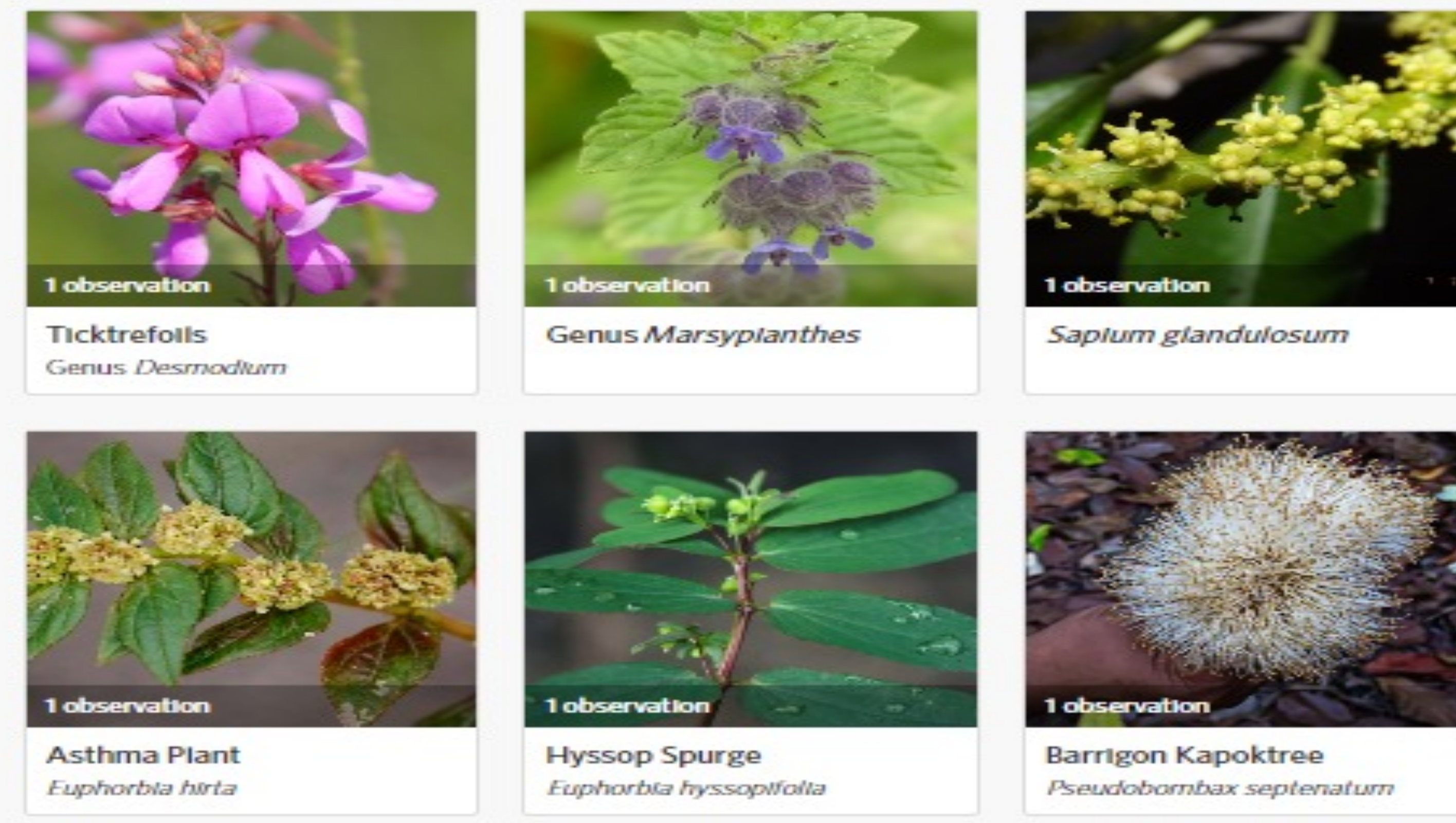


Figure 3: These are some of the observations made by the project members. As you can see, we were able to identify each of these observations to the species level using iNaturalist.

"Observations." *iNaturalist*, 2024, www.inaturalist.org/observations.

Results

- 254 Observations Captured and 101 distinct species identified across various taxonomic groups, enhancing the understanding of Batipa's biodiversity.
- 40% of the overall collected observations were able to be identified.
- The results are not complete as this is a living project, more observations and identifications can be added.

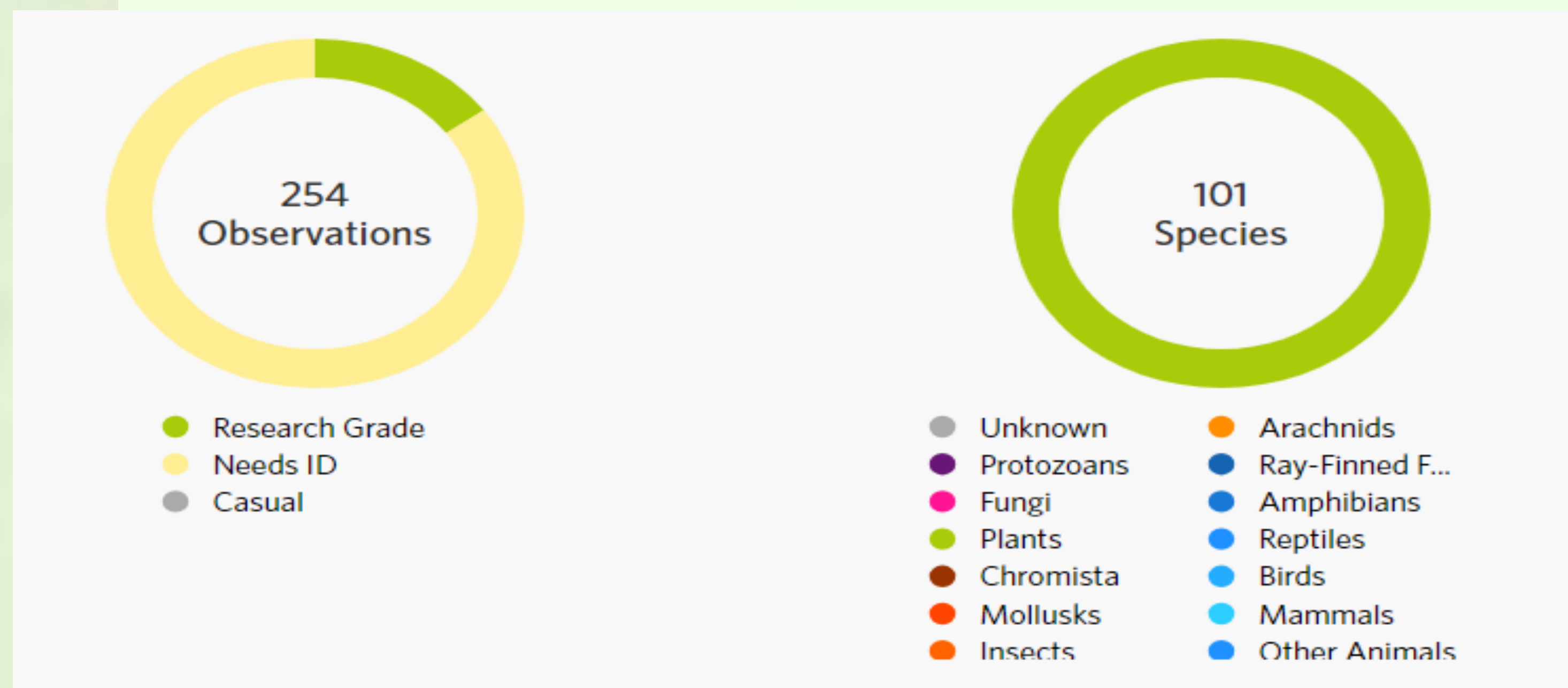
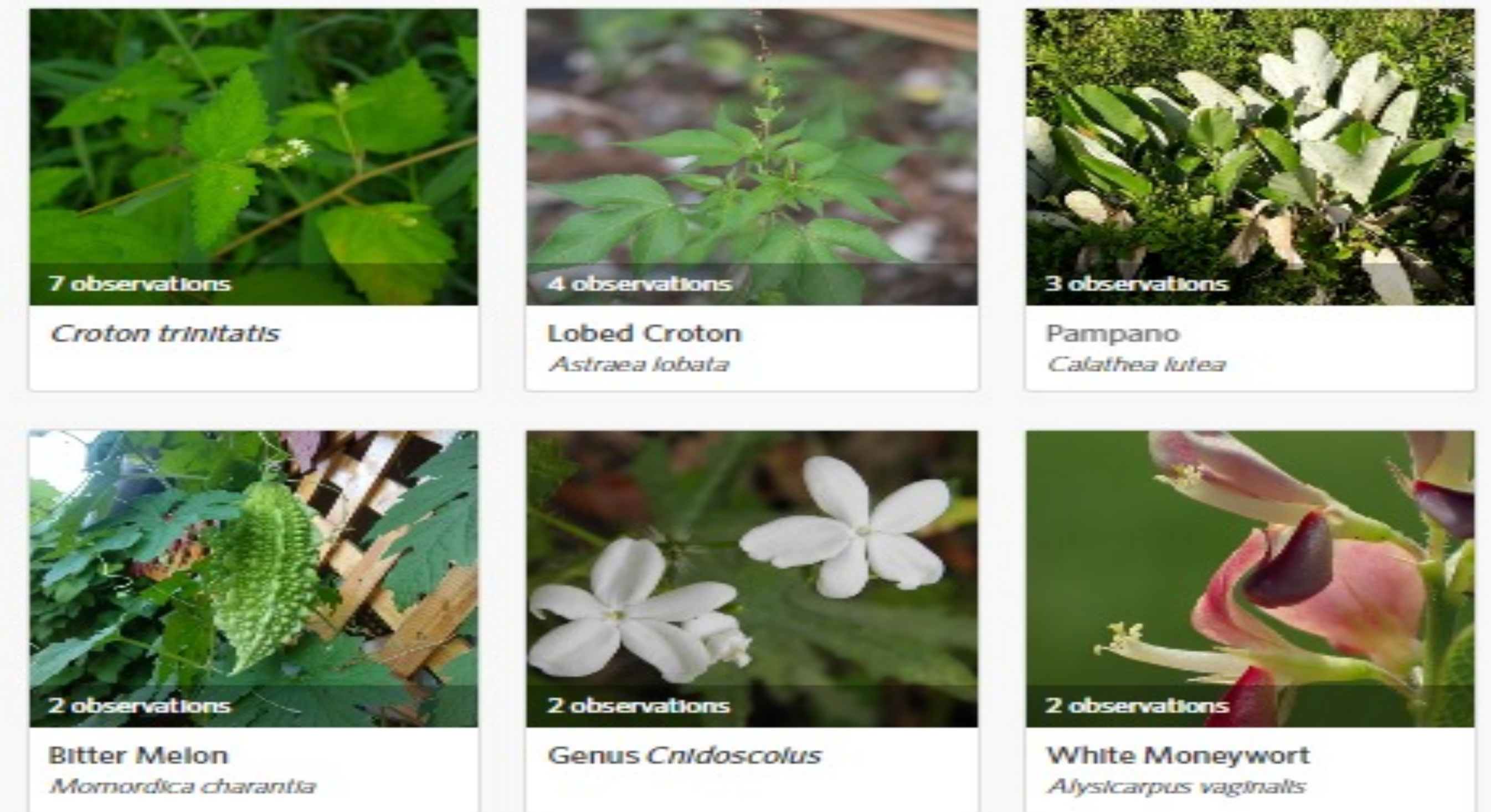


Figure 4: Statistics from the iNaturalist app showing 254 observations categorized by research grade, needs ID, and casual observations. Diversity of species identified, showing a total of 101 species categorized by different taxonomic groups such as plants, fungi, insects, mammals, and others

Discussion

Some species were easier to recognize than others because it was possible that these plants had not identified before. This project is open for continued collaboration and contributions from the community to help collect more species and locate these species in Batipa. Out of the 254 observations, we still need to work on completing the identification of rest of the observations.



Conclusion

- Successfully utilized iNaturalist and community collaboration to document and identify the diverse flora of Batipa.
- Enhanced understanding of the region's botanical diversity through detailed photographic observations and expert identifications
- Demonstrated the power of citizen science and technology in biodiversity conservation.
- Recommended future efforts to expand the database, promoting environmental education and further community engagement.

References

BATIPA FIELD INSTITUTE - Research and Education for Conservation and Sustainability Mission: Applying science and education for the conservation and sustainable management of natural resources. (n.d.). Retrieved May 27, 2024, from <https://www.oteima.ac.pa/web3/wp-content/uploads/2017/09/BATIPA-FIELD-INSTITUTE.pdf>

Muthert, L., Izzo, L., van Zanten, M., & Aronne, G. (2020). Root Tropisms: Investigations on Earth and in Space to Unravel Plant Growth Direction [Review of *Root Tropisms: Investigations on Earth and in Space to Unravel Plant Growth Direction*]. *Root Tropisms: Investigations on Earth and in Space to Unravel Plant Growth Direction*, 10. <https://doi.org/10.3389/fpls.2019.01807>

Observations. iNaturalist, 2024, www.inaturalist.org/observations

World Bank Climate Change Knowledge Portal. (n.d.). <https://climateknowledgeportal.worldbank.org/country/panama/climate-data-historical#:~:text=Panama%20has%20a%20hot%20and>

Acknowledgements

This project was funded by the NSF Hispanic Serving Institution Program: Culturally Responsive Education in STEM (CRESCENT) Award 1928570 to J. Black and NSF EAGLES S-STEM Award #1930564. Thank you to the Universidad Tecnológica Oteima and Edmundo Cruz Gonzalez for hosting our team and allowing us to utilize their land to complete this project. Thank you to Dr. Jessica Black and Dr. Ben van Ee for sharing their knowledge and time.

