

Census of potential predators and competitors of juvenile sandfish (*Holothuria scabra*) in sea ranches in Eastern Samar, Philippines

Racelle R. Rescordado, Jonh Rey Gacura, and Maragarita T. de la Cruz
 Guiuan Development Foundation, Inc.
 racellerescordado@gmail.com

Sea ranching is an effective aquaculture method that cultivates marine species in their natural habitat promoting the sustainable use of marine resources and reducing pressure on wild populations. Sea ranching stimulates local economies by producing high-value species like *Holothuria scabra* (sandfish). In the Philippines, sandfish sea ranching utilizes second-stage juveniles of less than 3 grams to grow in sea ranches. However, predation threatens the stocked juvenile sandfish populations from reaching harvestable size. Notably, these potential predators, and competitors on sea cucumber ranches and their spatial and temporal variability are still unknown, thereby emphasizing the need to identify them.

Therefore, this study seeks to identify potential predators and competitors of sandfish in sea ranches during wet and dry seasons, explore the size most vulnerable to predation, and assess their abundance based on lunar phase variation.

Methodology

The study was conducted from October 2020 - March 2021 in two sites in Eastern Samar, Philippines: Maliwaliw Island in Salcedo and Cabungaan in Mercedes. Maliwaliw Island, has a fine to coarse sandy bottom, while Cabungaan, features a sandy muddy bottom with sparse rock boulders and *Sargassum* sp. located beside a natural brackish passage. Water depths ranging from 0.3 to 2.0 meters were chosen for their distinct habitat characteristics and ongoing sea cucumber farming activities.

Bait Sizes

C1	3.00-9.99 g	x	5 Traps
C2	10.00-24.99 g	x	5 Traps
C3	25.00-34.99 g	x	5 Traps
C4	35.00-49.99 g	x	5 Traps
C5	50.00-85.00 g	x	5 Traps

25 traps per set

Trap Setup

-  40x30x15 cm (LWH)
-  Baits are tied inside the trap
- Lunar Phase**
 Full Moon
  New Moon
- Duration**
 12 HOURS AM, 12 HOURS PM, 24 HRS

25 + 25 + 25 = 75 traps for a total of 24 hours

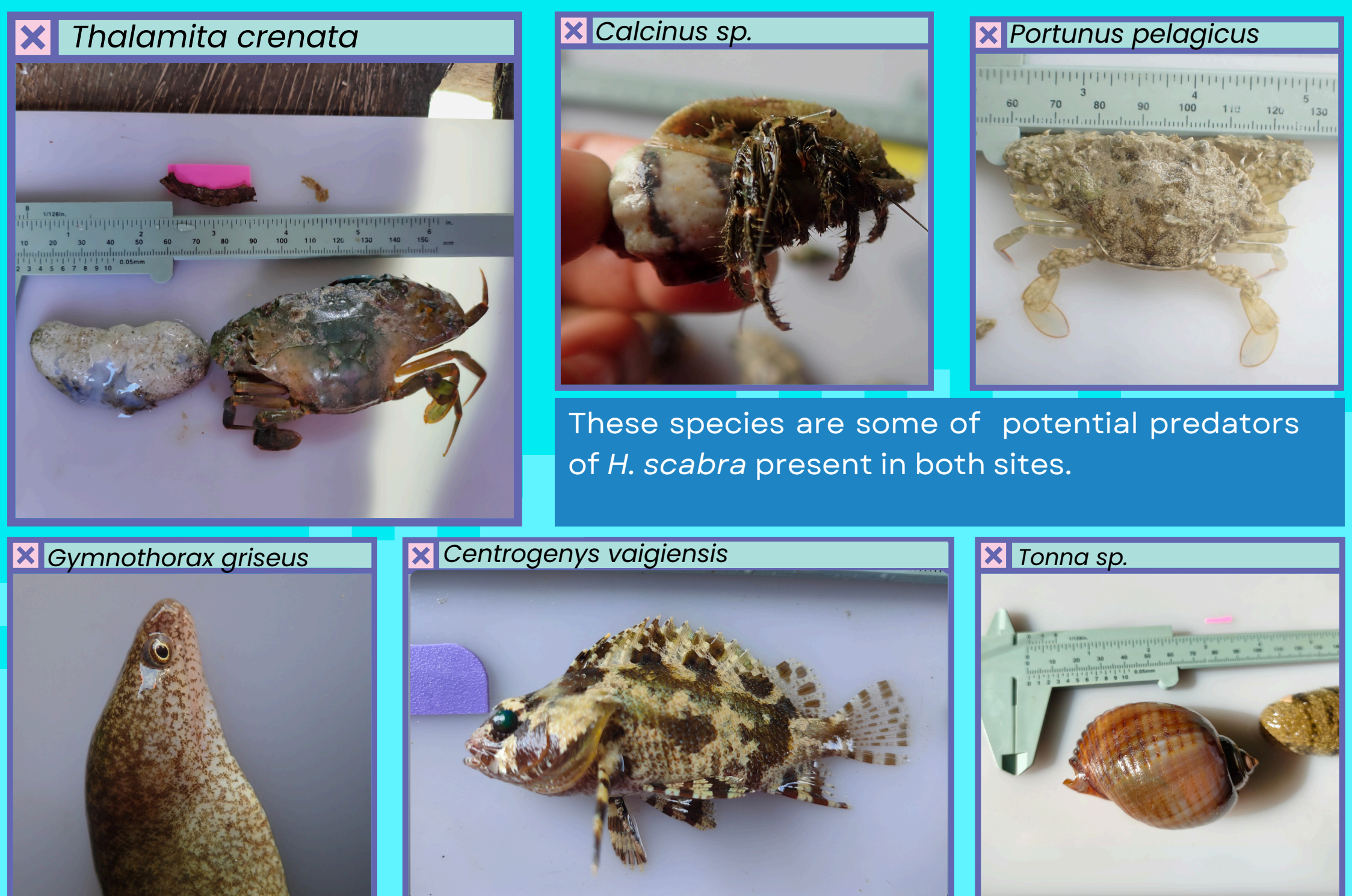
A total of **600 traps** were deployed throughout the study, with variations in setup times (12 hours day/night and 24 hours) across different lunar phases and time of the year.

Results

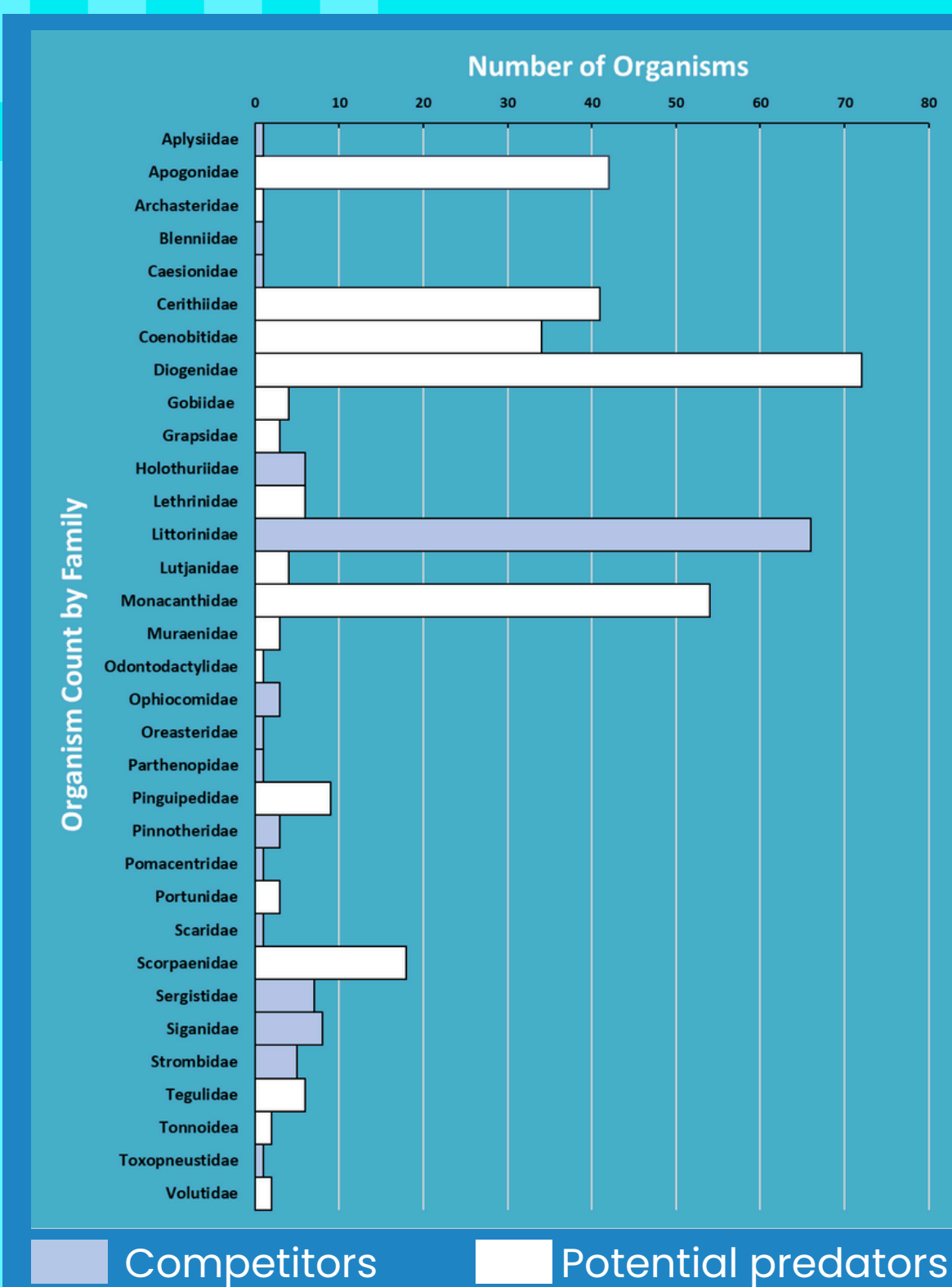


Pinch marks and laceration observed on *H. scabra* with *Thalamita crenata* inside the traps.

17 Families with 19 genera identified as potential predators based on feeding habit and bite marks on the sandfish bait where they were observed



These species are some of potential predators of *H. scabra* present in both sites.



Discussion

- A total of 411 organisms belonging to 34 families and 39 genera were recorded, among which 17 families and 25 genera are identified as potential predators.
- Traps baited with 3.00-9.99g attracted the greatest number of potential predators.
- Notably, organisms exhibited an average length of 4.41 cm
- Site-specific observations showed that Maliwaliw recorded higher number of potential predators, while Cabungaan recorded larger crabs and sandfish bearing bite marks.
- The influence of lunar cycles emerged prominently, with the new moon phase correlating significantly with heightened predator activity, recording a peak of 241 individuals. Significant increases in organism recordings during the new moon phase ($p < 0.0202$) and specific time ranges ($p = 0.01186$), elucidates the correlation of lunar and diurnal factors in predation dynamics.

Conclusion and Recommendation

The study highlights the importance of understanding predator-prey dynamics in sandfish sea ranching, revealing increased predator activity during the new moon and a preference for smaller bait sizes. Site-specific differences and seasonal variations suggest the need for customized predator control and stocking during the dry season to reduce susceptibility. To enhance sustainability and productivity, it is recommended to implement protective measures during new moon phases and release larger juveniles (>5 cm). These strategies will mitigate predation, improve juvenile survival rates, and support the economic viability of sandfish sea ranching.

References

Caasi OJC, Gosselin LA, Junio-Meñez MA (2023). Size dependent predation on juvenile sandfish, *Holothuria scabra* by seagrass-associated crabs. *Journal of the Marine Biological Association of the United Kingdom* 103, e84, 1-13. <https://doi.org/10.1017/S002531562300073>

C. Gorospe, J.R., Rescordado, R.R., Junio-Meñez, M.A., Cruz, M. & Southgate, P.C. (2023) Census of potential predators and competitors of sandfish, *Holothuria scabra*, juveniles during floating hapa ocean nursery culture. *Aquaculture, Fish and Fisheries*, 3, 316-328. <https://doi.org/10.1002/aff2.104>

Junio-Meñez, M. A., Paña, M. A., de Peralta, G. M., Catbagan, T. O., Olavides, R. D. D., Edulantes, C. M. A., & Rodriguez, B. D. D. (2012). Establishment and management of communal sandfish (*Holothuria scabra*) sea ranching in the Philippines. In *Asia-Pacific tropical sea cucumber aquaculture. Proceedings of an int. symp. held in Noumea, Canberra* (pp. 121-127).

