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Relative abundance of clown fishes from North Bay Island of Andaman Sea

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Introduction

Aquarium keeping is amongst the most popular of hobbies with millions of enthusiasts worldwide. European Union is the largest market for ornamental fish; however, the United States (US) is the single largest importer of ornamental fish in the world (Chapman, 2000). The hobby of maintaining an aquarium with ornamental fishes and the associated activities like collection, captive culture, fish breeding, aquarium product manufacture, distribution, whole sale and retail trade are growing very rapidly in the last few decades. It has been estimated that 1.5 – 2 billion aquariums are being kept in households worldwide with more than 600,000 in the US alone (Lewbart *et al*., 1999). Unlike freshwater aquaria species, where 90% of fish species are currently farmed, the great majority of marine aquaria stocked are from wild caught species (Andrews, 1990).

Family Pomacentridae includes 320 species which occur in coral reef areas and shallow rocky seas (Allen, 1991). Among the different marine ornamental fishes, in the family Pomacentridae genes *Amphiprion* and *Premnas* are there. Which comes under sub family Amphiprioninae commonly known as "clown fishes or sea anemone fishes" are ranked as one of the most popular attractions all over the world because of their tiny size, hardiness, attractive colour features, peaceful nature, high adaptability to live in captive condition, they can easily take prepared feed and their fascinating display behaviour which having symbiotic relationship with the sea anemones. In the reef fish the one which bred and reared in captive conditions was the Clownfish.

In India research on marine ornamental fishes is still in its infancy. Comprehensive information on taxonomy, distribution and ecology is scanty for many groups of marine ornamental fishes including Pomocentrids from Indian waters. So that in present study the method called as the Line Intercept Transect (LIT) method (English *et al.*, 1997) has been followed for successful estimation of ornamental fish resources from North Bay of Andaman Sea.

Materials and methods

Study Site

For the present study North Bay site was selected. North Bay is about 4.5 – 5 km from Port-Blair with rich Coral reefs (Plate.1) and survey site was at (11^{0}42'09.11" N and 92^{0}43'12.8" E).

Transect survey

The aim of the survey was to measure *in-situ* environmental, hydrographical parameters and habitat of clown fish from different regions of Andaman Sea. The method of survey, which is also called as the Line Intercept Transect (LIT) method (English *et al*., 1997), was followed for successful estimation of ornamental fish resources of the islands, in which the survey was carried out by using a measuring tape of 30 or 50 m. The transact was made parallel to the beach\ shore at the desired depth

up to 5-10 m to know the abundance of reef-fish which was difficult because of the diversity and mobility of fishes found on reef habitats, as well as the cryptic nature and behaviour of some species (Sale , 1980).

At selected site five transects were carried out for estimation of relative abundance. During transect survey readings were recorded in an underwater note book and transferred to field notebook after the survey. The anemone fishes occurred along the transect and on both sides upto 2.5 m visibility range were recorded. The relative abundance of the fish was calculated as follows:

$$RA = \frac{\text{Abundance of species}}{\text{Abundance of all species}} \times 100$$

Statistical analysis

Relative abundance of each species was analysed using one-way analysis of variance (ANOVA) using SPSS 15.0 for Windows. The Student's Newman Keul multiple range test was used for post hoc comparison of mean ($P<0.05$) between different species.

Results

Relative abundance at North Bay

The average relative abundance of anemone fishes at North Bay is shown in table.1. The relative abundance recorded was 25.94 and 3.85 % for *Amphiprion akallopisos* and *Amphiprion ocellaris* respectively (Fig.1). One-way ANOVA was applied which revealed significant difference ($P<0.05$) between relative abundance of anemone fishes. The Student's Newman Keul multiple range test indicated that the relative abundance of *Amphiprion akallopisos* was significantly different from *Amphiprion clarkii*, *Amphiprion ocellaris* and *Amphiprion percula*. However, the relative abundance of *Amphiprion akallopisos*, *Amphiprion ephippium* and *Premnas biaculeatus* was not significantly different ($P>0.05$) (Table 2).

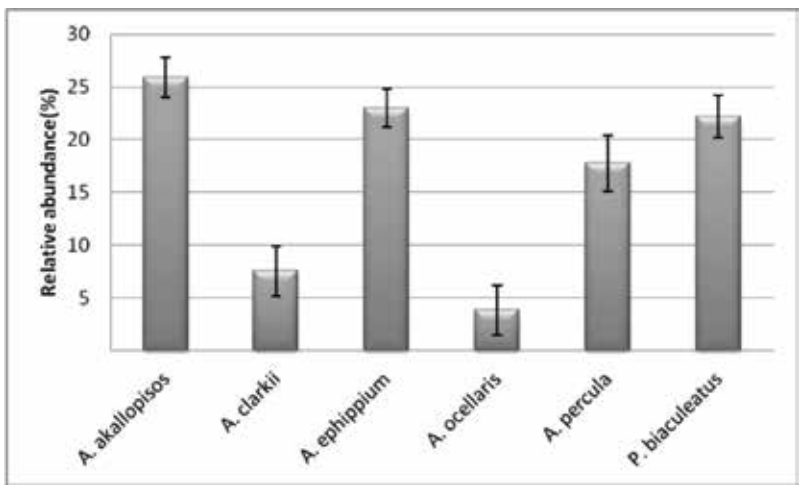

Fig1: Relative abundance (RA) values as percentage of occurrence for each species in North Bay.

Table.1: The average Relative abundance of Anemonefish at North Bay.

Species name	AA	AC	AE	AO	AP	PB
Average No. Sp	10±1.38	2.8±0.97	8.6±0.51	1.6±O.98	6.8±1.24	8.4±1.03
Average Relative abundance	25±1.91	7.5 ±2.35	23±1.79	3.9±2.37	17.8±2.65	22.2±1.12

(Values in the parentheses are ± SE)

Table.2: Ranking as per the average relative abundance of anemonefish at North Bay (SNK)

Rank	1	2	3	4	5	6
Species	AA	AE	PB	AP	AC	AO
Relative abundance	25 ± 1.74^{a}	23 ± 1.27^{ab}	22.2 ± 1.12^{ab}	17.8 ± 1.58^{b}	7.5 ± 1.86^{c}	3.9 ± 1.53^{c}

$^{a, b, c}$ with different superscripts indicates significant difference

Discussion

The marine ecosystems of Andaman & Nicobar are unique and fragile and are blessed with rich bio-resources and endemic fauna and flora. Coral reefs of these islands are one of the richest and harbours many ornamental fishes. Damsel fishes are the commonly found ornamental fishes of Andaman which are having significant demand in domestic as well as export market. In the present study bionomics *i.e.* comprehensive ecology has been carried out using Line Intercept Transect method given by English *et.al* 1997. At North Bay survey site analysis of observations shows that the relative abundance of *Amphiprion akallopisos*, *A. ephippium, P. biaculeatus, A.percula, A. clarkii and Amphiprion ocellaris* were 25.94, 22.96, 22.18, 17.74, 7.52 and 3.85 % respectively.

Field observations by Rema and Madhu (2007) have shown the occurrence of *A.clarkii, A.ephippium, Amphiprion ocellaris, A.percula, A. sandaracinos* and *P.biaculeatus* from North Bay region of Andaman Sea. The present study is in agreement with the observation of the above mentioned authors. However, in the present study *A.sandaracinos* has not been recorded anywhere in the five transects carried out at North Bay.

The personal communication from Ramesh (2009) revealed that the presence of five dominant species of anemone fish at North Bay region *i.e. Amphiprion akallopisos* is (5.3%) followed by *A.percula* (1.4%), *A.ephippium*, *Premnas biaculeatus* and *Amphiprion clarkii*. Another observation by the author is that in undisturbed area the abundance is high, compared to the abundance in the semi-disturbed and disturbed area. Data collected in the present study showed that relative abundance of *A.akalloposis* was 25.94 %, *A.percula* was 17.74%, *Premnas biaculeatus* was 22.20% which was higher as compared to Chidiyattappu. Increased numbers indicate that dominance of this species increased with time, and due to the richness of reef biodiversity with lustrous underwater life forms at North Bay (Grinson, 2010).

Conclusion

In the present study, we succeeded in finding out relative abundance of Clown fishes at North Bay region of Andaman Sea. The study will be helpful for the new researchers, Biologist, entrepreneurs as well as Aquaculturist for further research, breeding and collection of the fishes from the mentioned sites.

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