

Current Knowledge on Lionfish and Monitoring in Turkey

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**How many lionfish species?
Are there cryptic invaders?**

The Occurrence, Extention and Distribution of Lionfish in Turkish Marine Waters

- A single specimen of *Pterois miles* was first captured in Iskenderun Bay in 2014 (Turan *et al.* 2014)
- A single specimen of red lionfish *Pterois volitans* was recorded for the first time in 2016 from the Iskenderun Bay (Gürlek *et al.* 2016)
- This was the first record of the red lionfish *P. volitans* along the Mediterranean Sea



Pterois miles first occurrence and current distribution



***Pterois volitans* first occurrence and current distribution**

Gökoglu et. al., (2017)

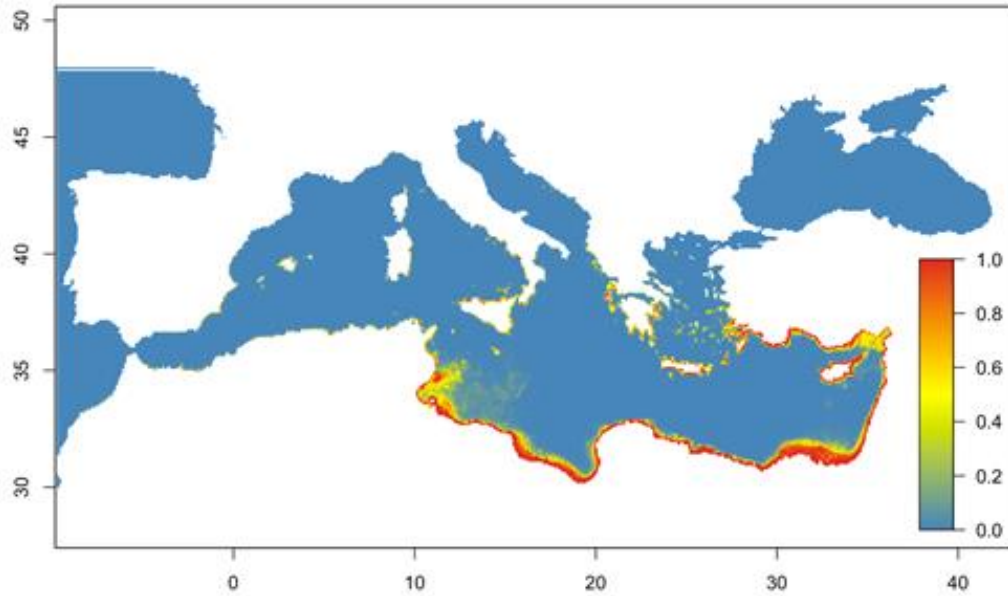
Gökoglu et. al., (2017)

Gürlek et. al., (2016)

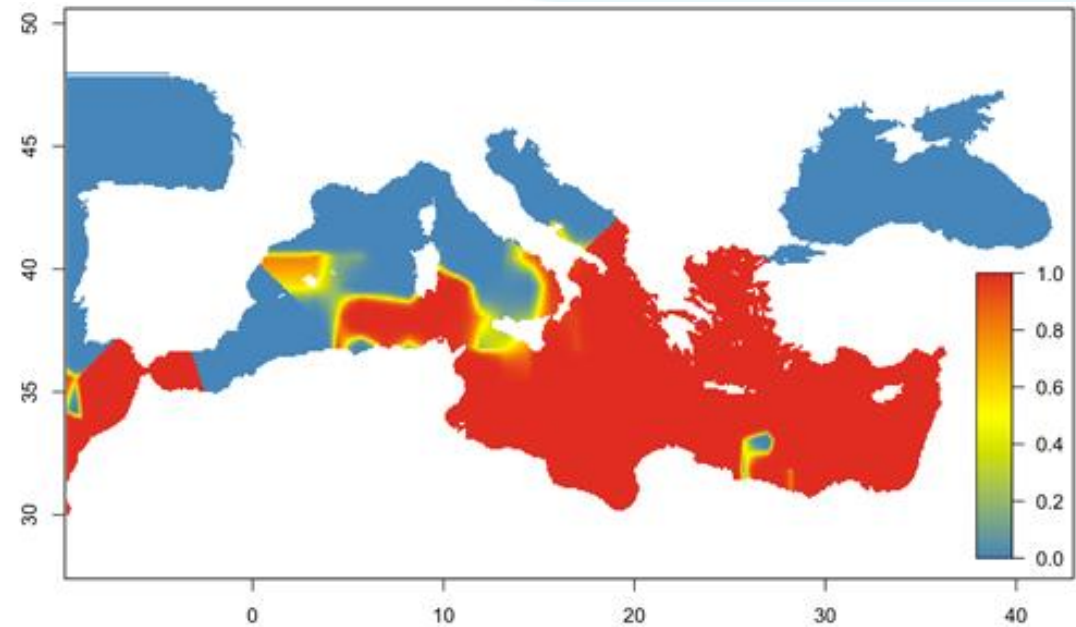
Ayas et. al., (2018)



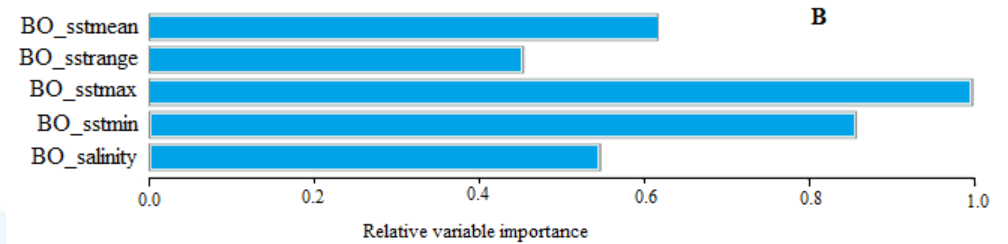
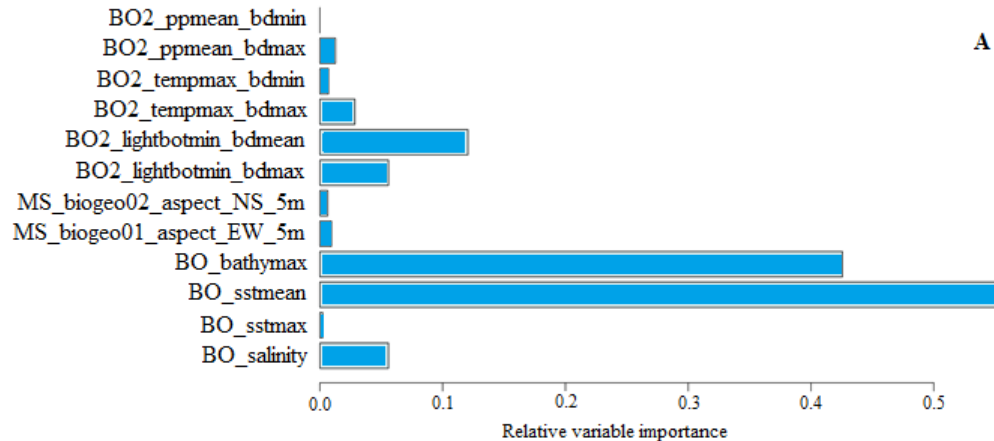
Modelled current and future distribution of *P. miles* in the Mediterranean



Predicted current distribution of *P. miles* in the Mediterranean based on Maxlike model. Scale bar show the probability of richness

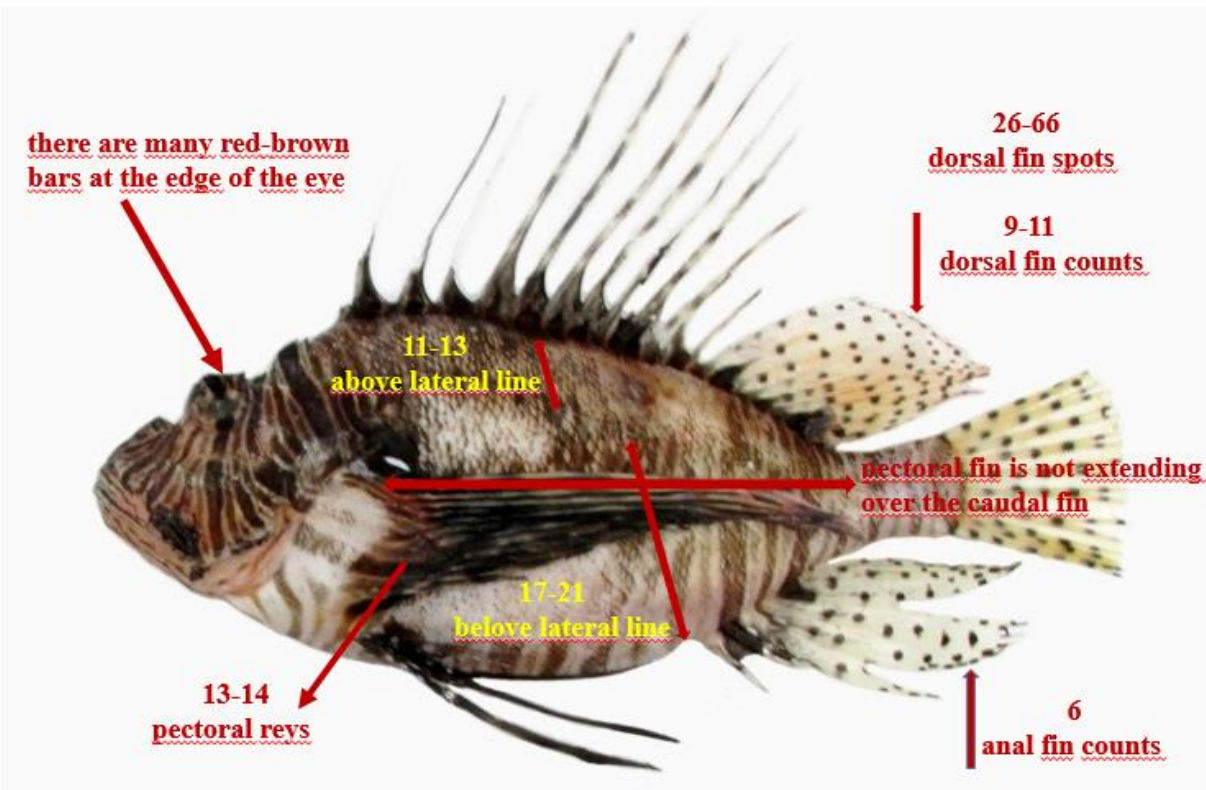


Predicted future distribution of *P. miles* in the Mediterranean by 2100 under the IPCC climate change scenario A1B.

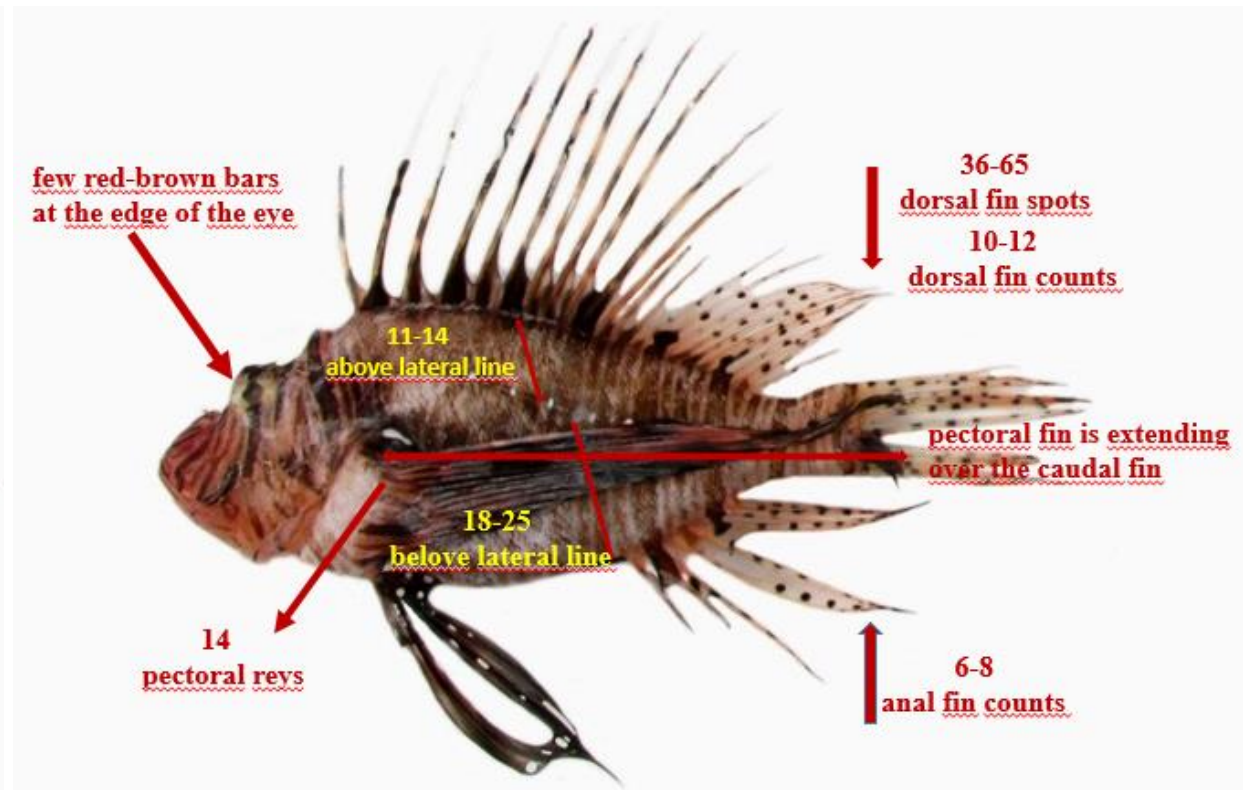


Morphologically Differentiated Characters between *P. miles* and *P. volitanse*

Pterois miles



Pterois volitanse



Turan, C., Ergüden, D., Gürlek, M., Yağhoğlu, D., Uyan, A., & Uygur, N. (2014). First record of the Indo-Pacific lionfish *Pterois miles* (Bennett, 1828)(Osteichthyes: Scorpaenidae) for the Turkish marine waters. *Journal of Black Sea/Mediterranean Environment*, 20(2), 158-163.

Gürlek, M., Ergüden, D., Uyan, A., Doğdu, S. A., Yağhoğlu, D., Öztürk, B., & Turan, C. (2016). First record red lionfish *Pterois volitans* (Linnaeus, 1785) in the Mediterranean Sea. *Natural and Engineering Sciences*, 1(3), 27-32.

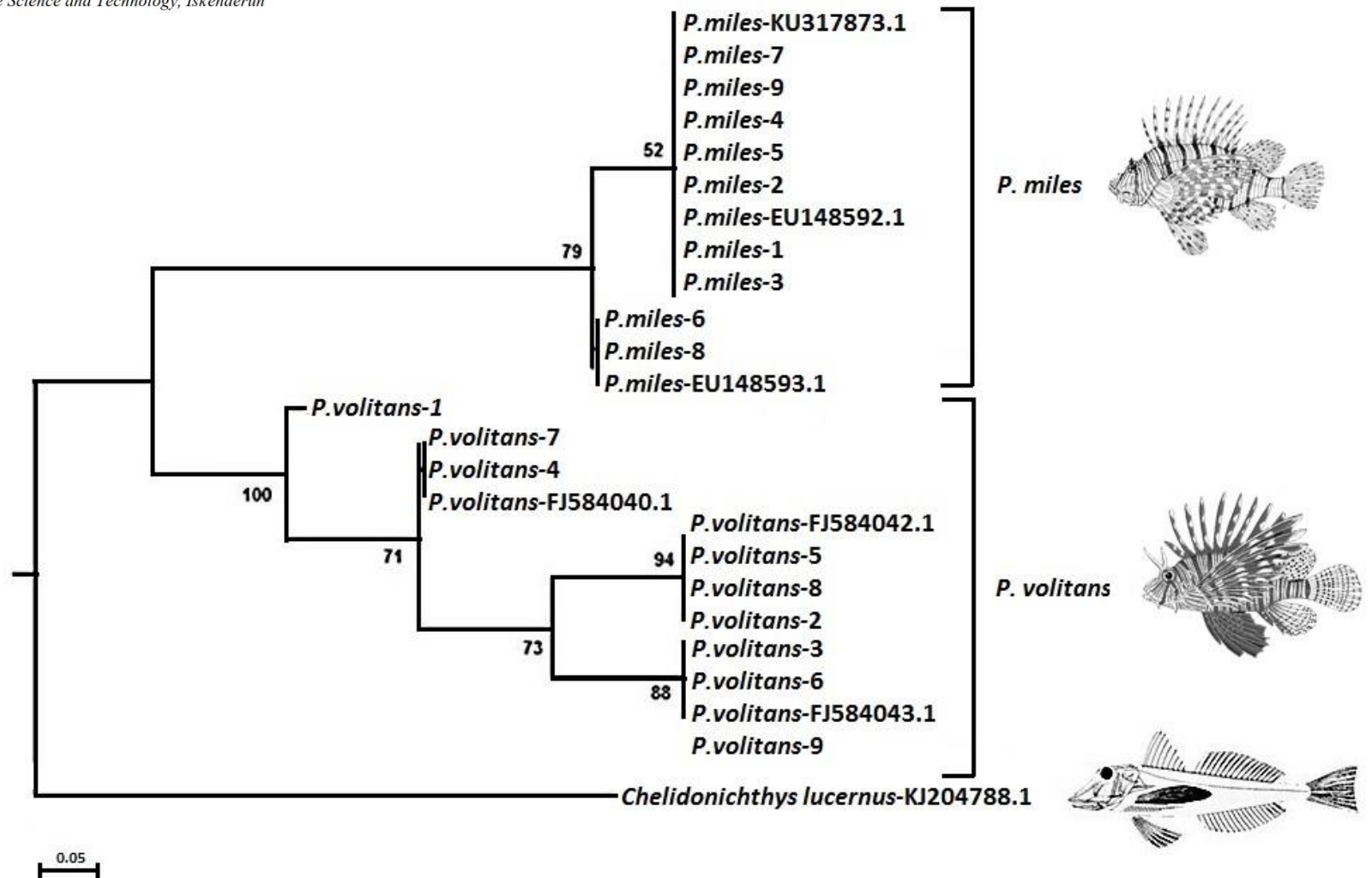
DNA barcodes for identifications of two lionfish species *Pterois miles* (Bennett, 1828) and *P. volitans* (Linnaeus, 1758) in the Mediterranean

Cemal TURAN*, Ali UYAN, Mevlüt GÜRLEK, Servet Ahmet DOĞDU
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GenBank Sequences
P.miles - KU317873.1 from Rabaoui et al. (2019), and EU148592.1, EU148593.1 from Lakra et al (2009)
P.volitans-FJ584040.1, FJ584042.1, FJ584043.1 from Steinke et al. (2009)

Neighbor Joining Tree



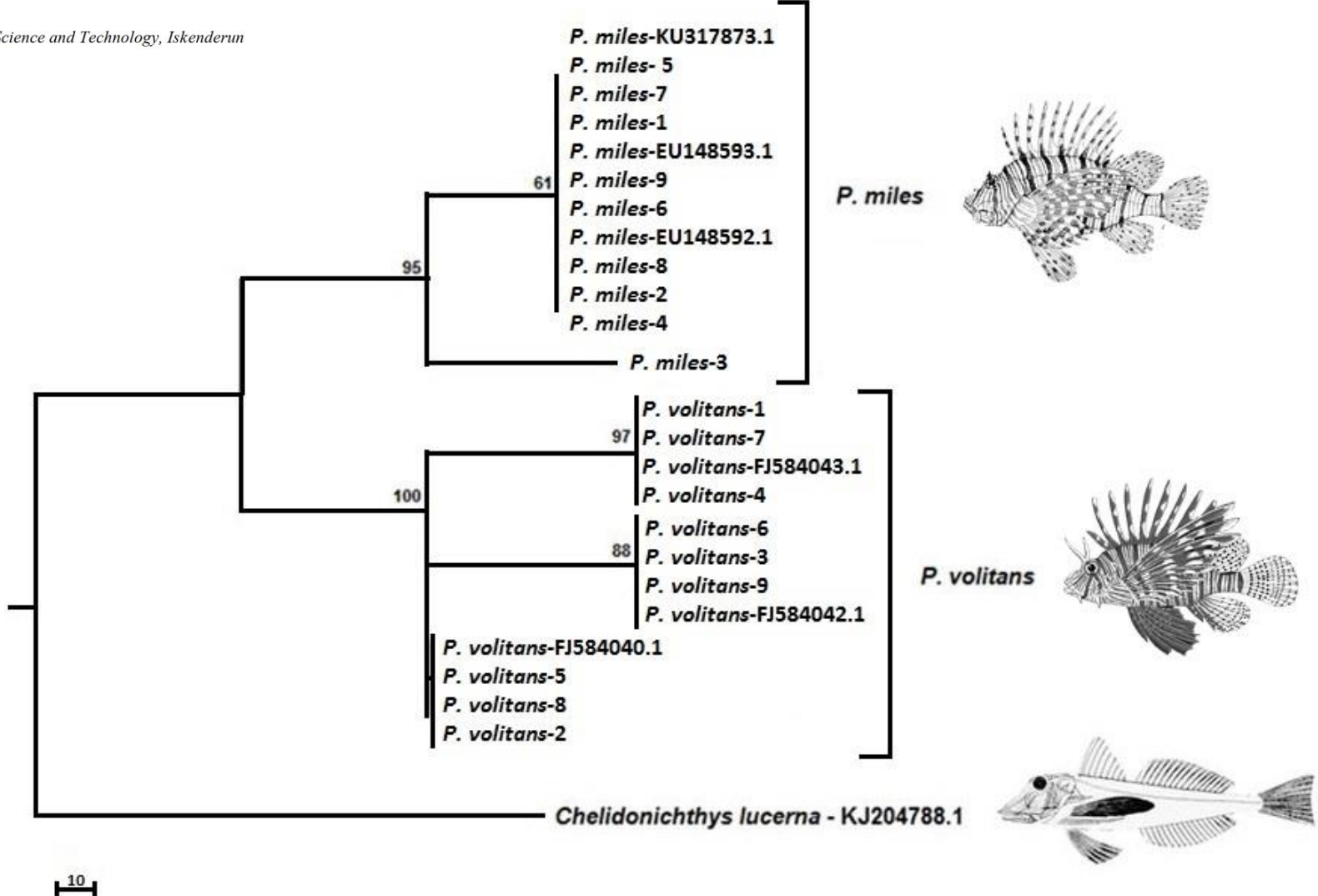
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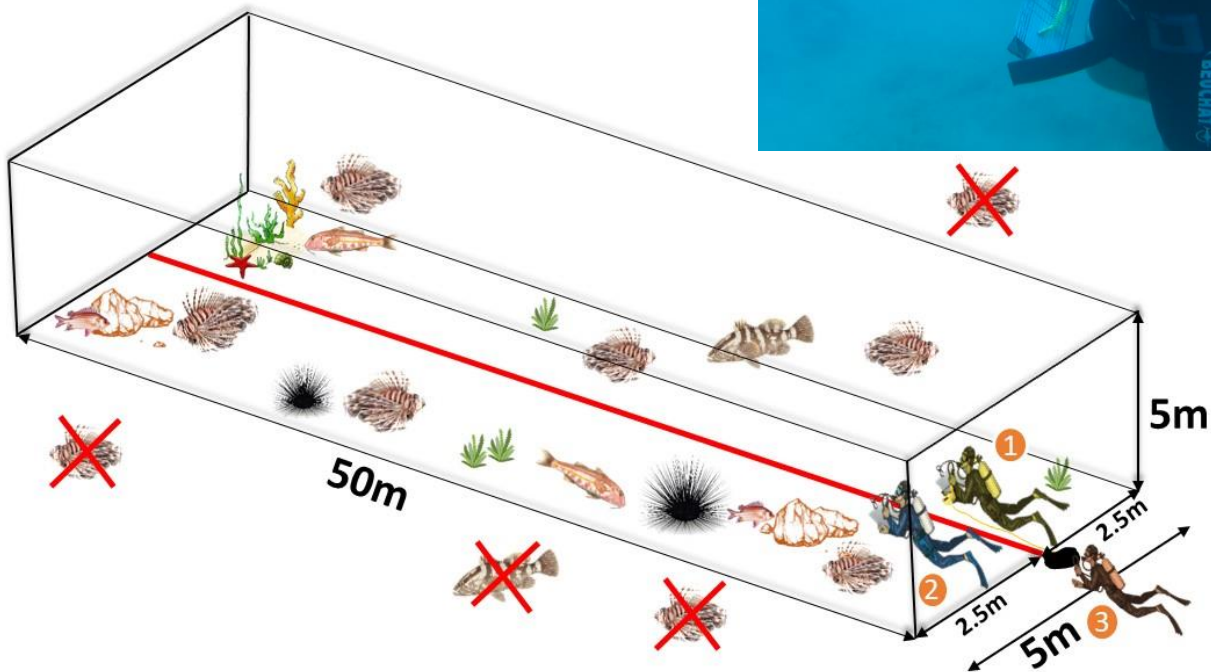
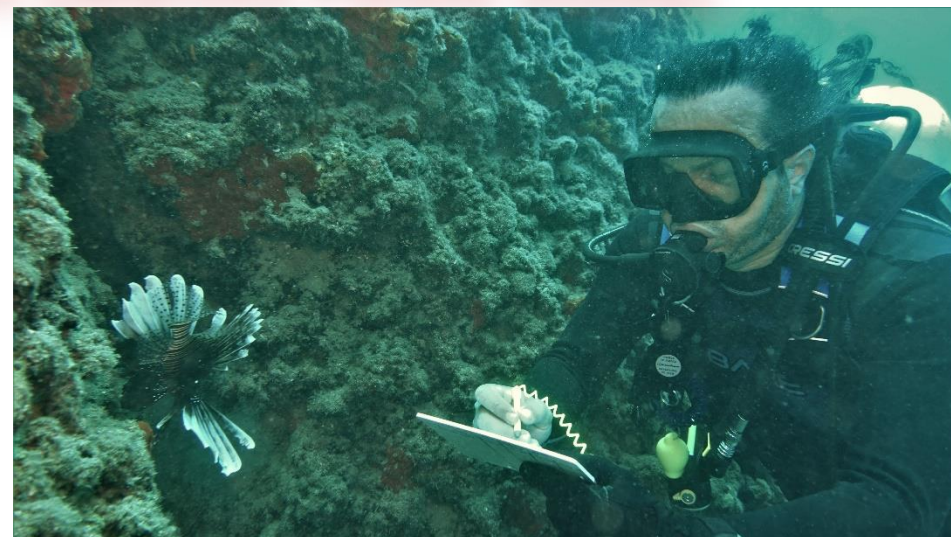


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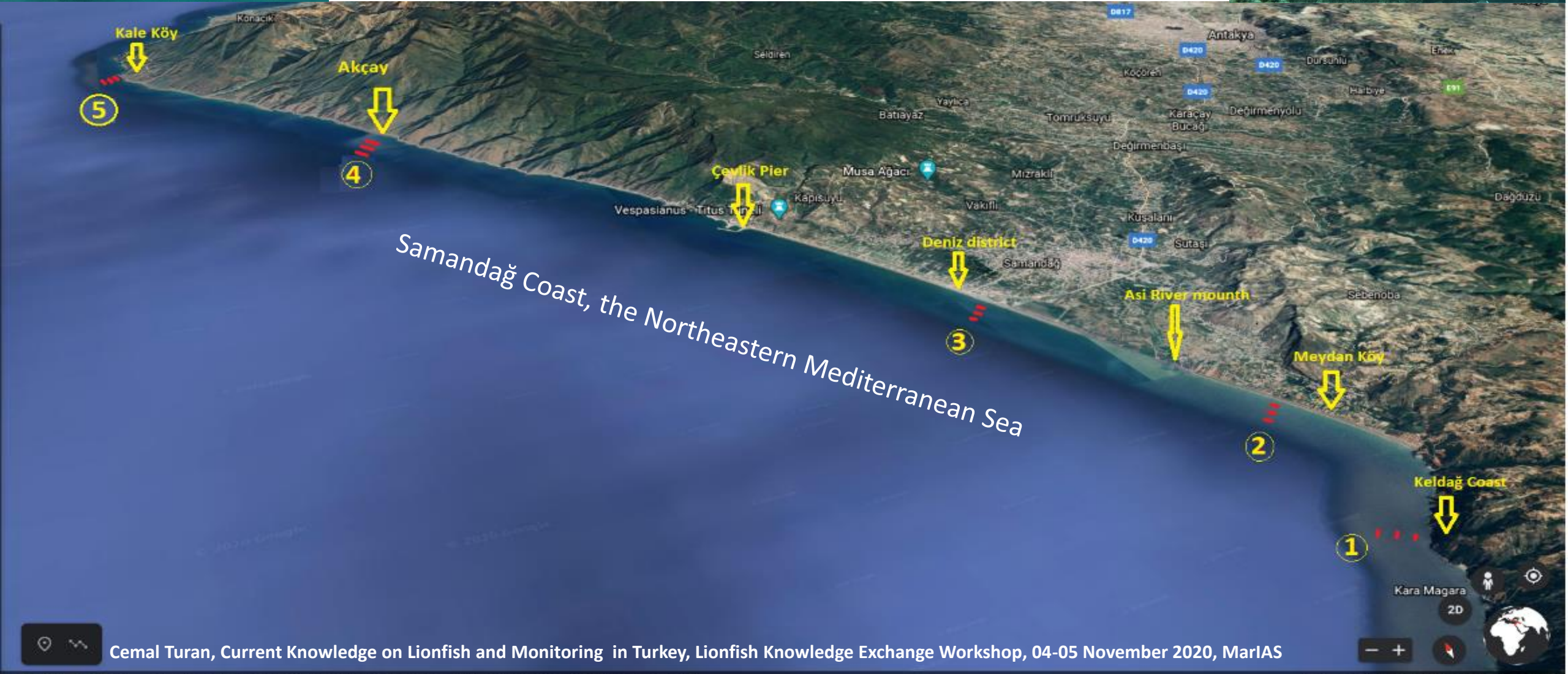
Maximum Parsimony Tree



Underwater Visual Census Method for Population Density, Abundance and Distribution Analysis of Lionfish (MarIAS Field Study)



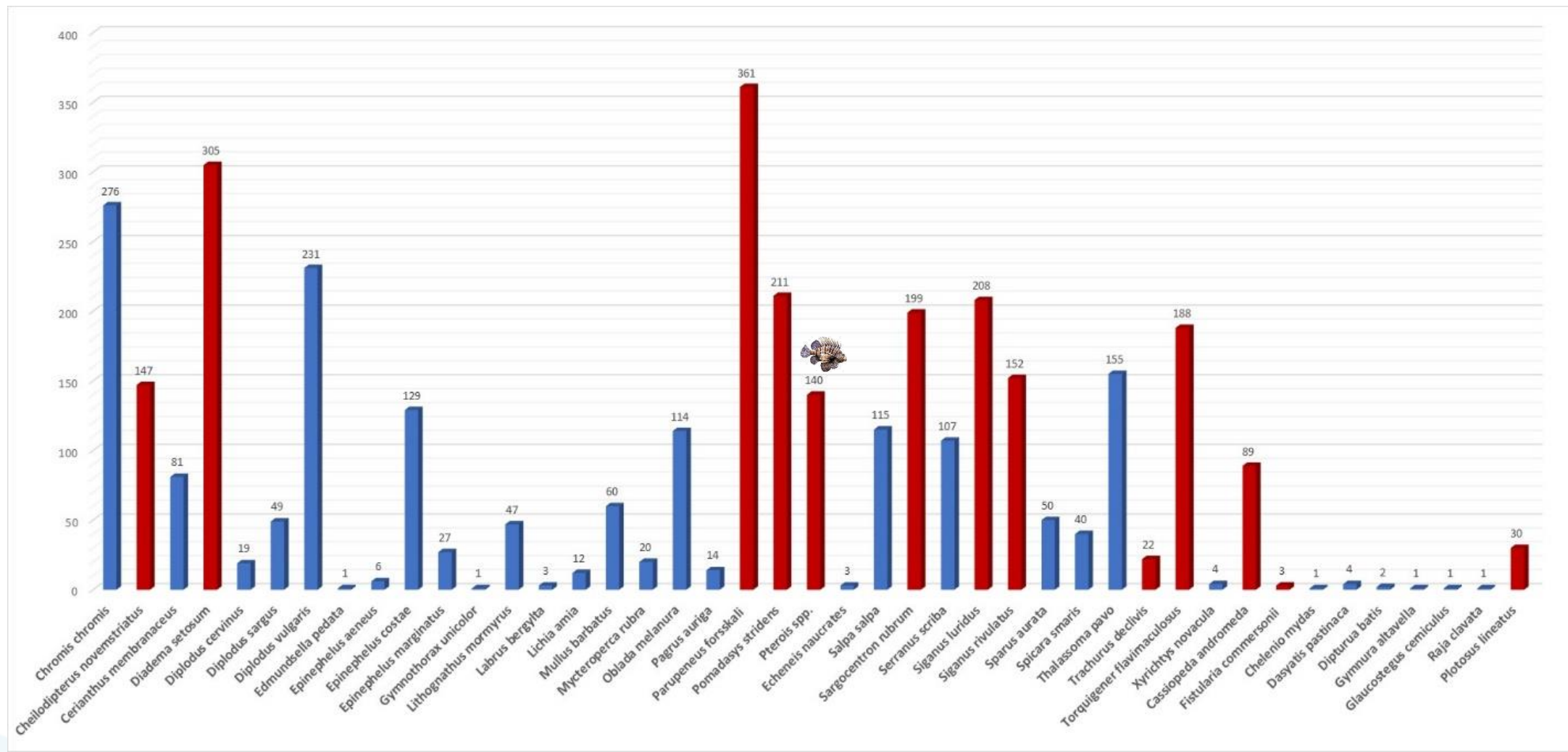
Map of monitoring locations and transects for underwater visual census study



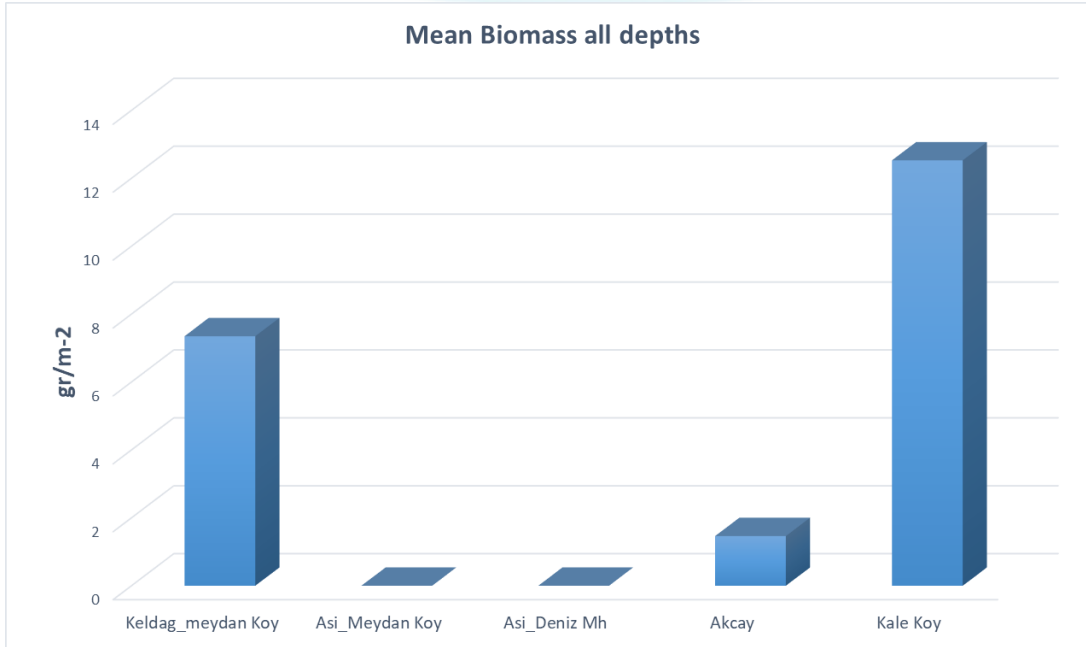
Cemal Turan, Current Knowledge on Lionfish and Monitoring in Turkey, Lionfish Knowledge Exchange Workshop, 04-05 November 2020, MarIAS



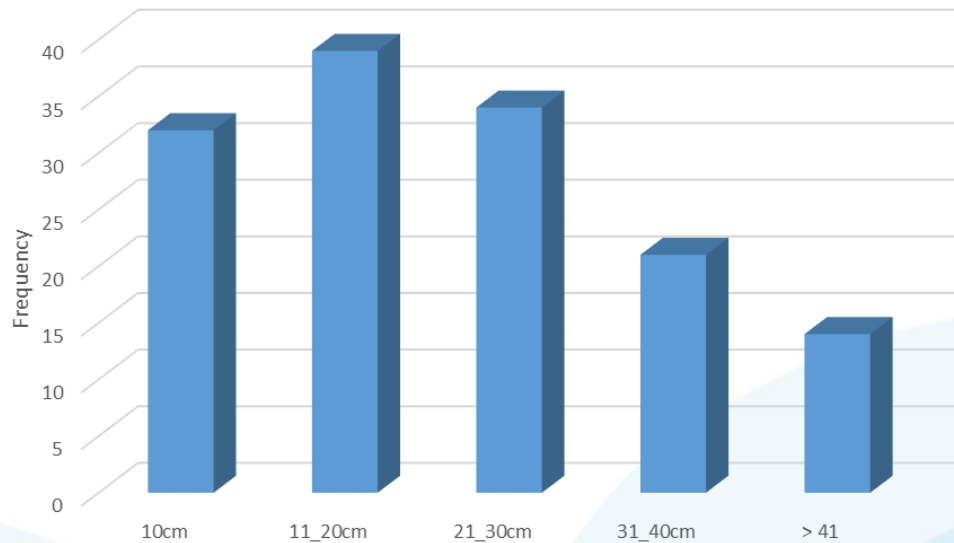
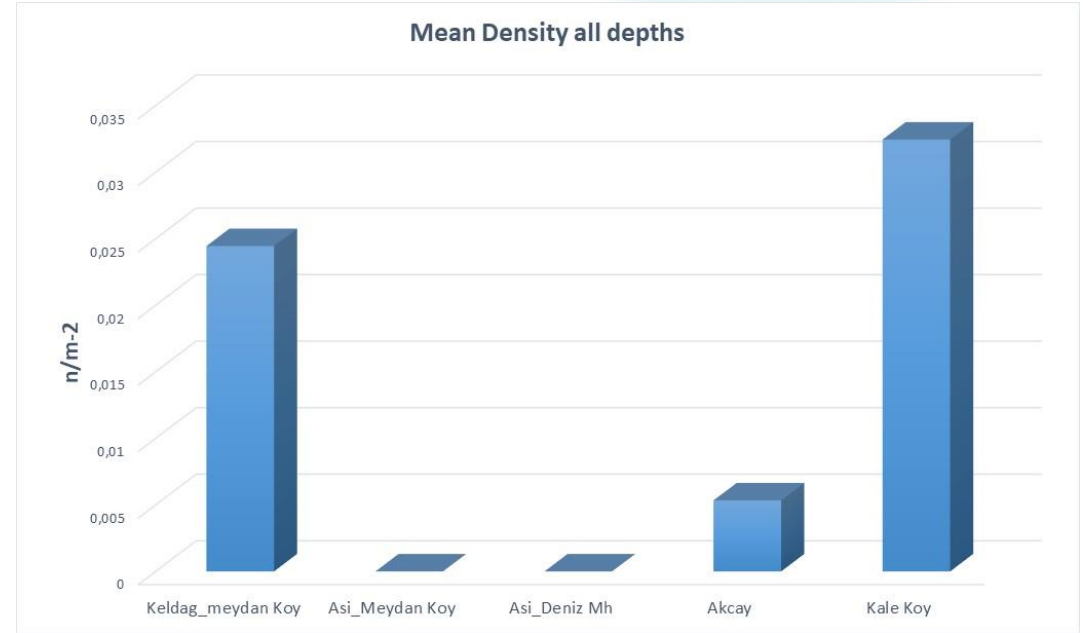
➤ Frequency of all monitored species at all study regions with underwater visual census study. IAS are colored with red



Monitored biomass (gr/m²) of lionfish comprising all transect and depths for each study regions.



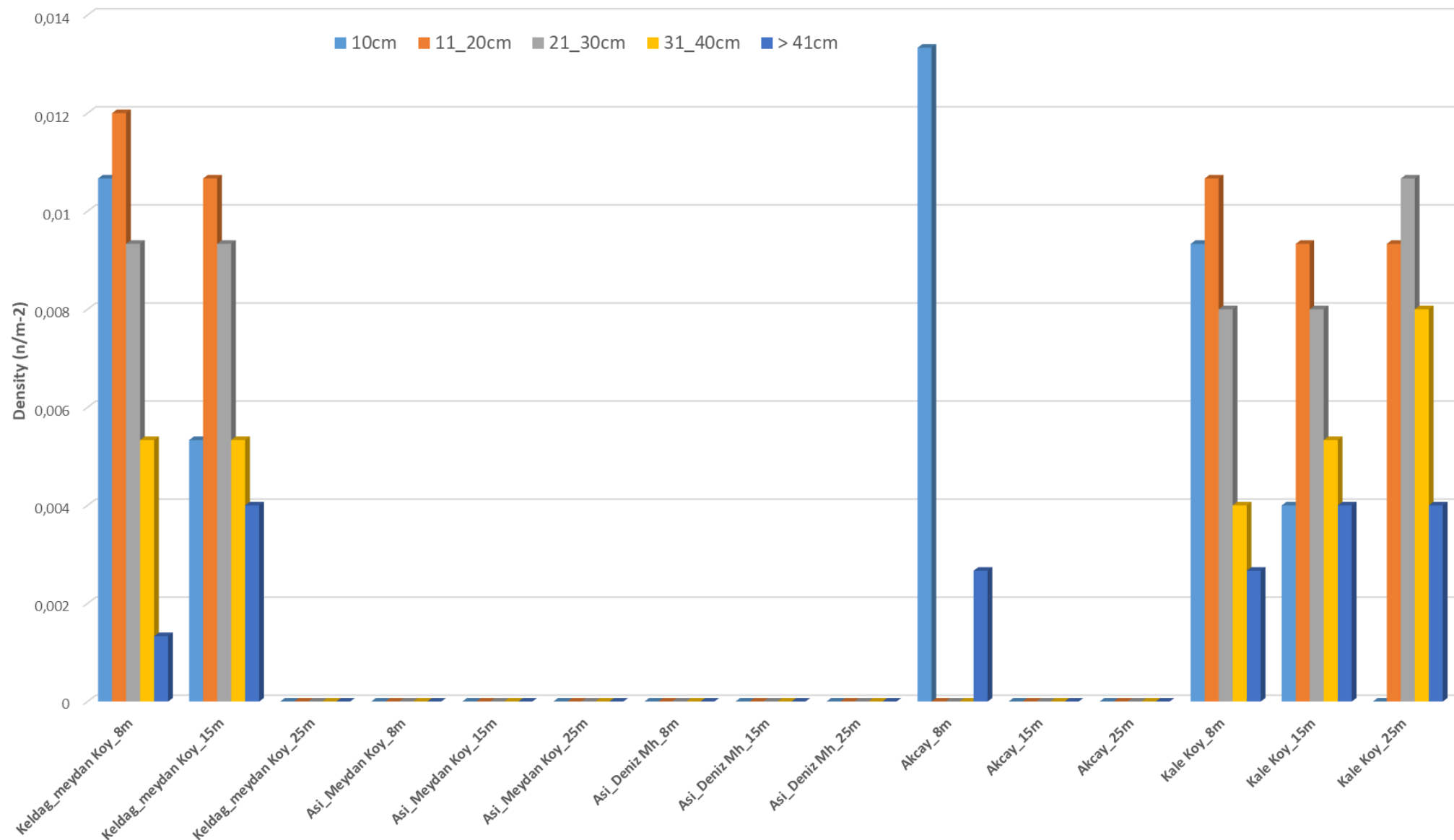
Monitored density of lionfish (n/m²) comprising all transect and depths for each study regions.



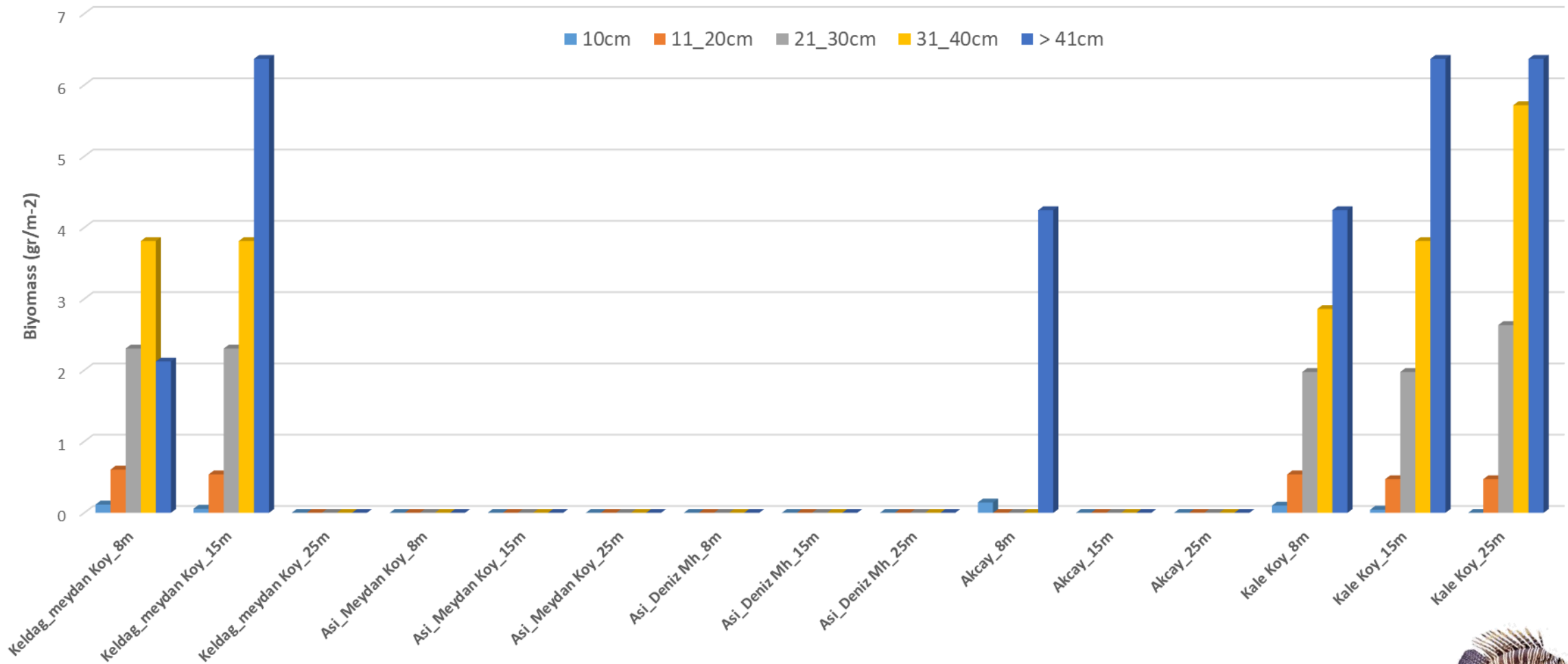
Distribution of the all size classes of lionfish, comprising all monitored transects, depths and sites.



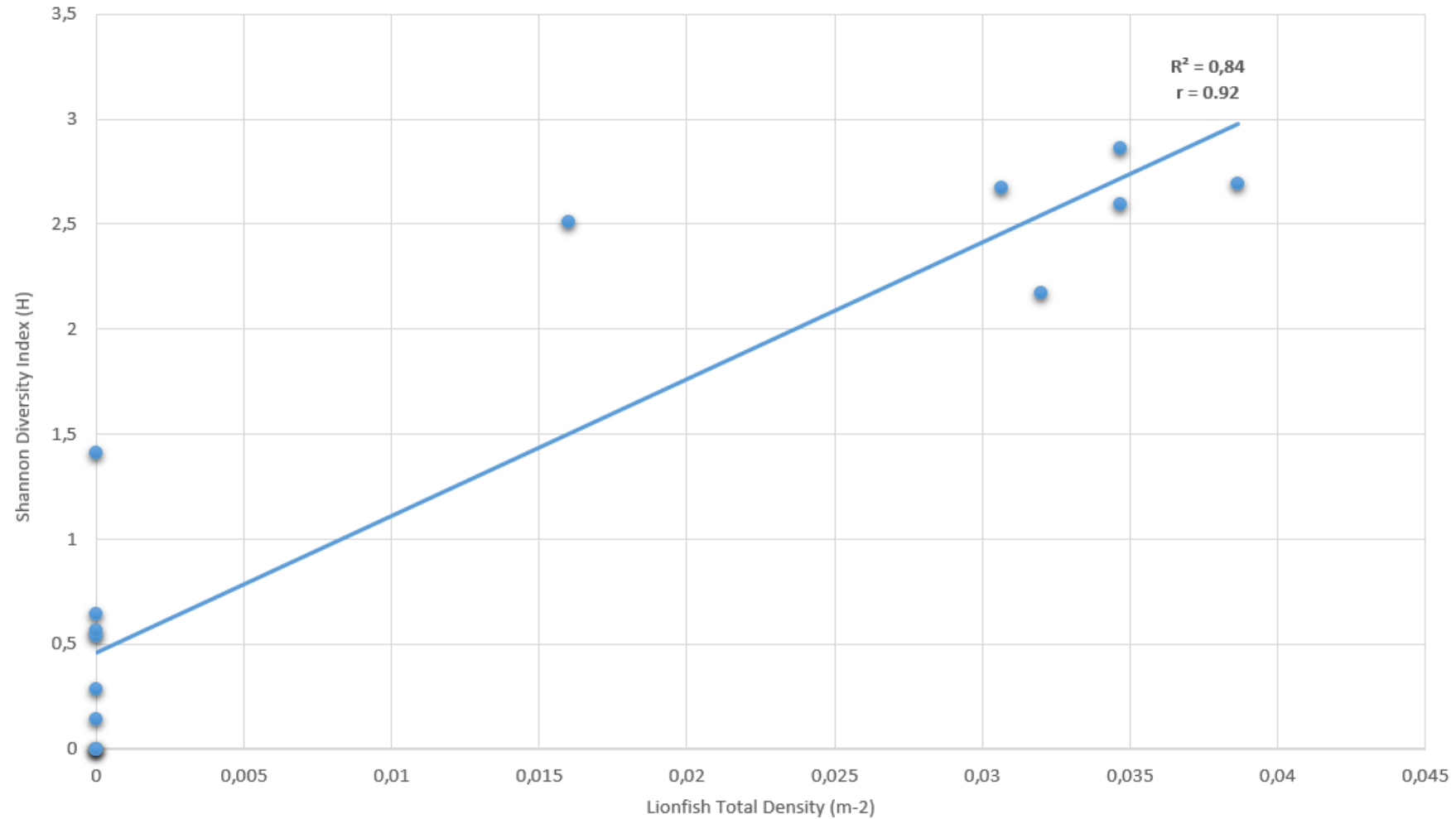
The monitored density of lionfish (n/m^2) for each depth at each study region.



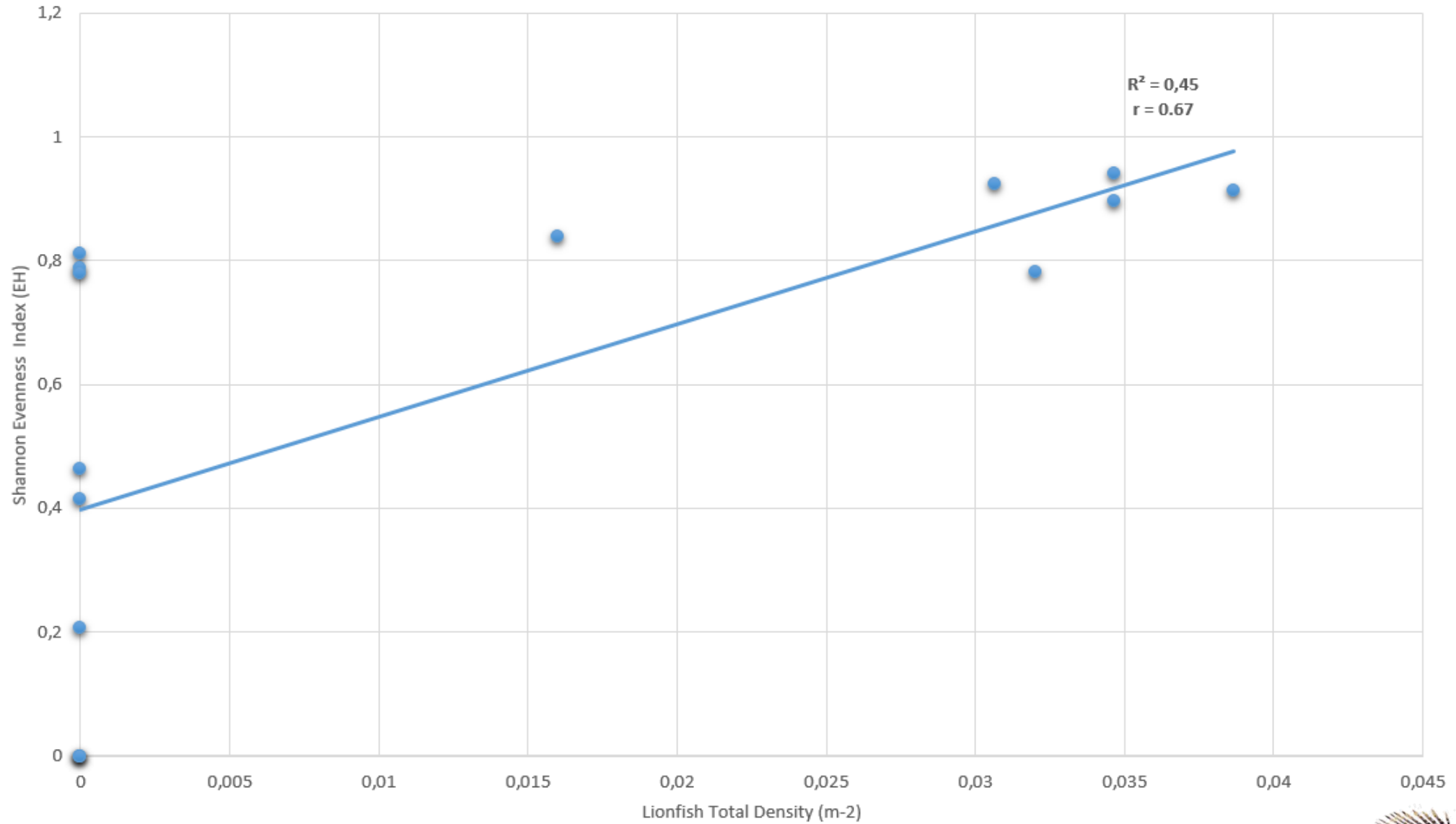
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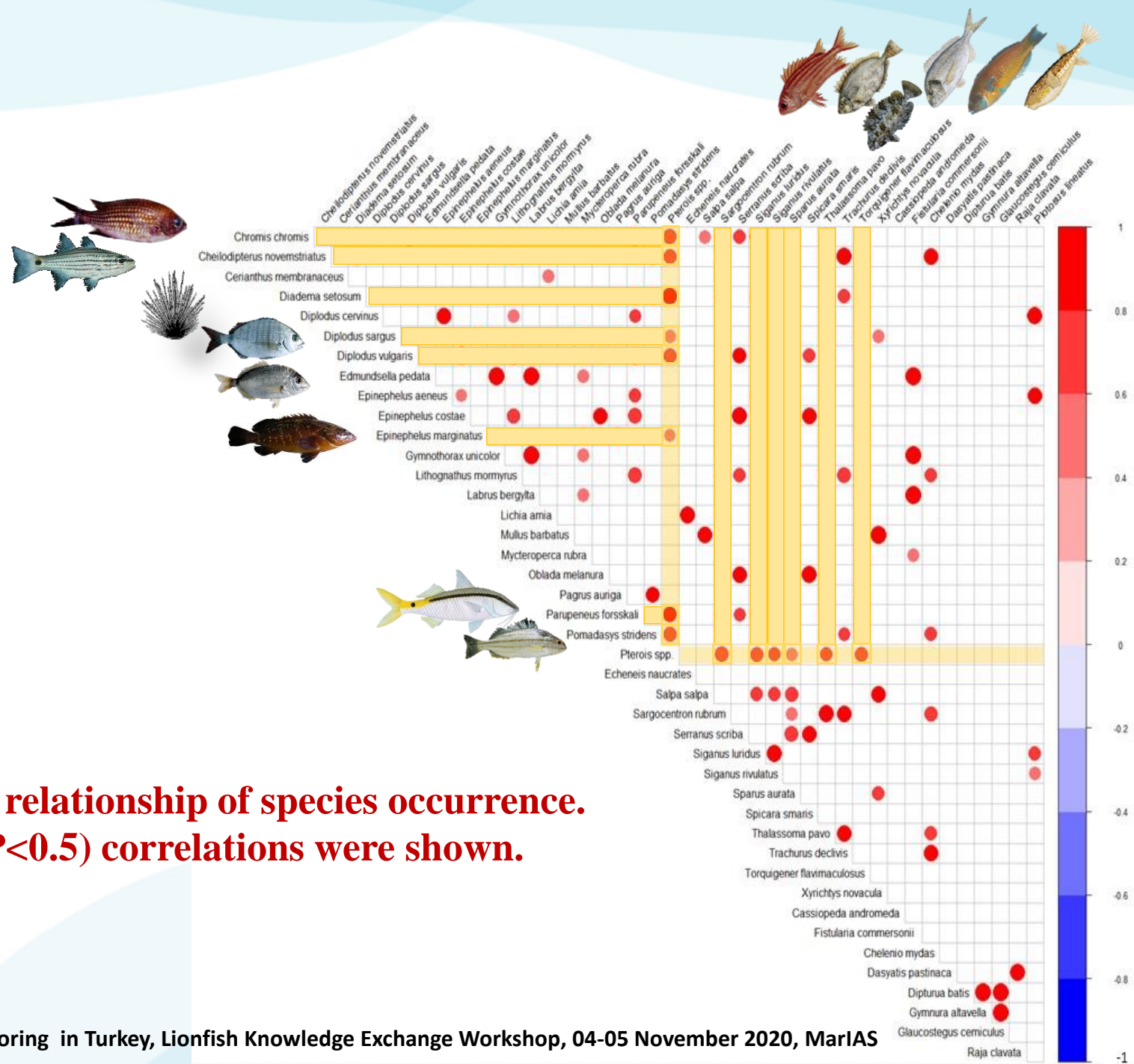
Correlation between Lionfish Total Density (m²) and Shannon Diversity Index (H)



Correlation between Lionfish Total Density (m²) and Shannon Evenness index (E_H)



**Pearson correlations, showing relationship of species occurrence.
Only statistically significant ($P < 0.5$) correlations were shown.**



Principal Component Analysis

