“Analysis of fish bycatch from the commercial shrimp fleet in the South East Gulf of California”

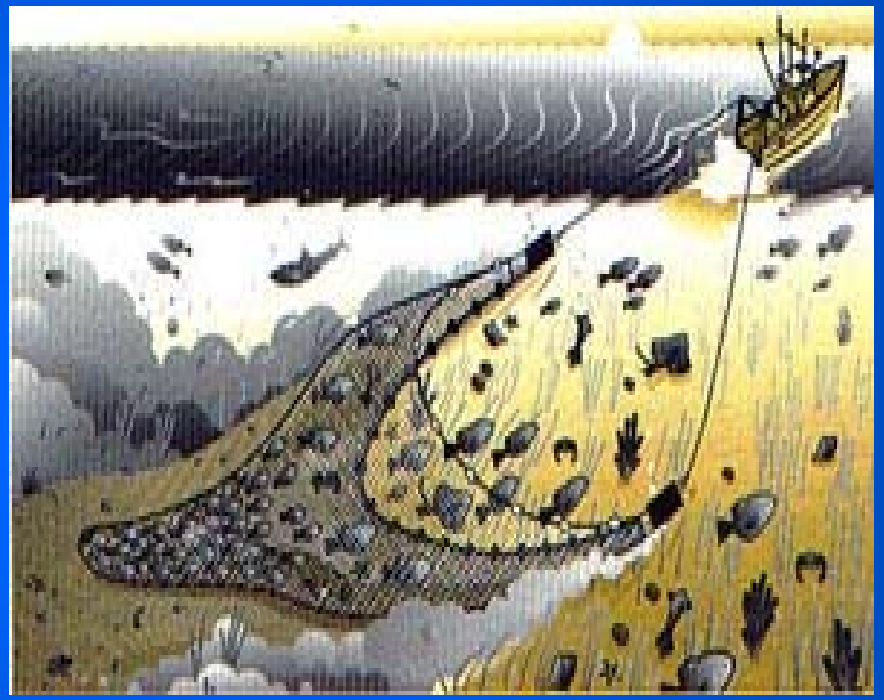
B.P Iván Martínez T., Dr. Felipe Amezcua M., Dr. Juan Madrid V.

Instituto de Ciencias del Mar y Limnología, UNAM

Unidad Mazatlán

Centro Regional de Investigación Pesquera Mazatlán

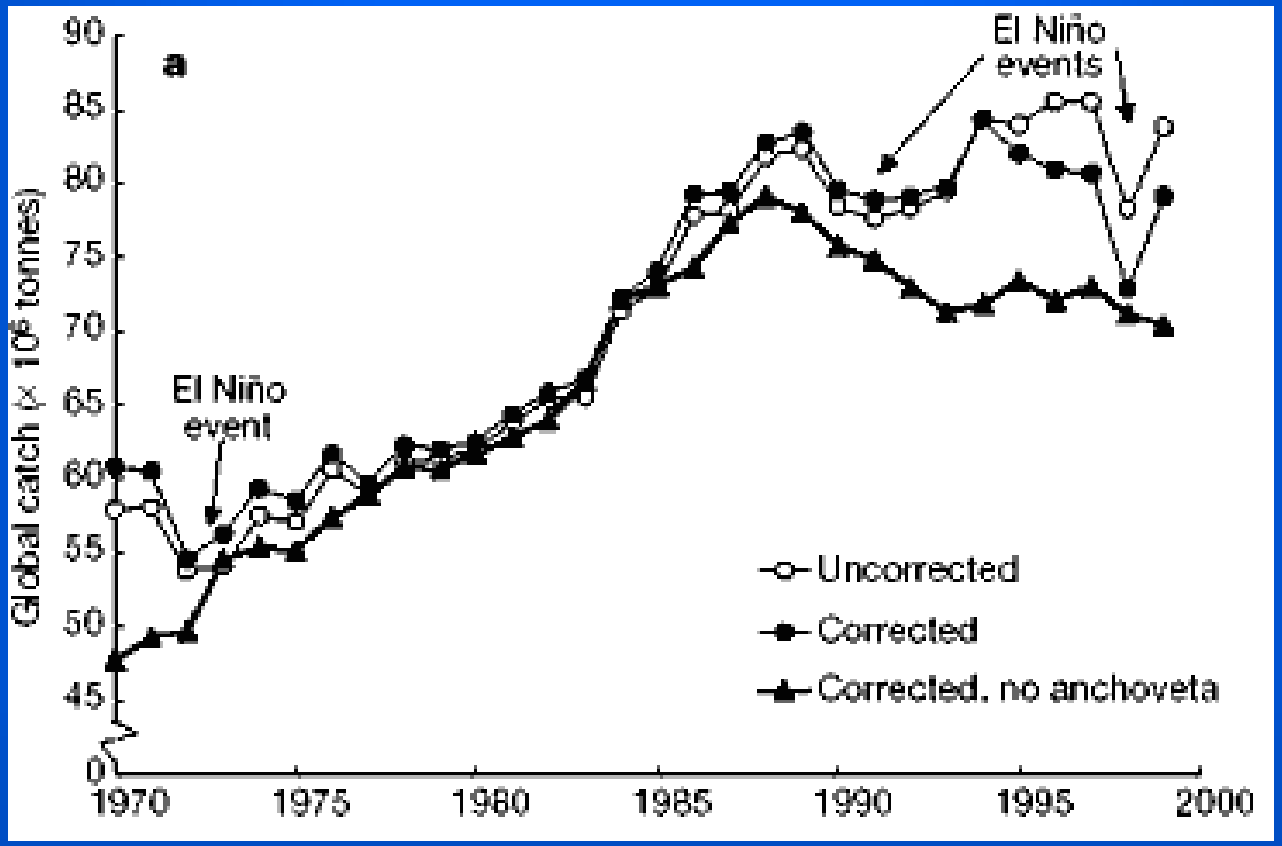
Although shrimp fisheries are of great economic importance worldwide, they produce serious ecological disturbances and affect other resource harvesting activities such as small-scale fisheries.



Although shrimp trawl fisheries provide social and economic benefits, several other aspects need to be considered in their evaluation.

Some 9.5 million tons of bycatch are taken annually in shrimp trawl fisheries worldwide, representing 35% of the incidental catch by all commercial fisheries

A characteristic is its high variability in space and time.
Changes in the abundance and the composition of the diversity happen frequently in the fish communities of co ocurrent areas.



Objectives

To describe the composition, distribution and abundance of the bycatch icthyo fauna in the Sinaloa area from the commercial shrimp fleet in the South East Gulf of California.

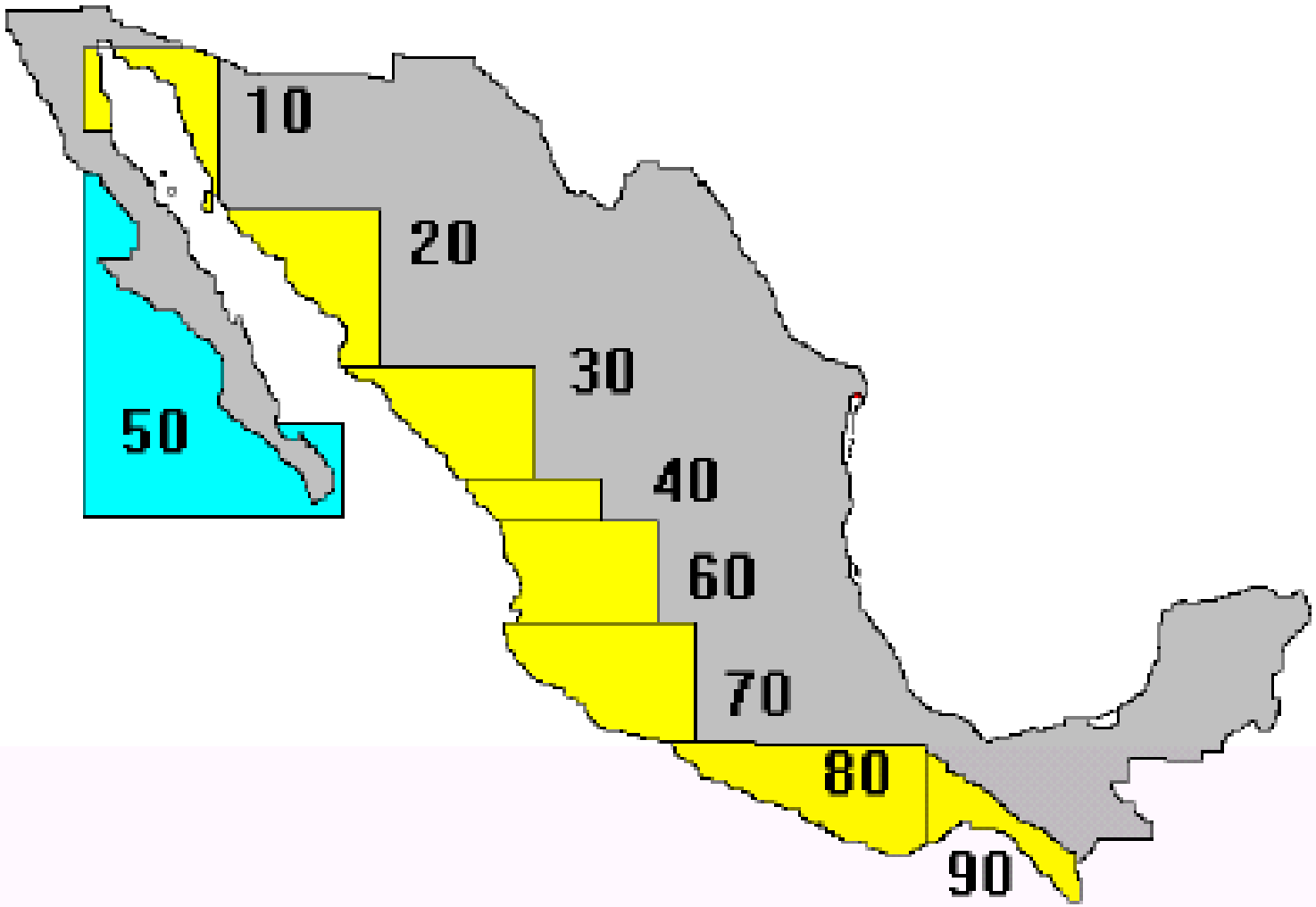
To determine the spacial abundance and biomass of the ichthyic species.

To describe the temporal variations within areas of the species that conform the community os fishes at this area using the ecological models as richness, diversity and equitability.

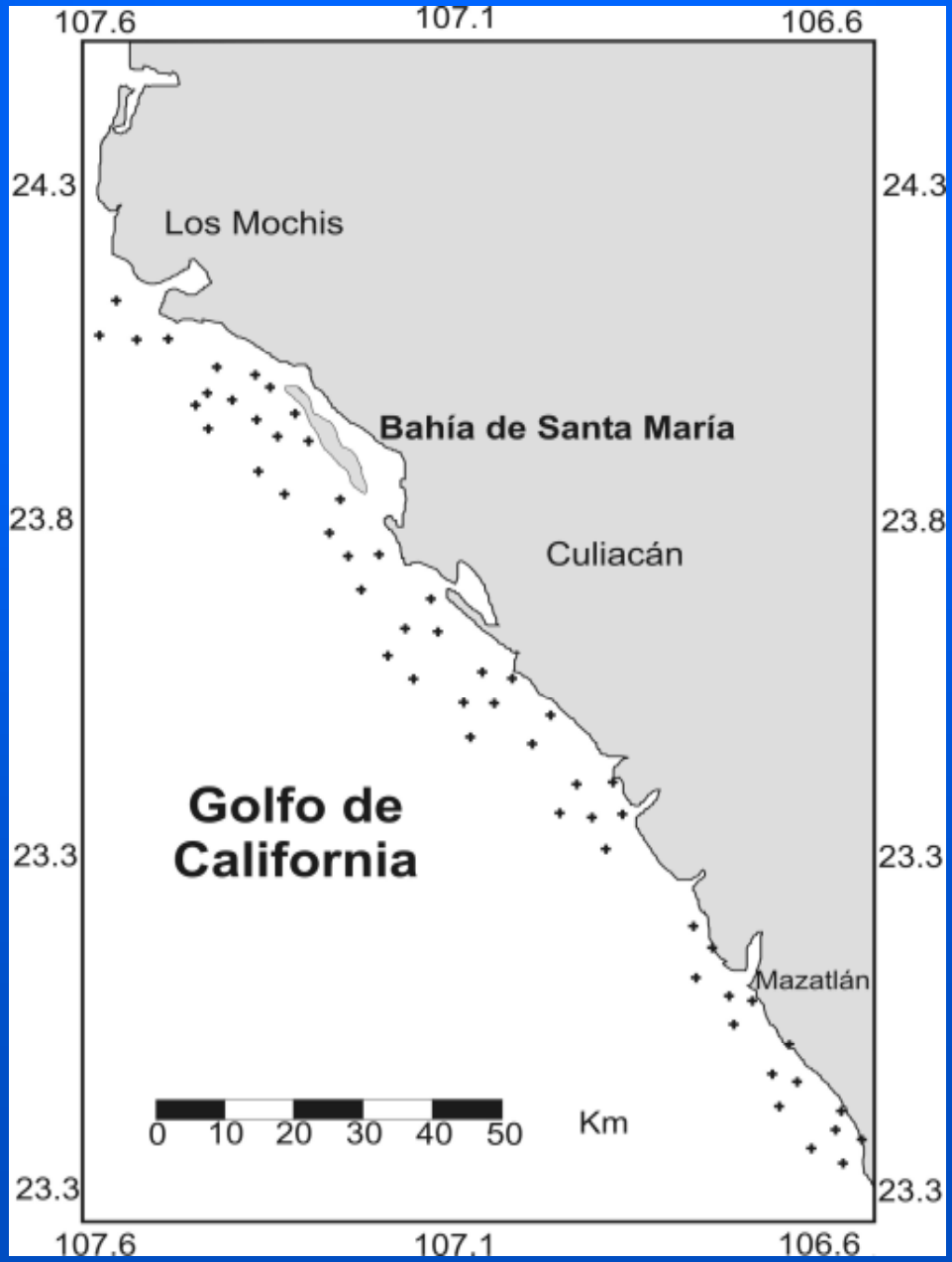
To determine the dominate species of the ichthyic fauna in Sinaloa, in terms of numeric abundance.

Materials and Methods

Cruises of boats were carried out aboard shrimp fishers who are facilitated in agreement with the Regional Center of Fishing Investigation (CRIP); they were operating in part of the Annual Shrimp distributions of shrimp throughout the coast of Sinaloa, in the platform of the Mexican Pacific from 25º 40´ N, 109º 30´ W to 21º 54´ N, 106º 03´ W (Figure 1).


10
20
30
40
50
60
70
80
90

Studied Area



The cruises were carried out in commercial boats with shrimp trawling nets of 80 and 120 feet of length, and line of 30 mm in the cod end.

At the laboratory, the organisms were identified, measured (total length), and weighed in a digital balance.

These data, together with locality, depth, salinity and temperature were used to calculate the different indices.

Abundance and relative weight:

%N=(N/TN) * 100

%W=(W/TW) * 100

Pielou Equitability Index :

$$H? \; H\text{큻ax} = H? \ln S = J$$

Diversity and Richness

Margalef Richness:

$$DMg = (S-1) / \ln N$$

Shannon index :

$$H' = -\sum (pi)(\log pi)$$

Simpson index:

$$D = 1 - \sum (pi)\text{^}_2$$

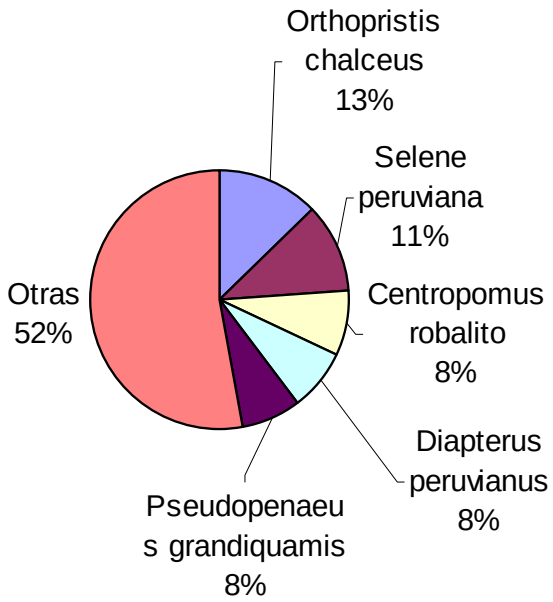
RESULTS

219 species from 52 families were identified.

Specie	Relative weigth
Synodus scituliceps	6.6335
Pomadasys panamensis	6.2703
Centropomus robalito	6.2104
Diapterus peruvianus	4.4688
Pseudopenaeus grandiquamis	3.6769
Cyclopsetta querna	2.7730
Urotrygon chilensis	2.7409
Larimus effulgens	2.5292
Orthopristis chalceus	2.4774
Selene peruviana	2.1710
Larimus pacificus	2.1201
Eucinostomus currani	2.0276
Polydactylus approximans	1.9956
Eucinostomus entomelas	1.9122
Chloroscombrus orqueta	1.8105

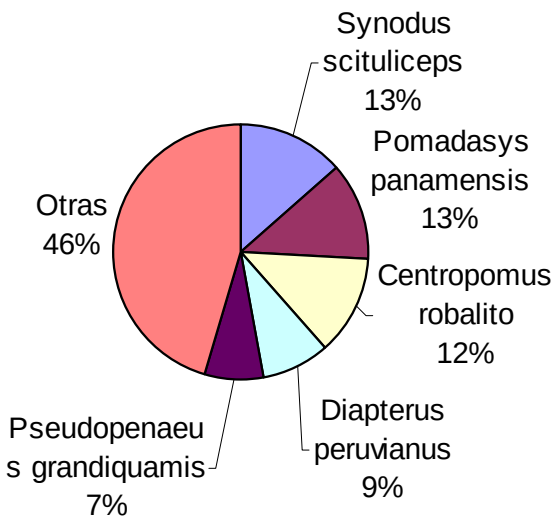
Specie	Relative abundance
Orthopristis chalceus	6.293353
Selene peruviana	5.484104
Centropomus robalito	4.031792
Diapterus peruvianus	3.843931
Pseudopenaeus grandiquamis	3.728324
Pomadasys panamensis	3.706647
Chloroscombrus orqueta	3.677746
Synodus scituliceps	3.280347
Syacium ovale	2.500000
Prionotus xenisma	2.449422
Eucinostomus currani	2.326590
Cyclopsetta querna	2.210983
Larimus effulgens	2.153179
Etropus crossotus	2.044798
Diplectrum pacificum	1.849711

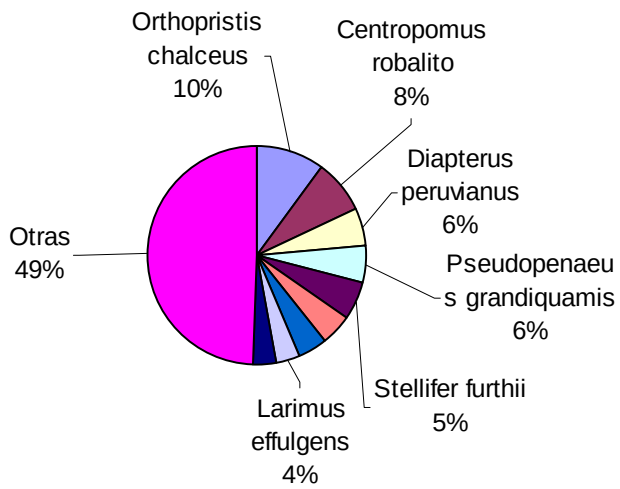
Abundance and relative weigth of the most common species during the 3 years of samplings



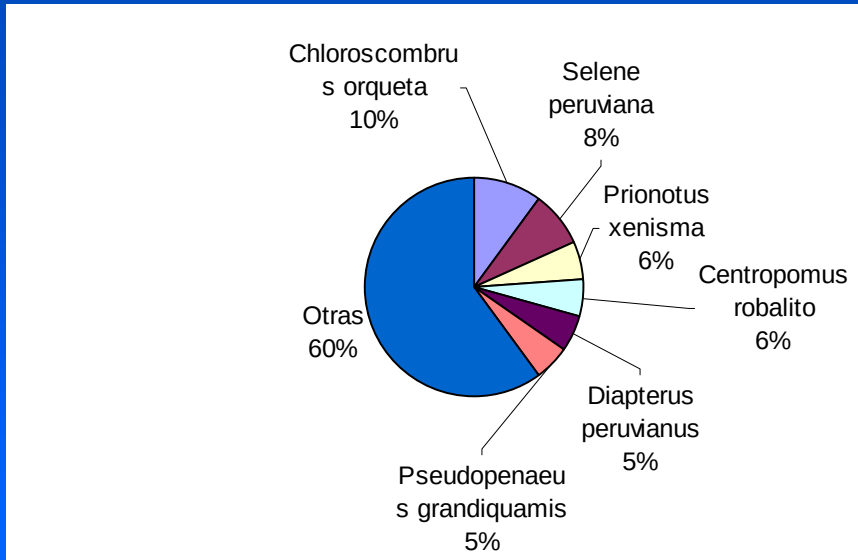
Relative abundance

Relative weight

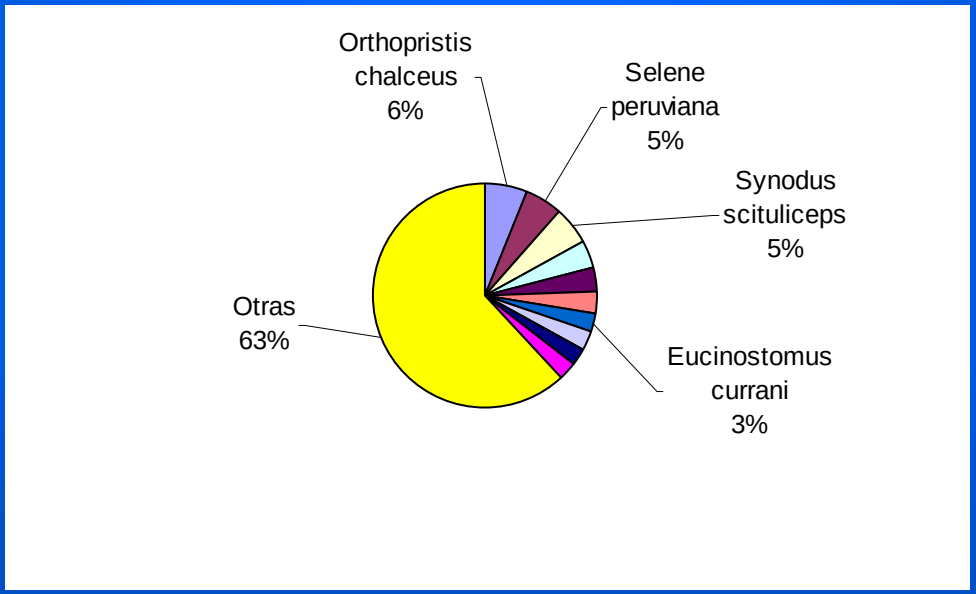




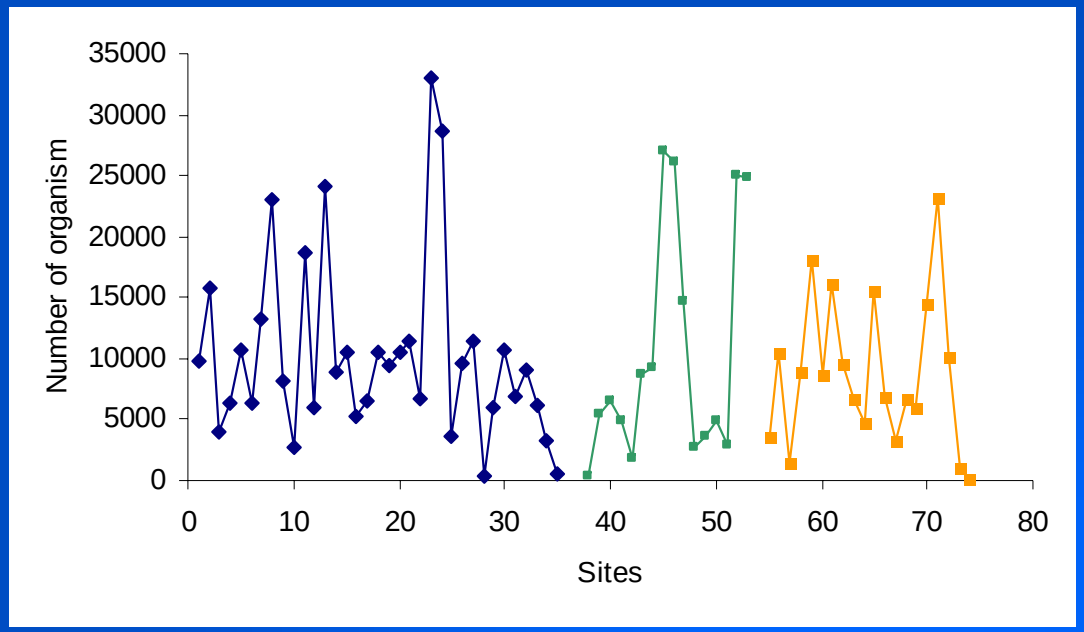
Zone 60



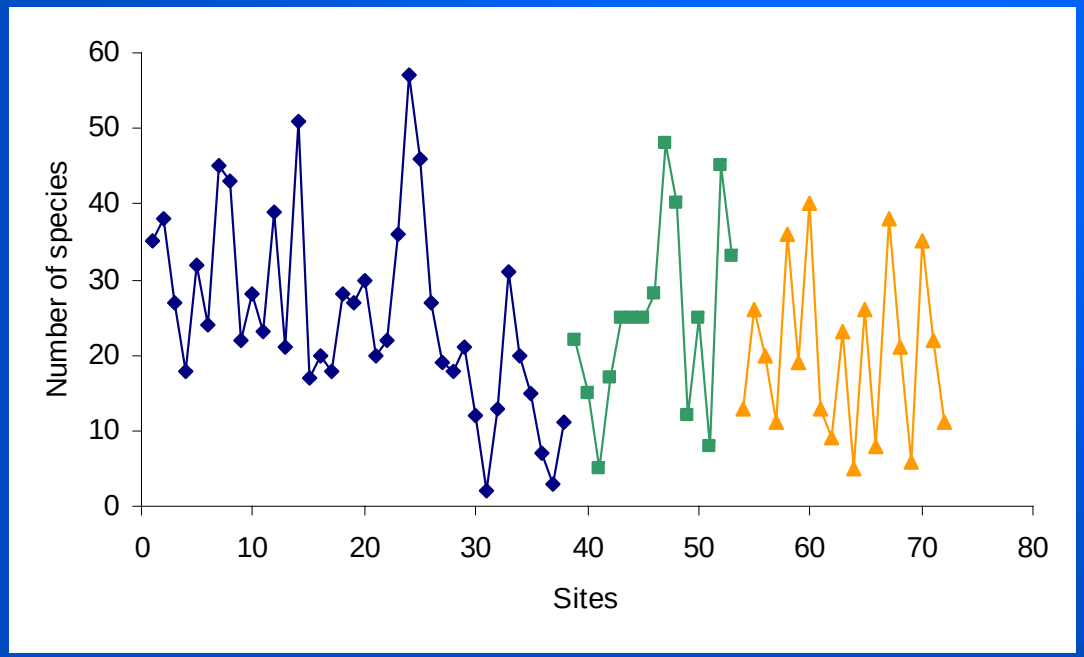
Zone 40



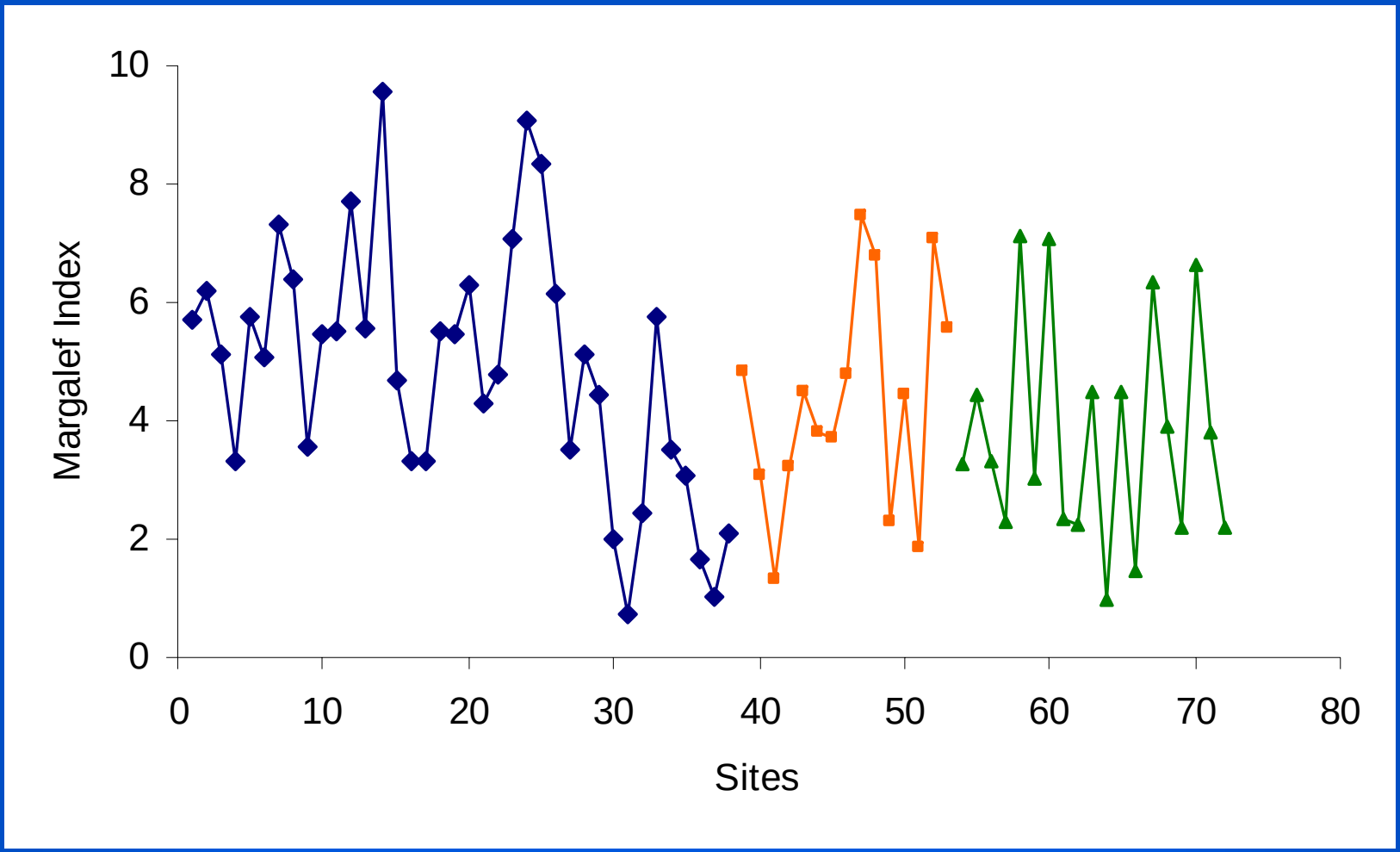
Zone 30



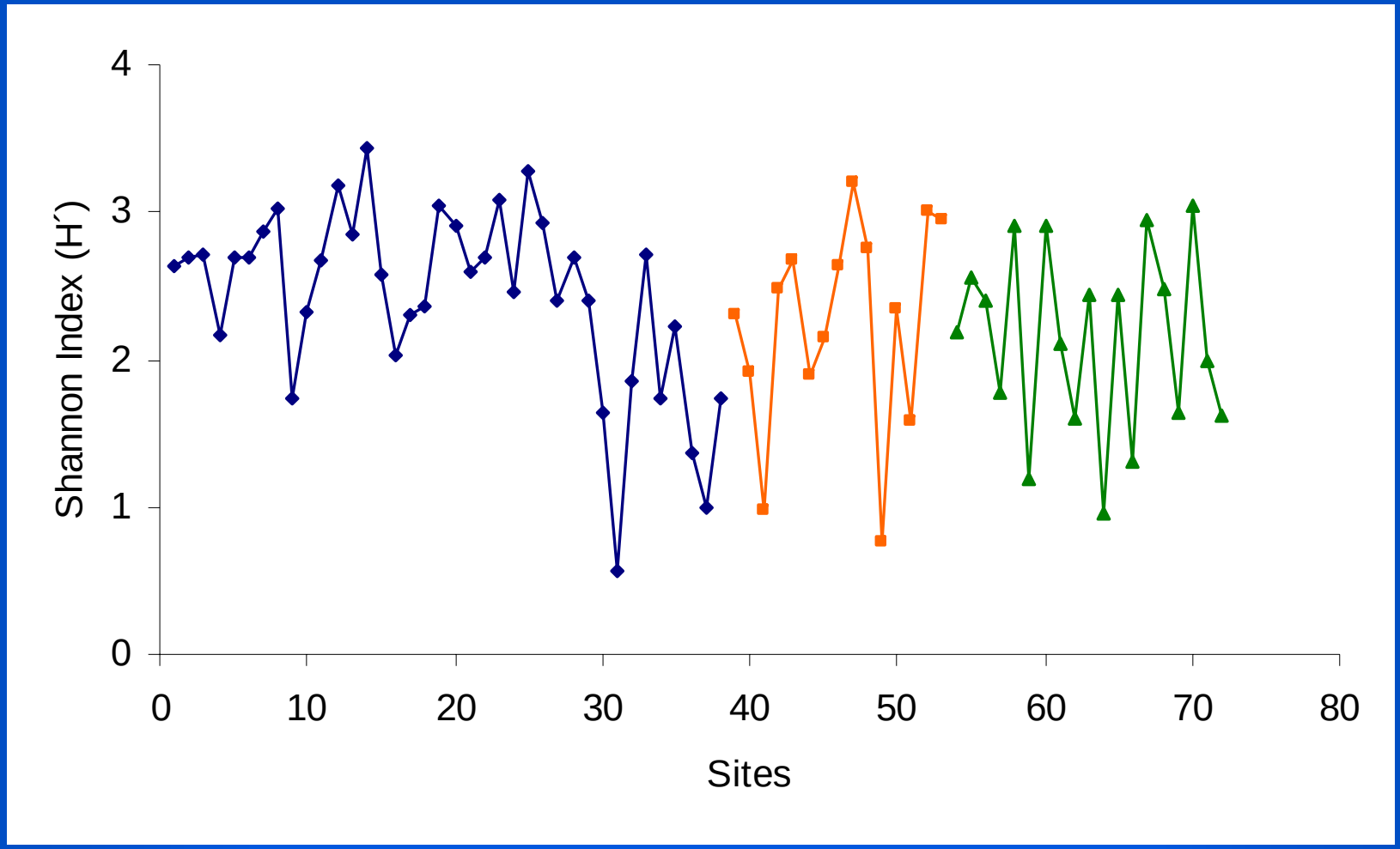
Zone	Mean
30	174.5
40	256.5
60	172.9



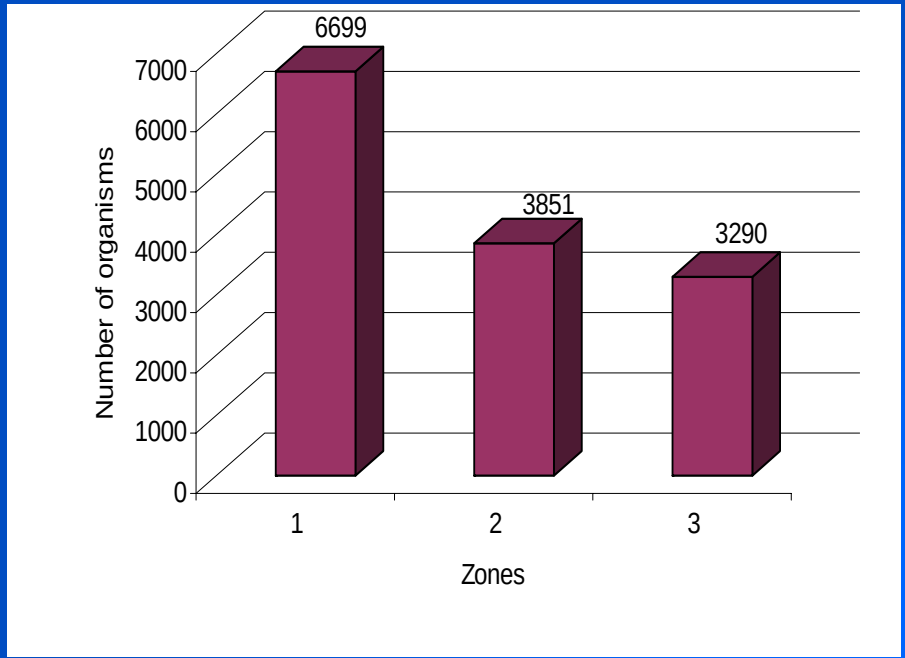
Zone	Mean
30	25.4
40	24.9
60	20.1

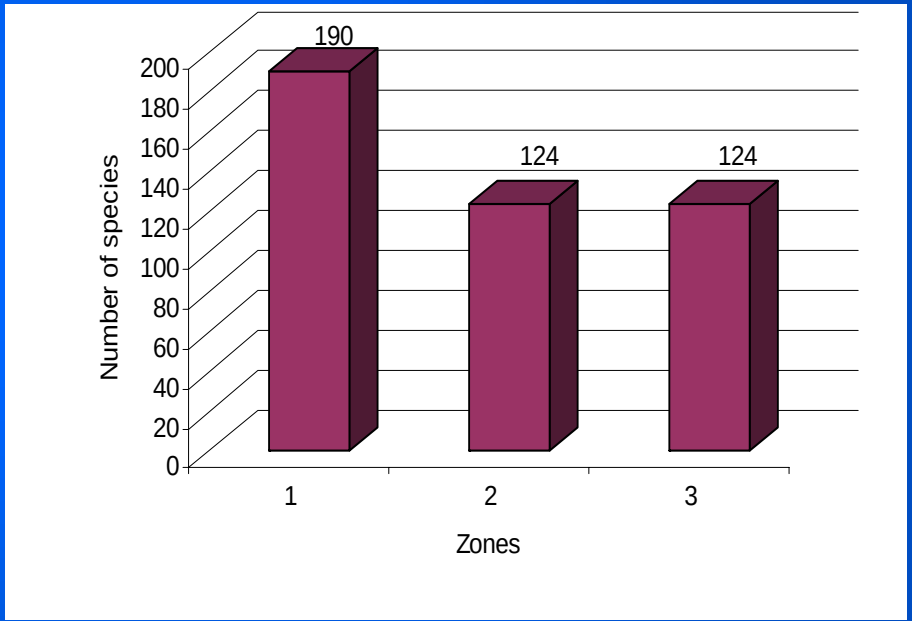


Margaleff index for each sampling site

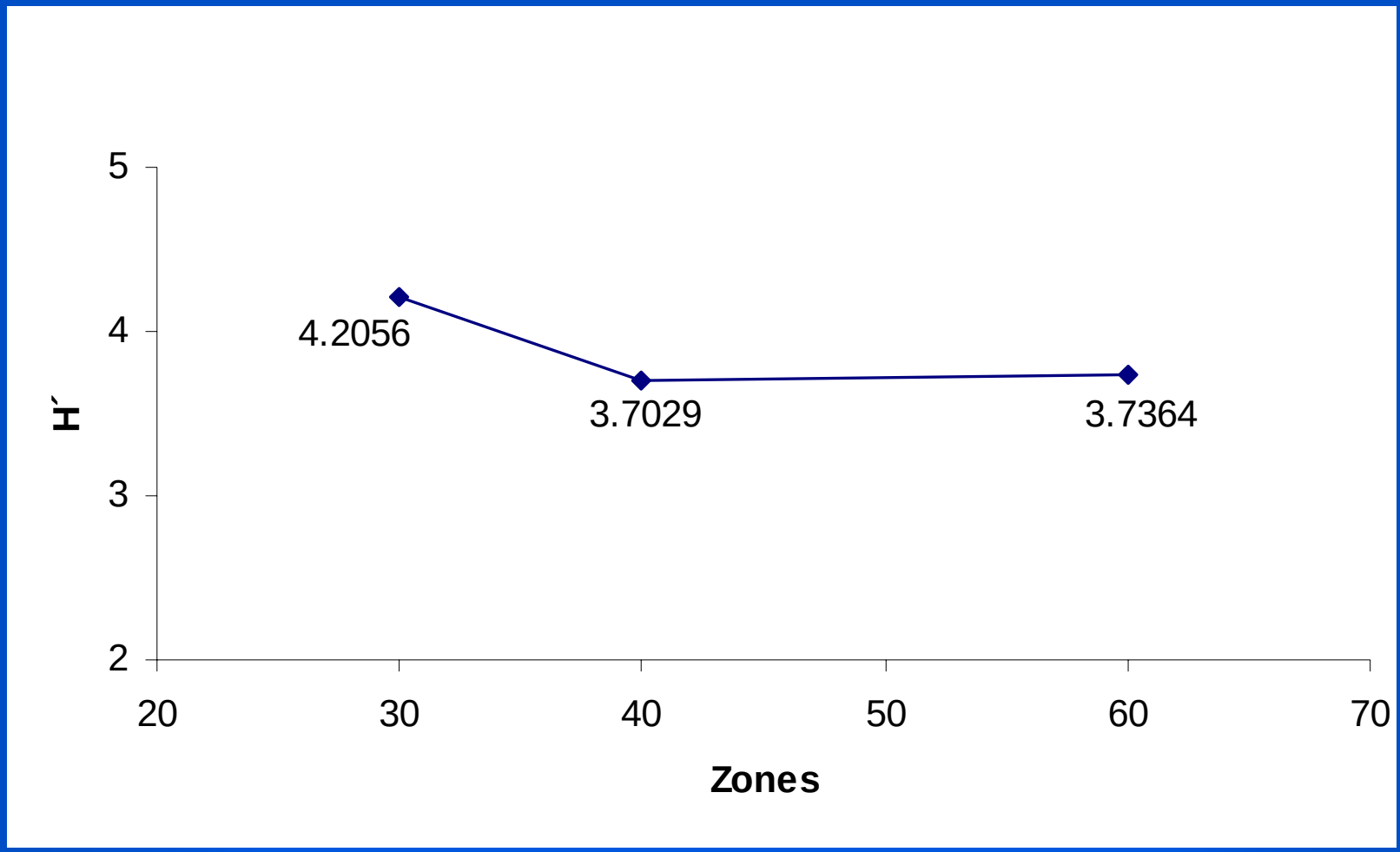


Shannon diversity Index for each sampling site

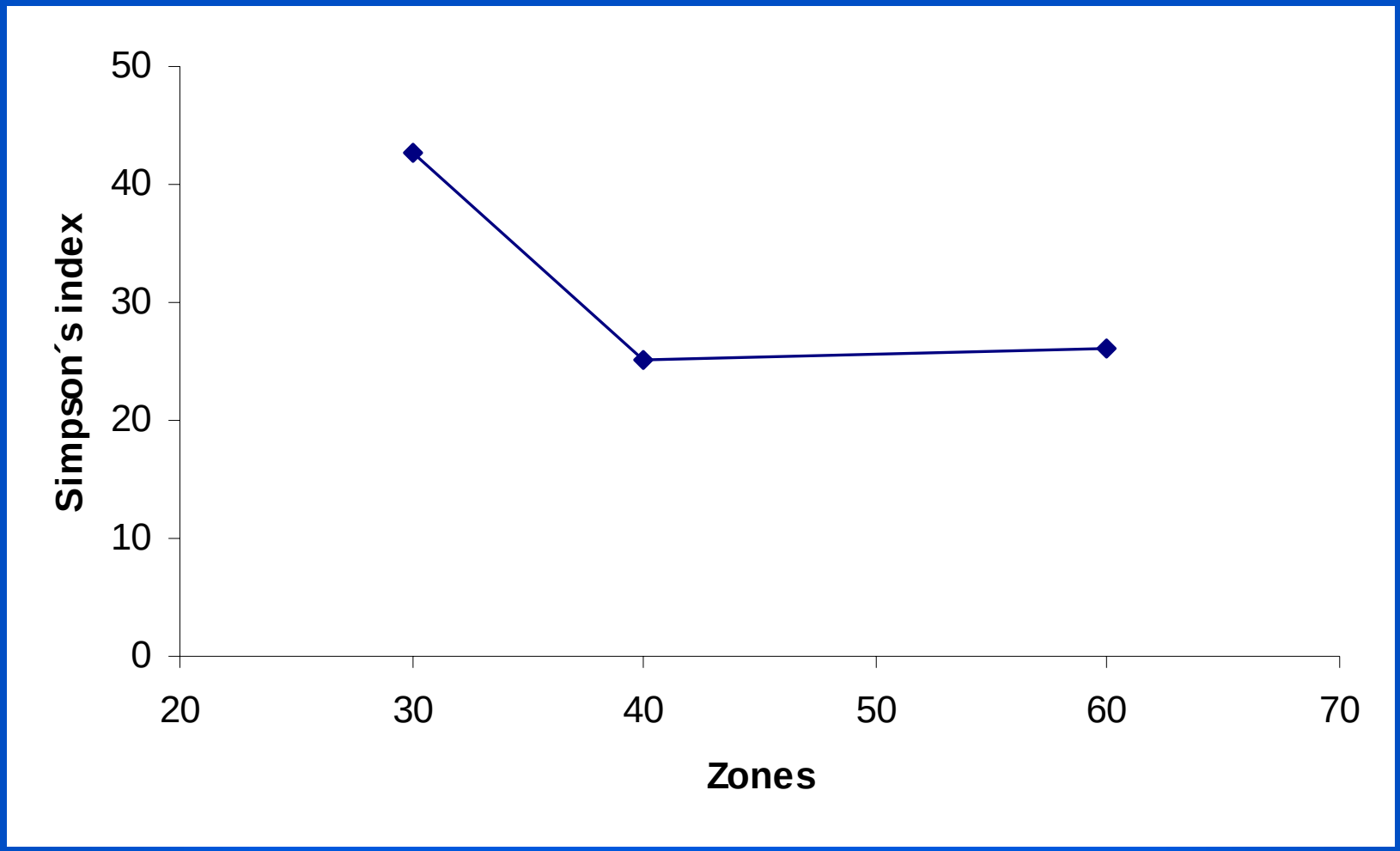




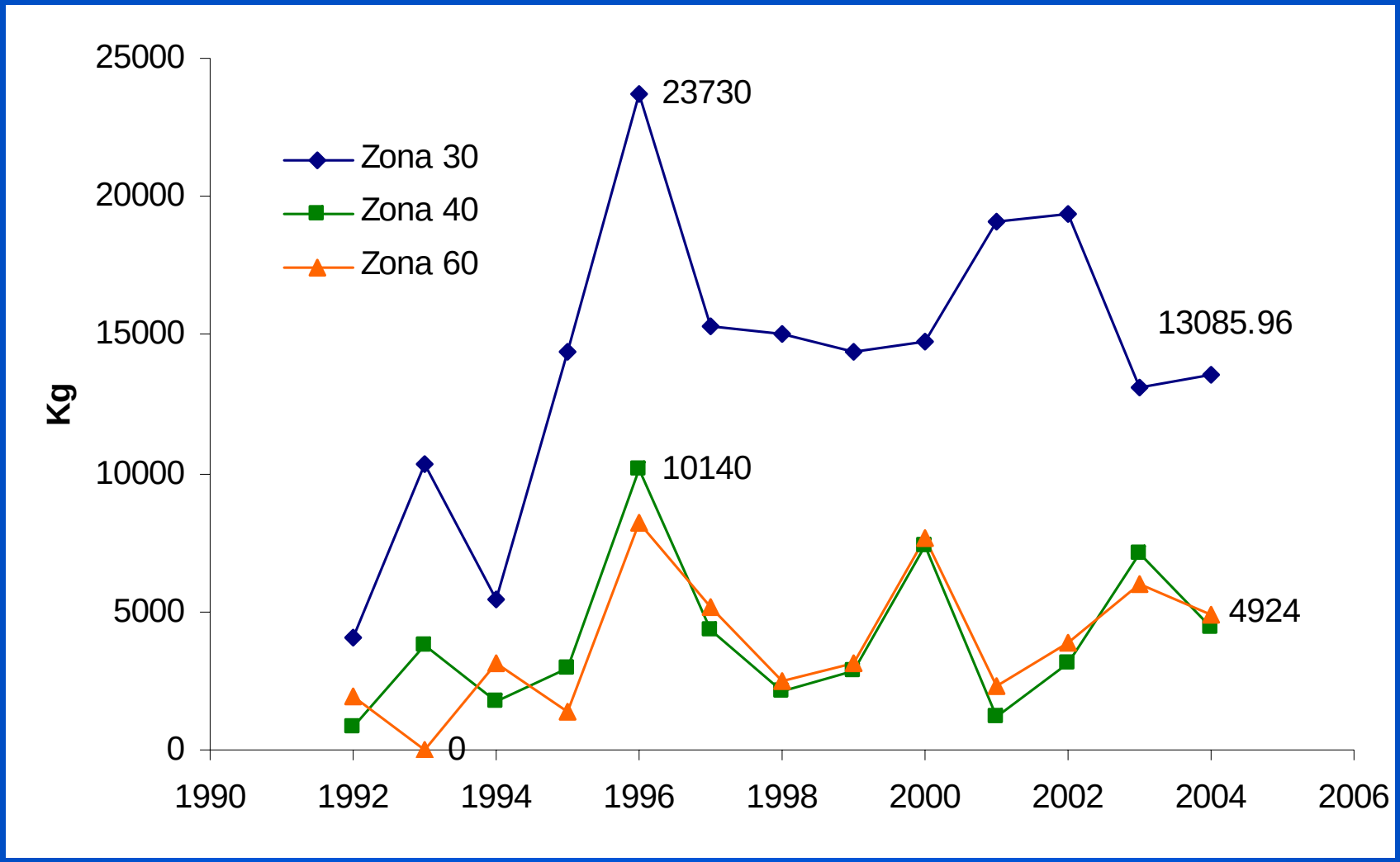
Number of species and organisms in the three sampling zones



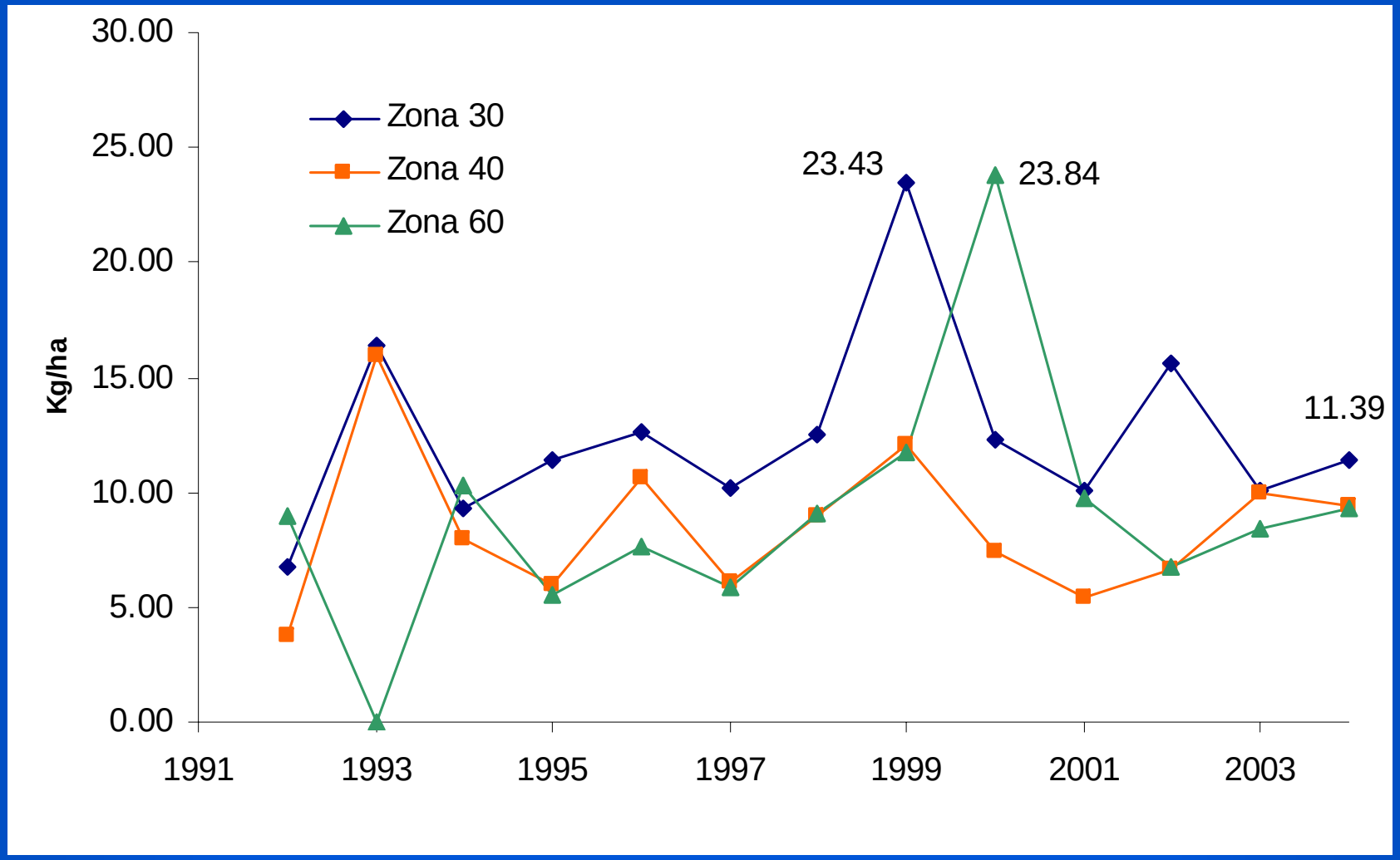
Shannon index of diversity in the different zones



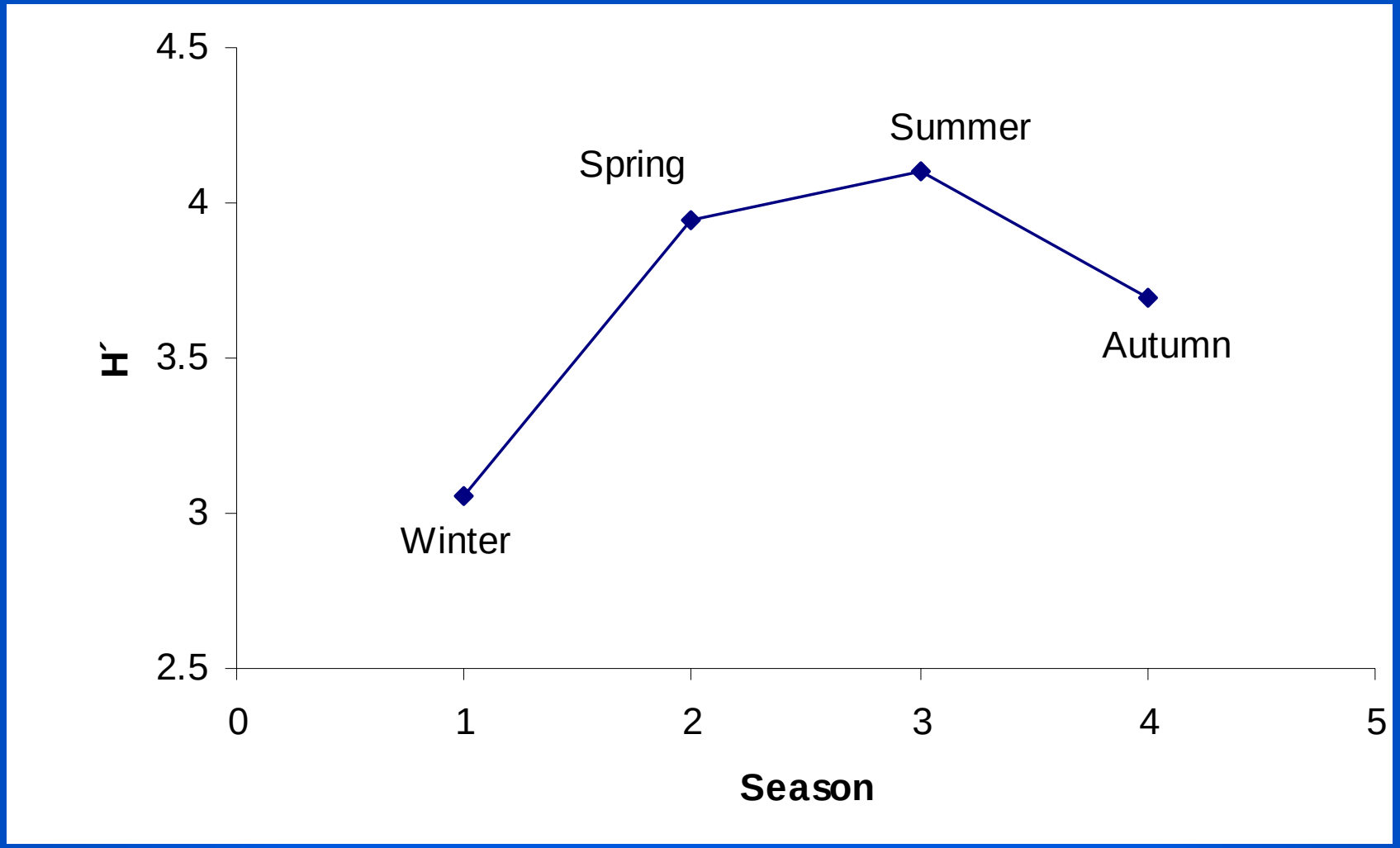
Simpson index of diversity in the different zones



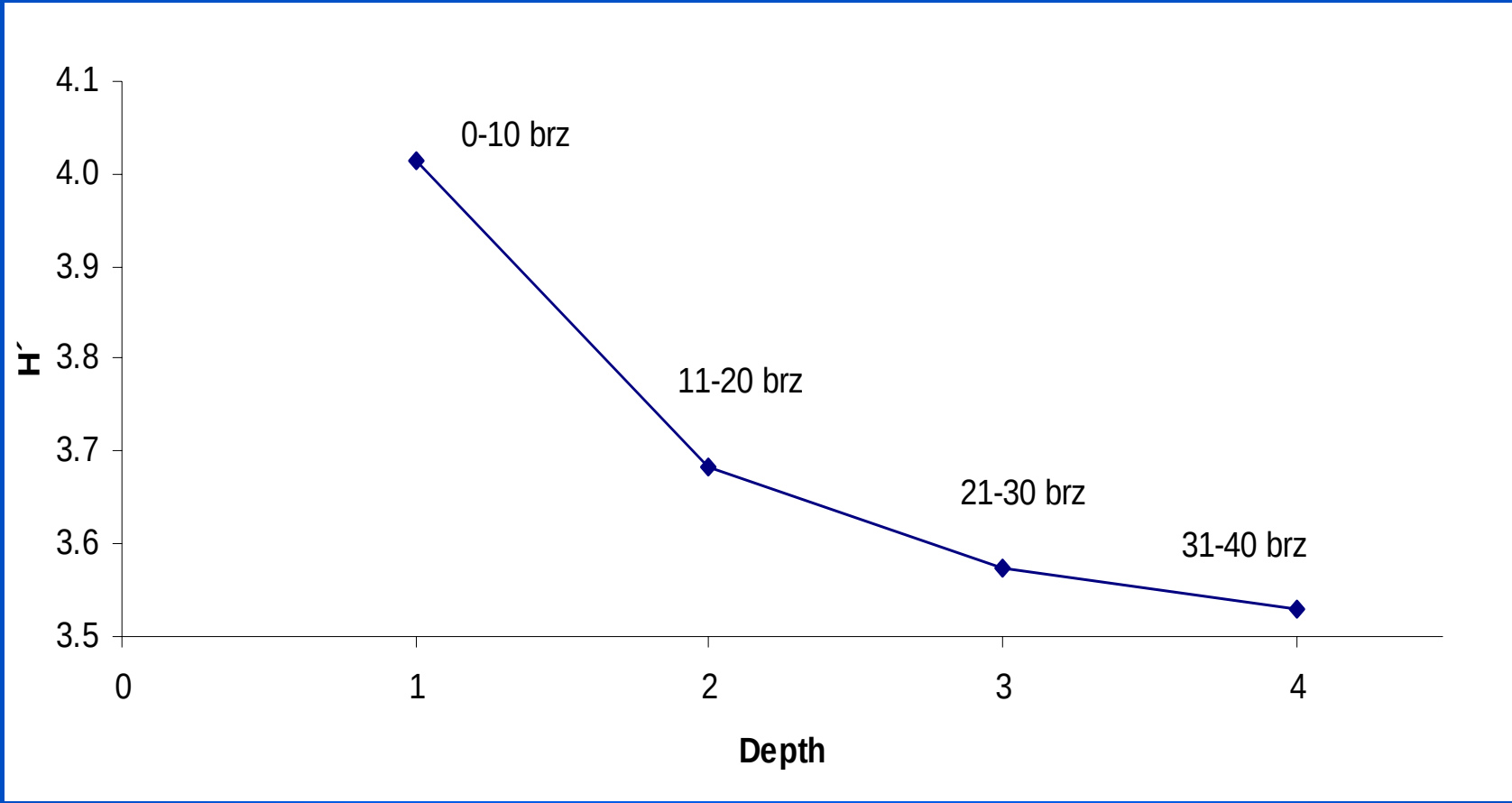
Annual bycatch fauna from 1992 to 2004 in the different zones



Annual bycatch fauna per hectare in the three different zones (1992-2004)



Changes of the Shannon index of diversity trhough the year



Shannon index of diversity against the different depths

Conclussions

The specific composition of the ichthyc comunity along the Sinaloa coast was composed by 219 species in 57 families.

The families that were more representative were: Scianidae (31 species), Haemulidae (18 species), Carangidae (16 species) and Serranidae (16 species).

The more abundant species were: *Orthopristis chalceus*, *Selene peruviana*, *Pomadasys panamensis* and *Synodus scituliceps*.

The diversity increases during the hot months, and decreases during the cold months.

The Northern part of the coast of Sinaloa presents the highest diversity and richness values.

The diversity also changes according to depth, being higher at shallow depths and decreasing towards deeper waters.

Thank you!!!