Distribution of the spiders in the forest ecosystems of the Nebrodi Mounts (Sicily)

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Zoocoenotic researches involve the solution of numerous problems related to the methods of data survey, to their representativeness and to elaboration of quantitative comparisons. The use of pitfall-traps in this type of study allows us : a) to have quantitatively comparable samples in a fixed time span, b) to observe phenology accurately, c) to relate to a compound fraction of zoocoenosis substantially constant in the various habitats (nearly always soil fauna), d) to eliminate the uncertainties typical of direct collecting. This research is part of a more comprehensive attempt to characterize the forest zoocoenosis of the Nebrodi Mountains by this method.

Materials and methods

Pitfall-traps containing vinagre (95%) and formalin (5%) where placed in four different forest habitats along an altitudinal transept of the Caronia Valley : beech forest (B), Turkey oak forest (T), Turkey and cork oak mixed forest (TC), cork oak forest (C).

Ten traps were set in each station and sampling was carryed out monthly from July 1987 to October 1988. From January to April we have no data from the beech forest because of unfavourable climatic events and of the resulting difficulty of access ; nevertheless the fauna present in these months inegligible.

Specimens were first separated by families and then by species, neglecting those families which by the above mentioned method could only be accidentally collected.

Reports of the data in graphs refer only to the adult specimens (white : males, black : females) and to a total of ten traps. In the graphs an asterisk indicates the presence of data which cannot be shown on the scale used by us.

Results

The distribution of the specimens frequencies at the family level (Fig. 1) allowed us to characterize the four forest environments :

-   in the beech forest Agelenidae, Salticidae, Dysderidae and Hahnidae are prevalent ; Atypidae, Ctenizidae and Zodaridae are nearly or totally absent.

-   in the turkey-oak forest Agelenidae, Dysderidae and Salticidae are prevalent ; Zodaridae and Hahnidae are absent.

-   in the mixed forest Ctenizidae are prevalent, Atypidae, Agelenidae and Gnaphosidae are numerous, Zodaridae are frequent, only Hahnidae are nearly absent.

-   in the cork forest Ctenizidae are highly prevalent, Zodaridae are frequent ; Hahnidae and Atypidae are nearly or totally absent.

Fig. 1 - Number of specimens of each family in the four habitats.
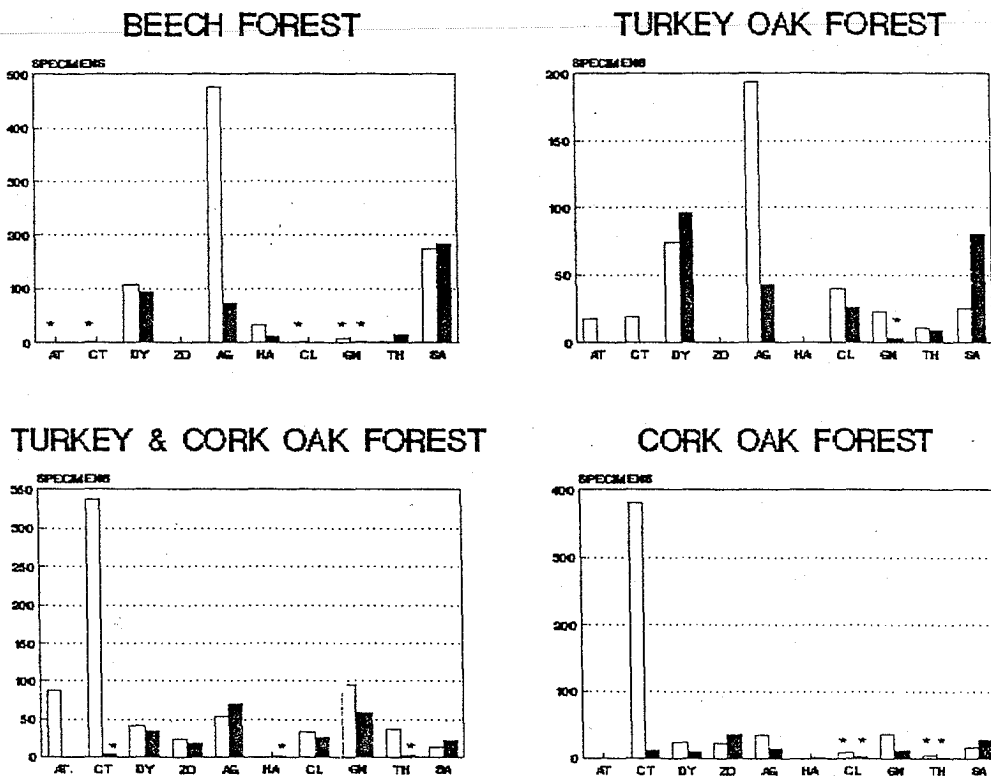
Furthermore, in the beech forest the quantitative unbalance among the families is clearly more evident than in the other three habitats.

The analysis at the species level (Fig. 2) allowed us to point out more precise differences and characteristics :

- as to the number of species the beech forest is the poorest environment, most of them belong to only two families (Agelenidae and Dysderidae).

- the mixed forest is, instead, the richest environment, what agrees with its great heterogeneity ; here only three families include a single species.

Fig. 2 - Number of species of each family in the four habitats.
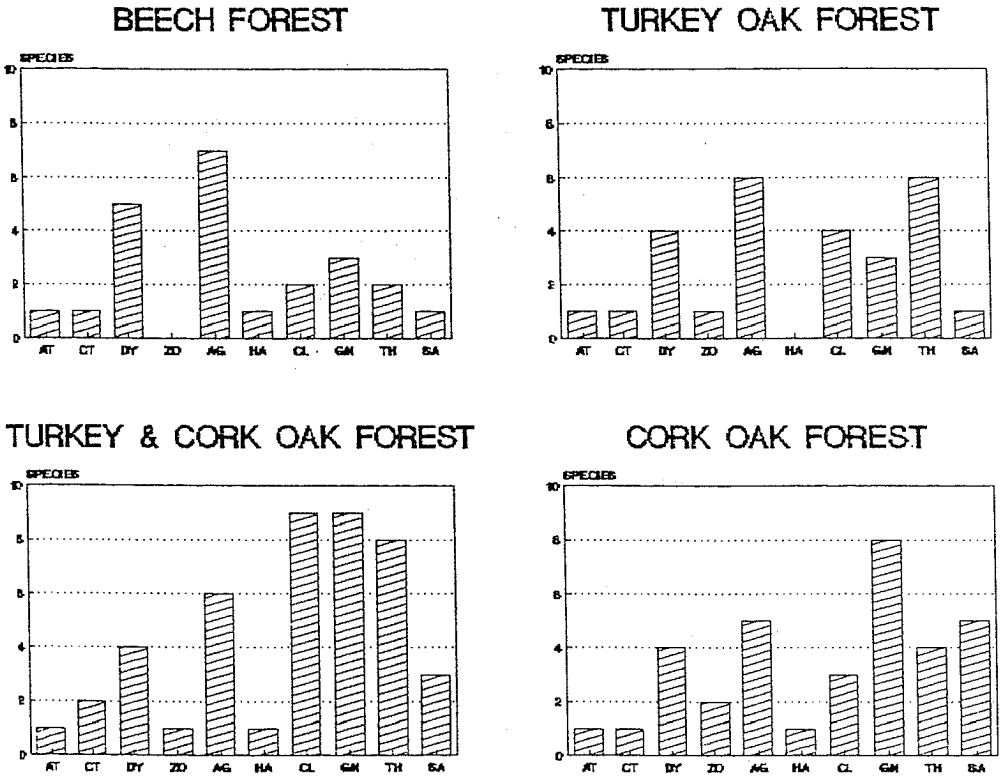
Also the turkey-oak forest and the cork-oak forest show a more homogeneous distribution of the number of species in the families compared to that of the beech forest.

The distribution patterns of the number of species in the families allows a good characterization of the habitats.

The comparison between the number of species in the different stations and the total number of the captured specimens indicates a radical difference between the beech forest and the other habitats (Fig. 3).

Fig. 3 - Number of species and specimens in the four habitats.

SPECIES

| 60 | 40 | 30 | 20 | 10 | 0 |

B   T   TC   C

SPECIMENS

| 1400 | 1200 | 1000 | 800 | 600 | 400 | 200 | 0 |

B   T   TC   C