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Relations between chaetotaxis and ecological type of Linyphiid spiders

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INTRODUCTION

The chaetotaxis of Linyphiid spiders is understood above all as a useful taxonomical sign. The differences of spines among related species make possible the idea, that this is a young phylogenetical sign which has origin at the differentiation of the species, influenced by specific ecological conditions. The answer of the question "what is the reason of differencies in chaetotaxy, why is the given structure present" has the possible explanation, in functional aspects of development of spines and trichobothria (Peters & Pfreundt, 1985; Pfreundt & Peters, 1981; Reissland & Görner, 1978).

METHOD

Estimation of chaetotaxis and ecological type according to the data published in Braun (1992), Dziabaszewski (1976), Heimer and Nentwig (1991), Locket and Millidge (1951), Locket et al. (1974), Miller (1971), Roberts (1984), Wiehle (1956) and Wiehle (1960).

Evaluated factors: chaetotaxis and ecological aspects.

Chaetotaxis:
- ☐ position of trichobothrium on Ist metatarsus,
- ☐ number of tibial spines,
- ☐ presence of trichobothrium on IVth metatarsus.

Ecological aspects:
- ☐ degree of hygrophilie,
- ☐ degree of thermophilie,
- ☐ stratum of vegetation.

Remark: The data processing needed generalization, e.g. the average for the genus consisting of more species with different values. The estimation of statistical significance—the chi-square test. We present only the results with probalility of error below 5% ($p < 0.05$).

RESULTS

1. The position of Tm I is connected with the presence of Tm IV. As far as Tm IV is present, Tm I occurs in the distal part of the metatarsus (Fig. 1).
2. By the xerophil species of the subfamily Linyphiinae, the position of Tm I on the proximal part of the metatarsus is characteristic. In the subfamily Erigoninae, the xerophil species are characterized by a formula of tibial spines 1111 (Fig. 2).

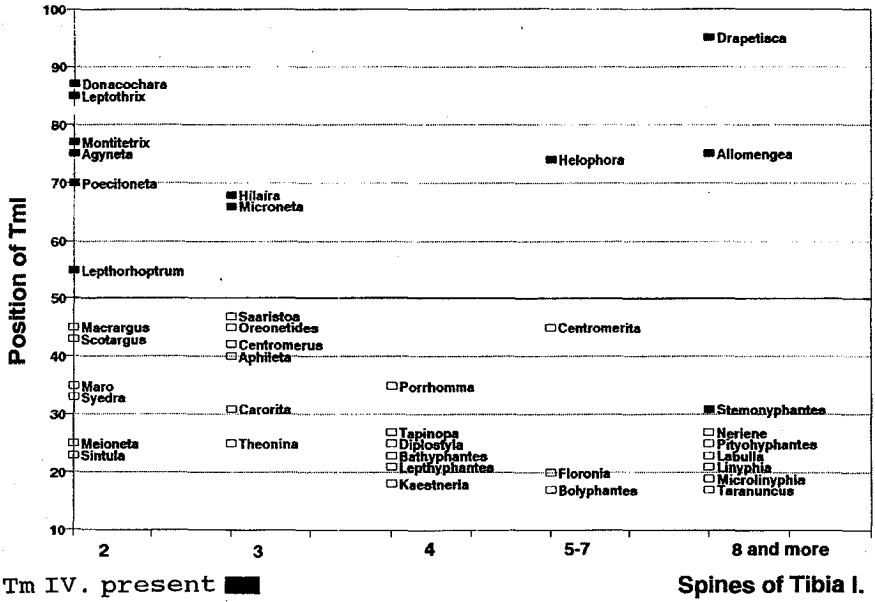

Fig. 1. Presence of Tm IV. Linyphiinae: Tm I > 50 ($p < 0.01$); Erigoninae: Tm I > 70 ($p < 0.01$).

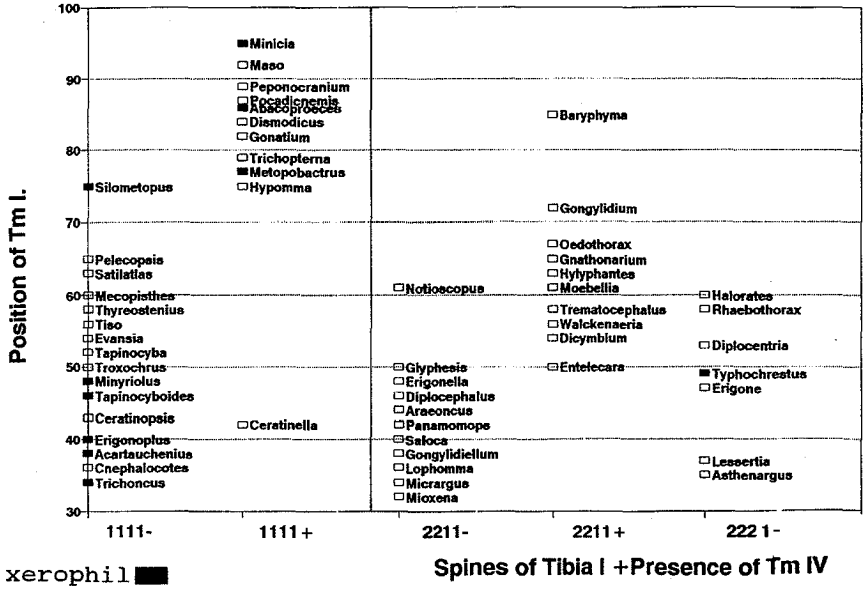

Fig. 2. Xerophilic species. Linyphiinae: Tm I < 50 ($p < 0.001$); Erigoninae: Tib I 1111 ($p < 0.01$).

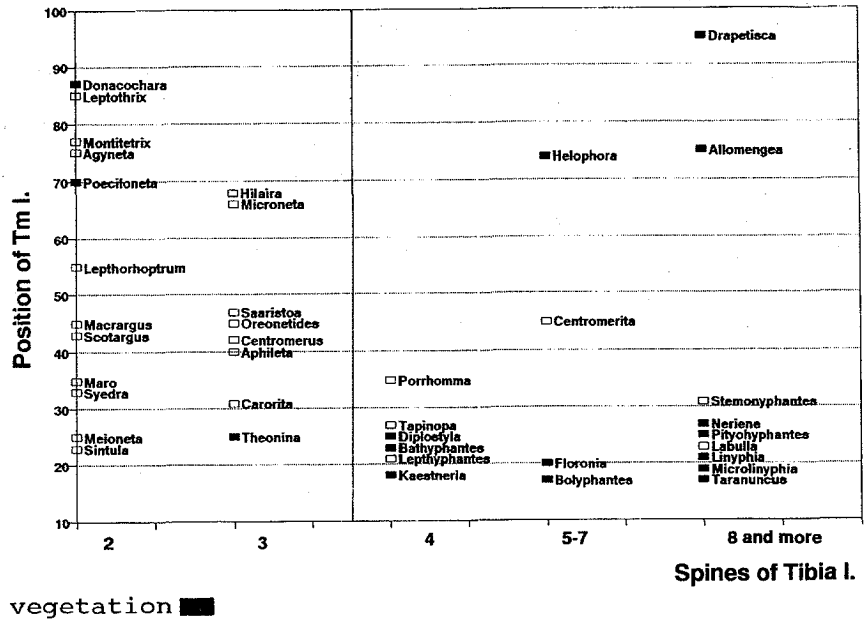

Fig. 3. Vegetation species. Linyphiinae: Tib I > 3 ($p < 0.001$); Erigoninae: Tm I > 50 ($p < 0.001$).

3. The representatives of the Linyphiinae which live on a vegetation, have a higher number of spines on the Tib I (more than three) (Fig. 3).
4. The mountain species of the Erigoninae have a characteristic chaetotaxis, i.e. larger spines (considerably more frequent in Tib arrangement 2221) and the Tm I on the distal part of the metatarsus.

SUMMARY

Some ralations chaetotaxis vs. ecology are presented and in addition, the rules of the relations spines vs. trichobothria. The possible explanation may be the fact that in a certain environment the spines and trichobothria have the functional purpose and its variations can be the result of the ecological adaptation.

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