The Collembola Colonization on Recultivation Areas of the Ville

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Summary: In the Rhinish brown-coal-region agricultural acreage is being recultivated after a new system since the beginning oft he 1960ies: Inanimated Loess from great depth, mixed with water, is spread over the areas in a 1-2m thick layer after the coal-extraction. In order to evaluate the Collembola soil samples were taken from five thus layed out different aged areas during ten months – from April to December 1979 every two months. Areas recultivated in the years 1978, 1977, 1972, 1976 and 1963, ie Age at time of sampling <1 year; 2, 7, 12 and 16 years; 5 sampling sessions at intervals of two months from April to December 1997; two soil layers 0-4.5 cm and 4.5-9cm depth of 24 spots of 7 cm², total surface on each area approx 170cm². For 16-100-fold stereo microscope magnification, a total of 29.095 animals were isolated from the soil samples. Approximately 1/3 were Collembola, and 2/3 were mites and other Artrhopods. Most of the overall 8.652 springtails were could be identified to species. 1.200 Collembola were subject to permanent preparations for a closer light-microscopic examination at 160- to 1.200-fold magnification.

Results:

- At least 50 species of Collembola were determined with numerous *Entomobryomorpha* among them, few *Poduromorpha* in relation to other agricultural positions in ancient soils, and very numerous *Symphypleona*.
- The *Isotomidae* were the most numerous family.
- Even 16 years after the recultivation there were still many more Collembola found in the upper soil layer (0-9cm depth) than in comparable ancient agricultural soils.
- Preponderating species in the order of their occurrence were *I. palustris* (+ *I. viridis*), *H. assimimilis* and *I. notabilis* during the first two years after the recultivation. Afterwards the development became a bit difficult to look through because of the human influence, however:
- *I. notabilis*, *C. caecus*, *F. candida* and *M. krausbaueri* seem to be part of the Collembolan fauna in these recultivated areas.
- *I. palustris*, *I. viridis* and several E*ntomobryidae* (esp. *L. lanuginosus*, *E. marginata*) showed habitat changes.
- The whole population of Collembola showed a maximum in October and a minimum in December. This marks only a trend, however, which certain Collembola species on cartain fields or all Collembola of a field under certain circumstances may vary from.
- Relations exist between the occurence of some surface inhabiting species – probably wind borne – and the structure of the covering of vegetation.
- The colonization of the deeper soil layer (here 4,5-9cm depth) by e.g. *C. caecus*, *M. krausbaueri*, *F. fimetaria*) happens slowly and probably more subterranean from the field borders.

Further informationen: HERMOSILLA, W. (1982): Sukzession und Diversität der Collembolenfauna eines rekultivierten Ackers. I.. Revue d´Écologie et de Biologie du Sol, 19 (2) : 225-236