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## Diversity and dynamics of soil mesofauna associated with natural grasslands in central India

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**Key words:** acari, collembola, natural grassland, community structure, seasonal dynamics

**Introduction** Although on a decline, the natural grasslands serve as an important source of forage supply for livestock in selected regions of India. In Central Indian region natural grasslands are classified as *Sehima-Dichanthium* cover (Dabadghao & Shankarnarayan, 1973). There is almost no information on the aspects related to diversity of soil mesofauna associated with such grasslands and their dynamics. In this paper an account of soil mesofaunal diversity, their seasonality and dynamics in natural grasslands of Central India is presented.

**Materials and methods** The study was conducted at Jhansi (25° 27' N latitude and 78° 35' E longitude and about 275 msl). The natural grassland consisted of a mix pasture stand, including dominant species like *Heteropogon contortus*, *Sehima nervosum*, *Chrysopogon fulvus* and *Dichanthium annulatum*. The soil of the area is classified as neutral red alfisol of low to medium fertility. During 2003-2004 monthly soil samples (6.5 cm diameter and 15 cm depth) were collected for assessing soil biodiversity using standard methodology.

**Results and discussion** Fourteen collembola and fifty four acari species were found to be associated with natural grasslands of Central Indian region. The collembola families were Isotomidae, Entomobryidae, Sminthuridae, Neanuridae and Onychiuridae. Isotomidae was the most dominant and represented by three genera (*Proisotoma*, *Folsomia*, *Isotomurus*). The second most dominant family was Neanuridae (*Brachystomella*). The other families viz. Entomobryidae, Sminthuridae, Onychiuridae were represented by three (*Lepidocryptus*, *Entomobrya*, *Orchesella*), three (*Symphyleona*, *Neosminthurus*, one unidentified) and one (*Sensiphorura*) genera, respectively. Acari were the dominant group constituting (76%) of the population followed by collembola (24%). Four suborders of acari were encountered of which cryptostigmata was most dominant (76%; 32 species) followed by prostigmata (13%; 12 species); mesostigmata (10%; 7 species); astigmata (> 1%; 3 species). The dominant acarine families were Scheloribatidae, Epilohmanniidae, Galumnidae, Perlohmanniidae, Oppiidae, Oribatulidae, Hydrozetidae, Caligonellidae, Tarsenomidae, Gamasellidae and Dermanyssidae. Highest species diversity and peak population build up of the mesofauna was observed in the monsoon months. Values of various diversity indices (Table 1) support this observation. Of the various abiotic factors, soil moisture availability had the greatest effect on the population of acari ( $r = 0.81$ ) and collembola ( $r = 0.79$ ). The mesofauna build up has significant implications in habitat conservation (Siepel, 1996).

**Table 1** Diversity indices for soil mesofauna in the grasslands of Central India.

Indices	Collembola			Acari		
	Winter	Summer	Monsoon	Winter	Summer	Monsoon
Shannon-Wiener	1.18	0.99	1.89	2.26	2.27	2.33
Margalef's	1.06	1.64	1.57	2.91	2.94	3.62
Simpson's Dominance	0.42	0.40	0.17	0.17	0.14	0.19

**Conclusions** The natural grasslands of Central Indian region support rich soil biodiversity. It is important from a conservation viewpoint to preserve the mesofaunal biodiversity attributes of such habitats as well as their fodder resource capacity.

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