

Deterioration of soil quality of tropical home gardens- a case study from Kerala, India

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INTRODUCTION

Tropical home gardens are important agroforestry systems and soil quality monitoring using soil fauna is a good tool to assess the soil quality of home gardens.

OBJECTIVES

To compare the soils and soil microarthropods in the home gardens of an industrial and non industrial site.

To get an overview regarding soil quality of home gardens.

To compare the management options used in the home gardens of two sites.

Overview of the study area

The study was conducted in Eloor (industrial area) and Chengamanad (non industrial area) in Kerala, India.

METHODOLOGY

Estimation of soil parameters and microarthropod fauna in the home gardens

Soil physicochemical parameters and soil microarthropod fauna of the two sites were compared.

Management practices followed by the home gardens were compared.

MAIN RESULTS

Soil samples showed variation in physicochemical parameters during summer and monsoon seasons.

In Chengamanad microarthropods were represented by collembola, coleoptera, hymenoptera, araneae, acari and diplopoda.

In Eloor microarthropod population was represented by coleoptera, hymenoptera, araneae, diplopoda. Disappearance of collembola and acari in Eloor home gardens indi-

cate a reduction in soil quality.

The absence of collembola and acari groups in Eloor may be either due to soil pollution or intensive soil management.

Measures for maintaining soil quality in home gardens

Soil quality can be improved by certain measures like maintaining top canopy layer.

Soil carbon and moisture content can be increased by providing mulches to trees.

Large and old home gardens should be kept as such without much manipulation.

Constructions can be made in such a manner that the total free land space available in a locality is kept constant.

In industrial areas, soils has to be periodically monitored for pollutants which check the survival of soil organisms and pollution abatement

measured has to be undertaken.

The study emphasizes the need to minimise the intensive management practices in the home gardens like removal of leaf litter, burning of leaf litter etc. which will affect soil microarthropod survival.

There is a need to increase the management practices which promote microarthropods like mulching which increase soil health indicating microarthropods.

CONCLUSION

The study points out to the need for improvement of soil quality of the home gardens. This can be done by increasing the soil health indicating microarthropod fauna by adopting proper management practices and periodical soil monitoring.



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Soil parameters	Eloor	Chengamanad
Temperature(°C)	30 ±1.45	27.8±1.26
pH	5.94±0.65	6.5±0.65
Moisture(%)	12.38±6.87	14.48±3.85
Organic matter(%)	1.76±0.48	2.92±1.47

Tab. 1: Soil parameters of home gardens in Eloor and Chengamanad, Kerala, India

Parameters	Comparison	
	Eloor	Chengamanad
Average area	0.02-0.04 ha	0.02-0.20 ha
Vegetation cover	herbs, shrubs, trees	herbs, shrubs, trees
Microarthropod groups	coleoptera, hymenoptera, araneae, diplopoda	collembola, coleoptera, hymenoptera, araneae, acari, diplopoda
Management practices	Burning leaf litter, removal of soil litter cover	mulching, providing manure like cowdung, maintaining soil litter cover

Tab. 2: Comparison of home gardens in Eloor and Chengamanad, Kerala, India



Fig. 1: Home garden in Chengamanad, Kerala, India without much soil management



Fig. 2: Home garden in Eloor, Kerala, India with soil management



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