

MILLIPEDES OF A MAQUIS ECOSYSTEM (NAXOS ISLAND, GREECE):
PRELIMINARY DESCRIPTION OF THE POPULATION (DIPLOPODA)

by

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ABSTRACT

A mediterranean maquis ecosystem has been studied on the island Naxos (Greece). Five typical areas, spatially distributed as a mosaic pattern, have been characterized by the structure of the vegetation. Inside each of these units, the millipede population is composed of five species, whose main activity period in the upper soil layers has been investigated monthly.

INTRODUCTION

The soil fauna of a Greek maquis ecosystem has been studied since 1982 on the cycladian island of Naxos. In this site, millipedes appear as one of the most important components of the saprophagous macroarthropod community. They obviously have a great taxonomical and biogeographical interest too: a new species and a new subspecies have been recently described from this site (Mauriès & Karamaouna, 1984). This short paper deals with the structure of the millipede population and the comparative activity periods of the different species.

The study site is situated near the South-East coast of Naxos island, on the seaward slope of a hill. Five subunits have been distinguished within the maquis ecosystem: they are characterized by the structure of the vegetation and the litter (table I) and they are distributed in space as a mosaic pattern. Litter and humus (3 to 8 cm thick) and soil surface (2 cm deep) are investigated in the units A, B, C

and D. In unit E, investigations are realized towards the soil under stones. This soil belongs to the terra-rossa type on limestone.

METHODS

A quantitative sampling has been performed from november 1982 to november 1983. Each month, three to five samples of equal size (25 × 25 cm each) were removed from the litter areas A, B, C and D. Animals were extracted from samples using a Berlese-Tullgren apparatus during 10 to 14 days. In unit E, five squares (1 m² each) were sampled monthly; millipedes were collected from soil and under stones by hand.

TABLE I

The five subunits of the maquis ecosystem on Naxos island.

Main vegetation species	Investigated layers
A: <i>Juniperus phoenicea</i> Linnaeus	Litter, humus and soil upper layer
B: <i>Pistacia lentiscus</i> Linnaeus	Litter, humus and soil upper layer
C: <i>Olea europaea</i> Linnaeus subsp. <i>sylvestris</i>	Litter, humus and soil upper layer
D: <i>Quercus coccifera</i> Linnaeus	Litter, humus and soil upper layer
E: Short vegetation areas <i>Urginea maritima</i> (Linnaeus) Baher	Stones and soil

RESULTS AND CONCLUSION

Five millipede species are present in the ecosystem investigated. *Megaphyllum bicolor crassiflagellum* Mauriès & Karamaouna and *Anamastigona matsakisi* Mauriès & Karamaouna are dominant. *Polyxenus lagurus* (Linnaeus) is often present in the litter and soil but not very abundant. *Pachyiulus flavipes* (C. L. Koch) and one unidentified species of Polydesmidae are very rarely found. Table II gives a very similar

TABLE II

The millipede population structure. xxxx: dominant species; xx: frequent but scarce species; x: very rarely found species.

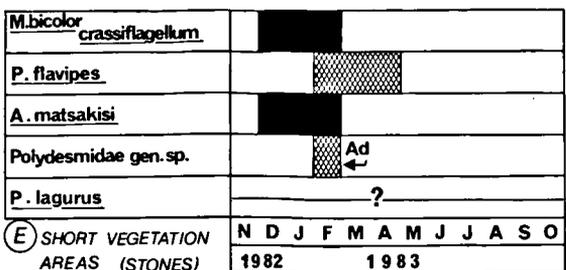
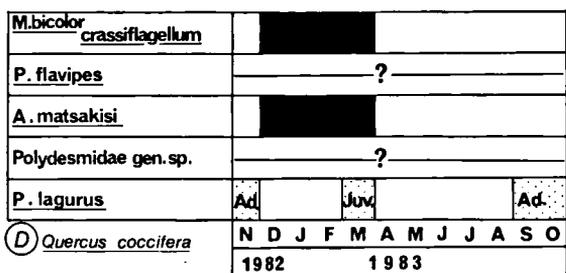
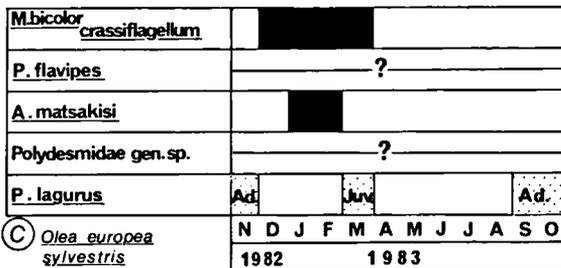
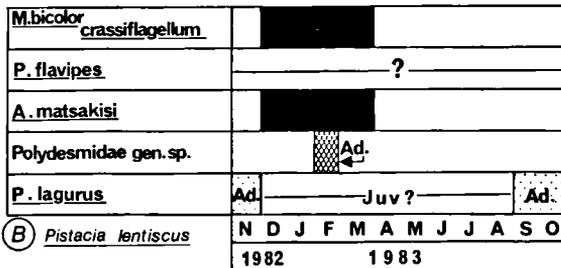
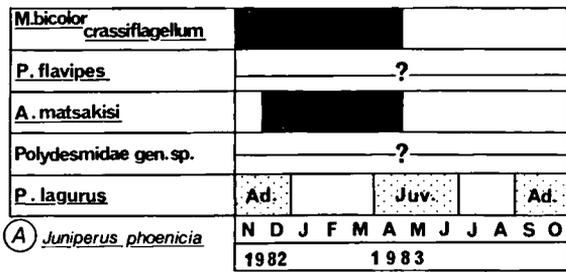
Species	Ecological subunit (cf. table I)				
	A	B	C	D	E
<i>Megaphyllum bicolor crassiflagellum</i> Mauriès & Karamaouna	xxxx	xxxx	xxxx	xxxx	xxxx
<i>Pachyiulus flavipes</i> (C. L. Koch)	x	x	x	x	x
<i>Anamastigona matsakisi</i> Mauriès & Karamaouna	xxxx	xxxx	xxxx	xxxx	xxxx
Polydesmidae gen. sp.	x	x	x	x	x
<i>Polyxenus lagurus</i> (Linnaeus)	xx	xx	xx	xx	xx

TABLE III

Average seasonal rainfall (mm) on Naxos island.

Spring	Summer	Autumn	Winter	Annual Rainfall
80.1	5.2	91.0	220.4	396.7

Fig. 1A-E. Activity periods of millipede species in the five ecological subunits. Black areas: dominant species; stippled areas: frequent but scarce species; crosshatched areas: very rarely found species. In black areas, adults and juveniles are not distinguished. —?—: Species absent in the samples but probably present in the soil at this time.



type of abundance structure from one subunit to another. The average population structure is the same in the five ecological subunits but the millipedes differ by their activity period in the upper layers.

Fig. 1A-E shows that the surface activity period is very short and confined to wet months during winter and spring. The absence of animals in the samples from May to October is partly related to the dryness of the soil during this period. On Naxos island, the average rainfall is very low and only winter is a rather wet time during the year (table III).

Anyhow, this first investigation shows that the community structure is similar in the different litter areas (fig. 1A-D) but differs under stones and in soil of short vegetation areas (fig. 1E). These observations are now to be completed by phenology, population dynamics and

function of millipede species in the decomposition of organic matter (in project).

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