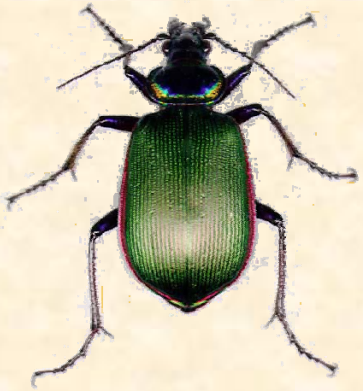
National & Kapodistrian University of Athens

A COMPARISON OF ARTHROPOD COMMUNITIES AT BURNT AND NON-BURNT MOUNTAIN SIDES



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Introduction

• Fires are a major source of habitat change in Mediterranean ecosystems

• Fires are more common at low elevations, but they do occur at medium and high elevations too

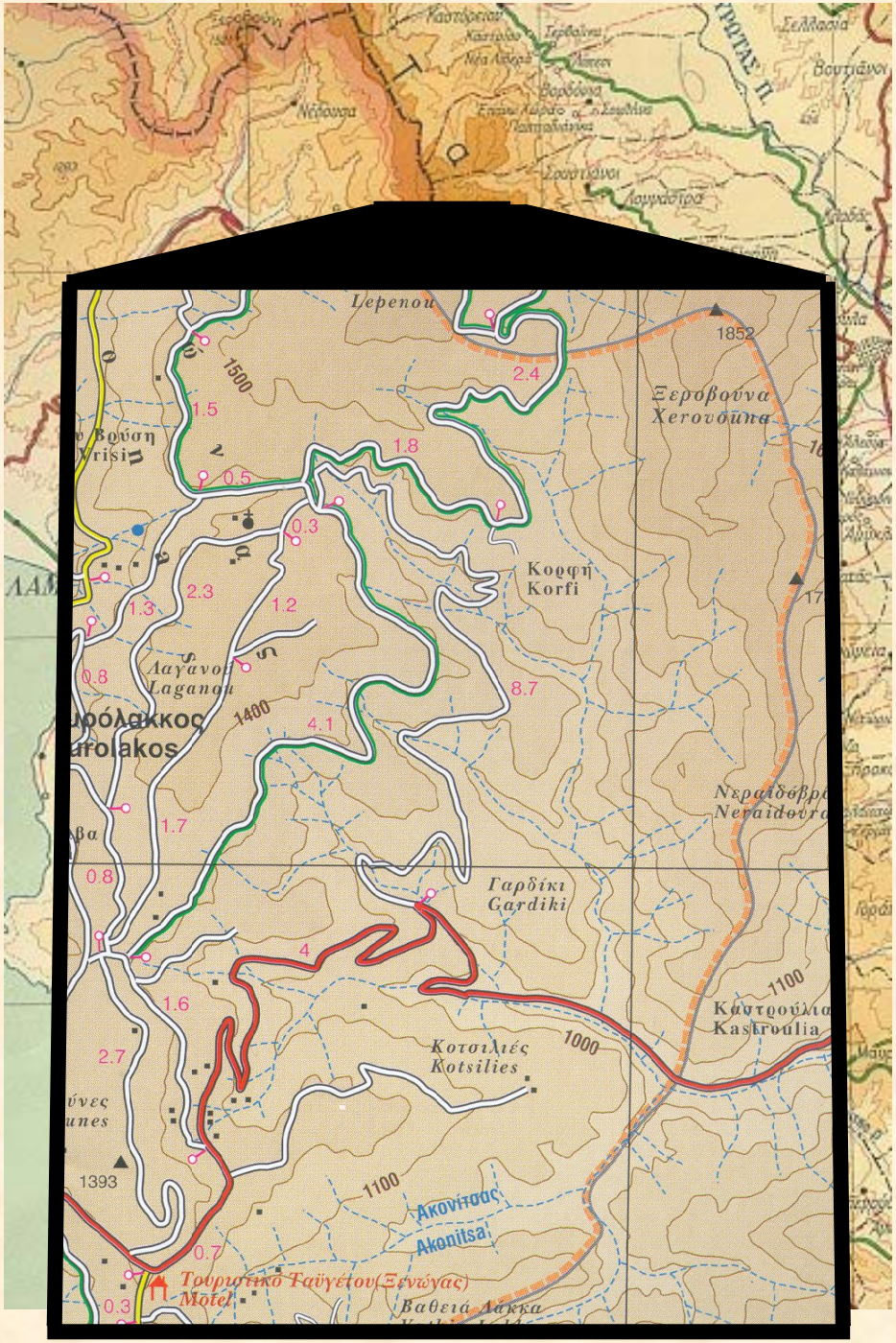
• The effects of ‘mountain fires’ on the diversity of animal communities have not received so much attention

In this work we attack the question:

Are the communities of terrestrial invertebrates showing any differences among burnt and non-burnt mountainous sites ?

Methods

Sampling Period	April – November 2001 (7 months)
Sampling Frequency	Monthly
Sampling Method	• Standard Pitfall Traps (plastic cups of 250ml containing about 50ml of ethylene glycol) • 8 traps per biotope laying on a transect lines, and having a distance of 15m between them (in AL biotope → 12 traps due to higher heterogeneity)

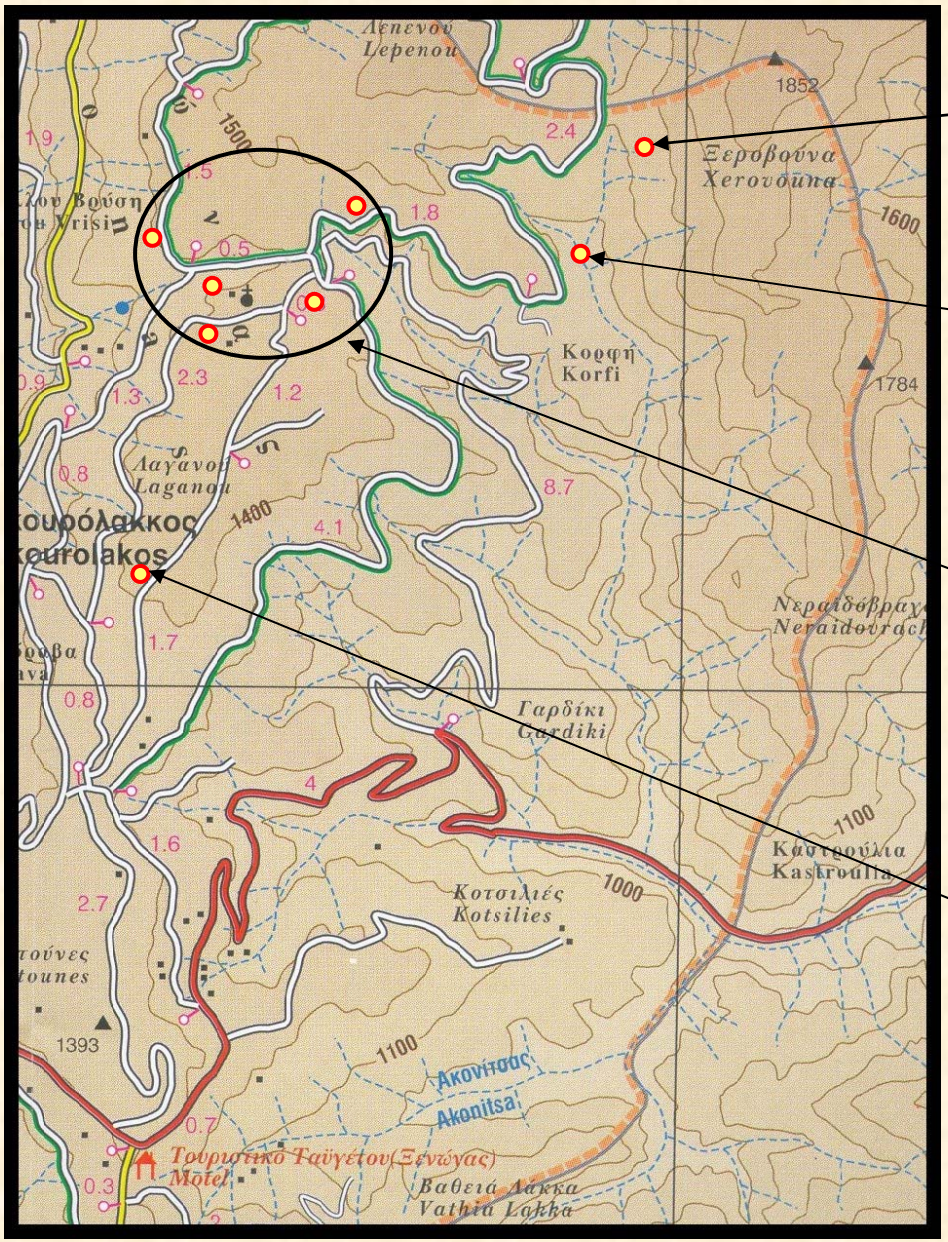


Study Area

- South-East Peloponnisos
- North slopes of Mt. Taygetos
  37º 06' North – 22º 15' East

- Altitudinal Range
  1400 – 1650 m

Biotopes



- Sub-Alpine [AL]
- Mixed Coniferous Forest (*Pinus nigra* & *Abies cephalonica*) [MF]
- Burnt Forest [K1 – K5]
- Neighboring Burnt [KA] And Non-Burnt (*Pinus nigra* forest) [AK]

Open Biotopes

Sub-Alpine

[AL]

- **Altitudinal Range**: ≅1650 m.
- **Aspect**: West
- **Coverage**: Rocks, Bushes, Shrubs, Bare Soil.
- **Vegetation**: *Juniperus communis*, *Astragalus* sp., *Poa* sp., *Daphne oleoides*, *Abies cephalonica*, *Ranunculus* sp., Compositae, Gramineae.

Open Biotopes

Burnt

[K1]

[K3]

- **Altitudinal Range**: 1420-1470 m.
- **Aspect**: Varying
- **Coverage**: Shrubs, Burned Logs.
- **Vegetation**: *Trifolium* sp., *Pteridium aquilinum*, *Verbascum* sp., *Poa* sp., *Hypericum* sp., *Fragaria* sp., Compositae, Gramineae.

[K5]

Mixed Coniferous Forest

[MF]

- **Altitudinal Range**: ≅1500 m.
- **Aspect**: South, South-East
- **Coverage**: Trees, Leaf Litter, Shrubs.
- **Vegetation**: *Pinus nigra*, *Abies cephalonica*, *Pteridium aquilinum*, *Fragaria* sp., Gramineae.

Neighboring Burnt and Non-Burnt Forest

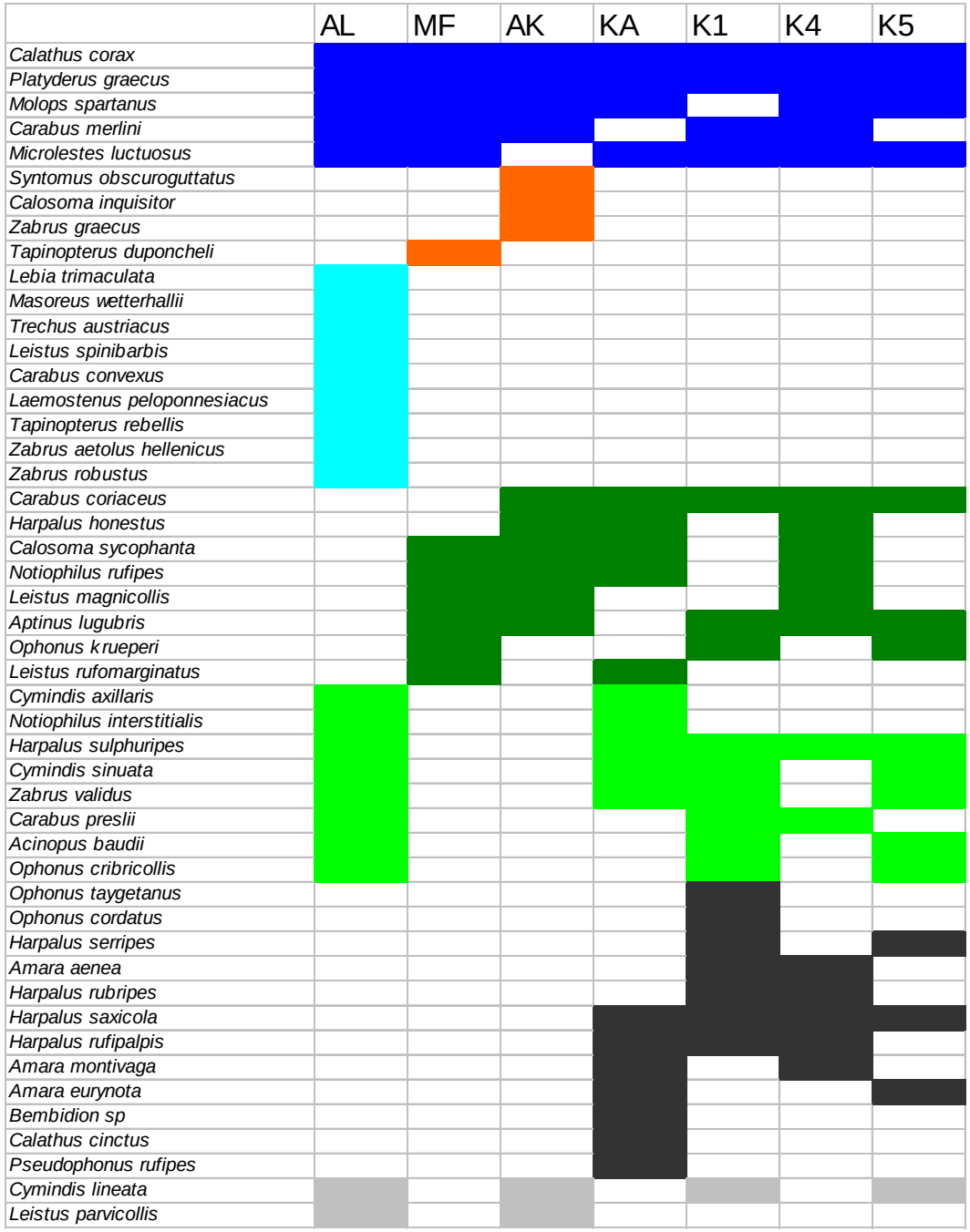
[KA]

- **Altitudinal Range**: ≅1400 m.
- **Aspect**: South-East
- **Coverage**: Shrubs, Rocks, Bare Soil, Logs.
- **Vegetation**: *Trifolium* sp., *Cerastium* sp., *Sonchus* sp., *Arabidopsis thaliana*, *Pteridium aquilinum*, Compositae.

[AK]

- **Altitudinal Range**: ≅1400 m.
- **Aspect**: North-West
- **Coverage**: Trees, Leaf Litter, Shrubs.
- **Vegetation**: *Pinus nigra*, *Pteridium aquilinum*.

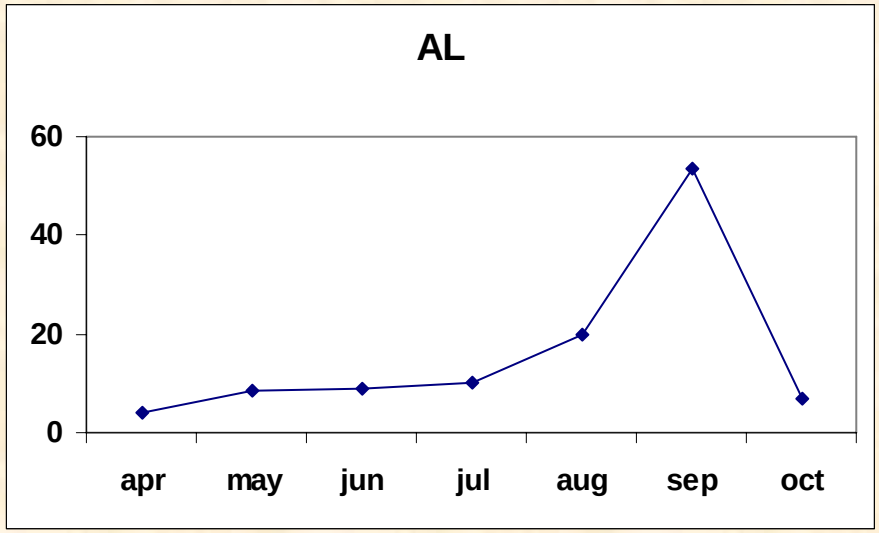
Presence of Carabidae Species per Biotope

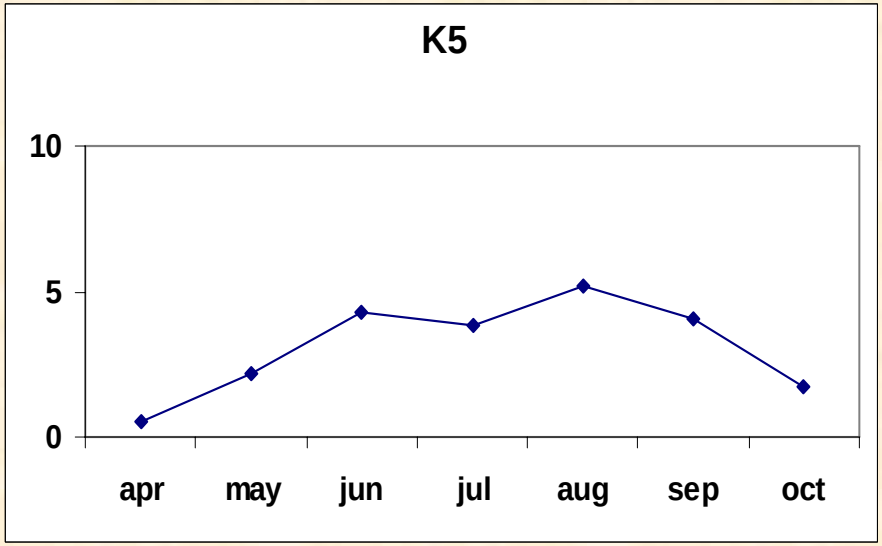


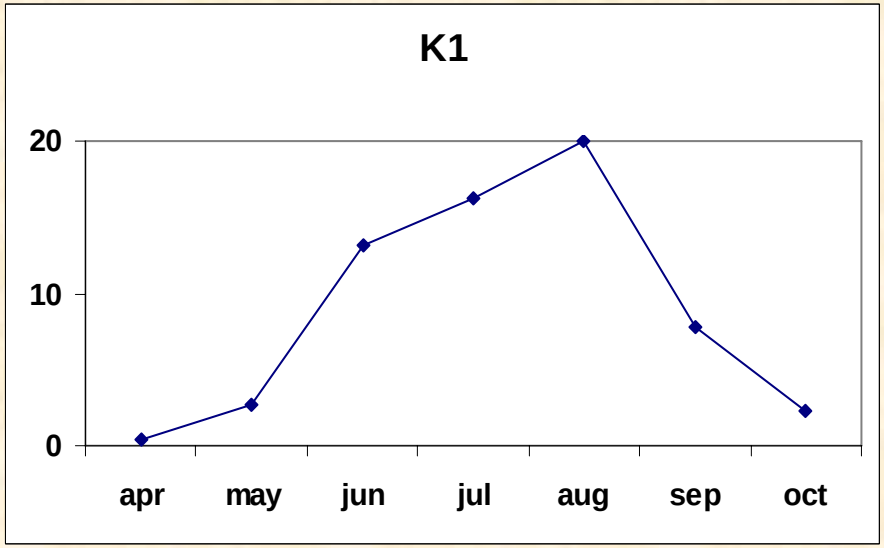
Legend

- **Widely Distributed**
- **Coniferous Forest**
- **Sub-Alpine**
- **Mainly in Forests**
- **Open Biotopes**
- **Burnt Biotopes**
- **Various**

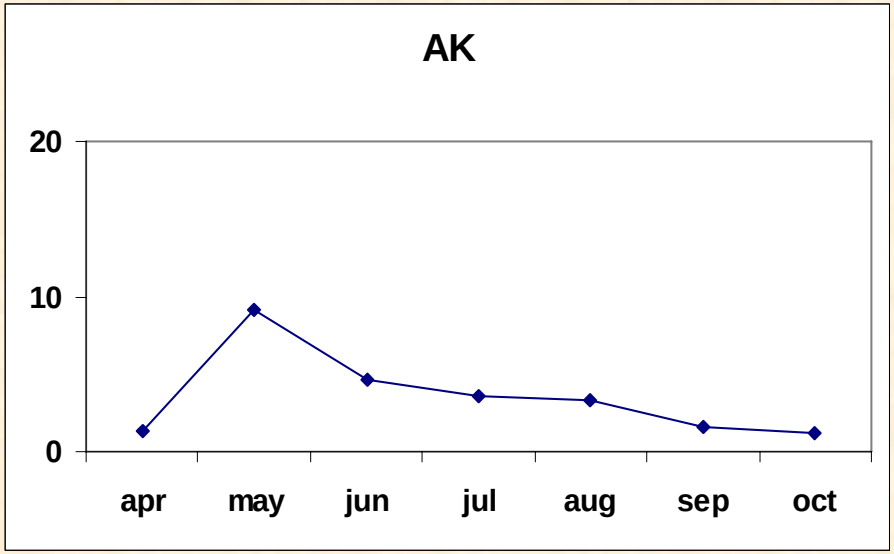
Carabidae abundance per month

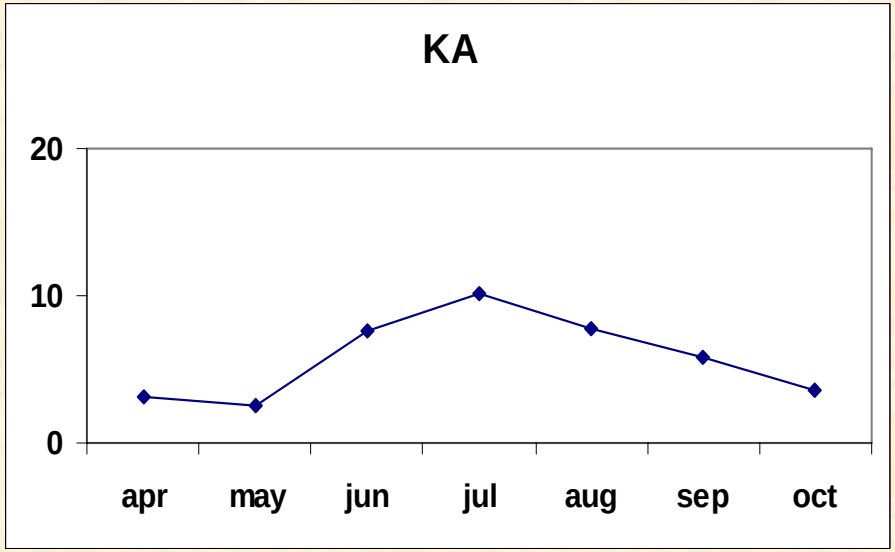


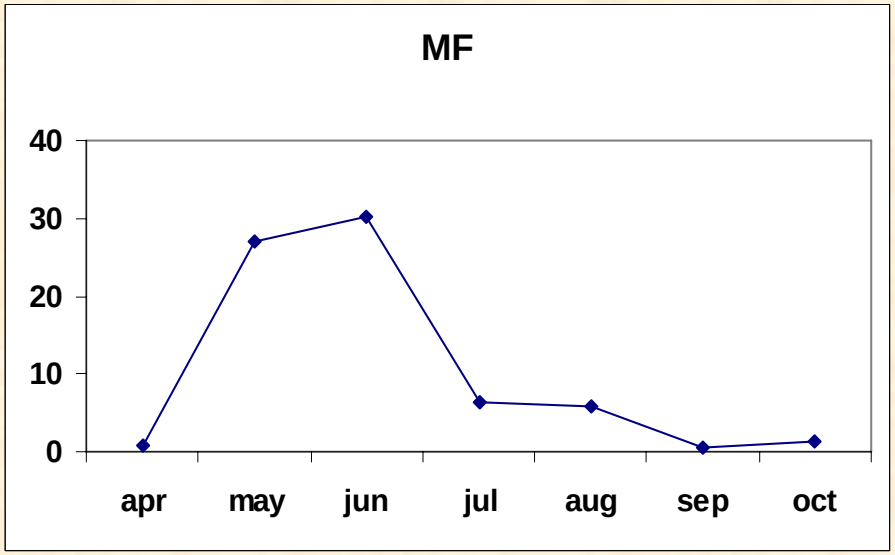


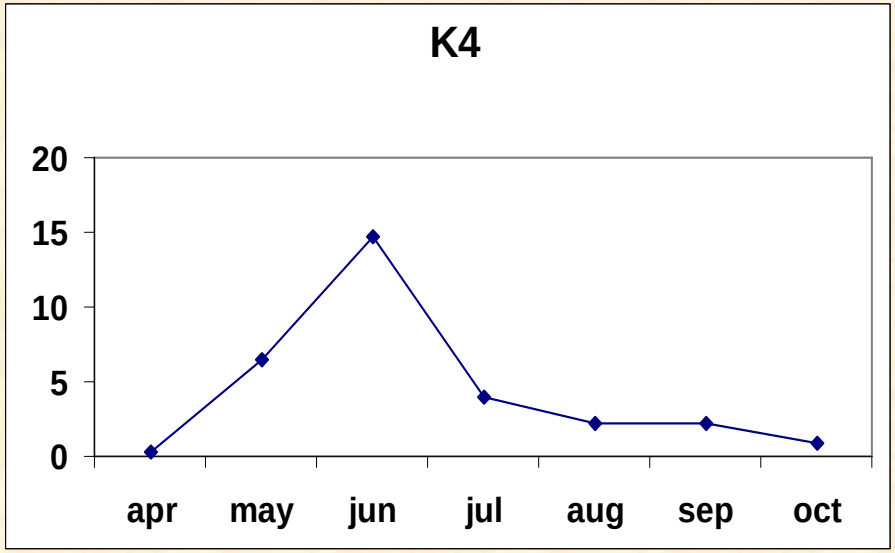


Carabidae abundance per month

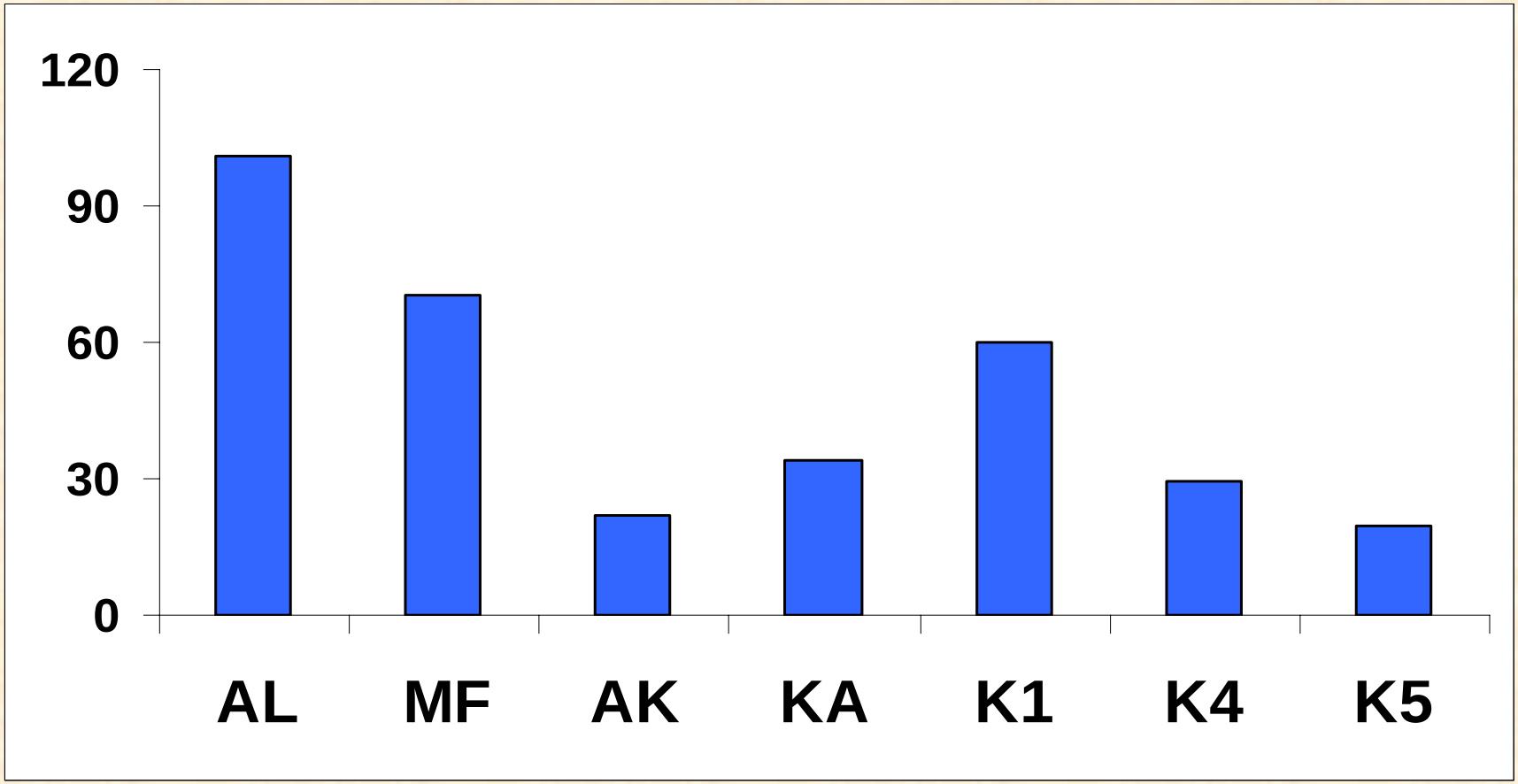




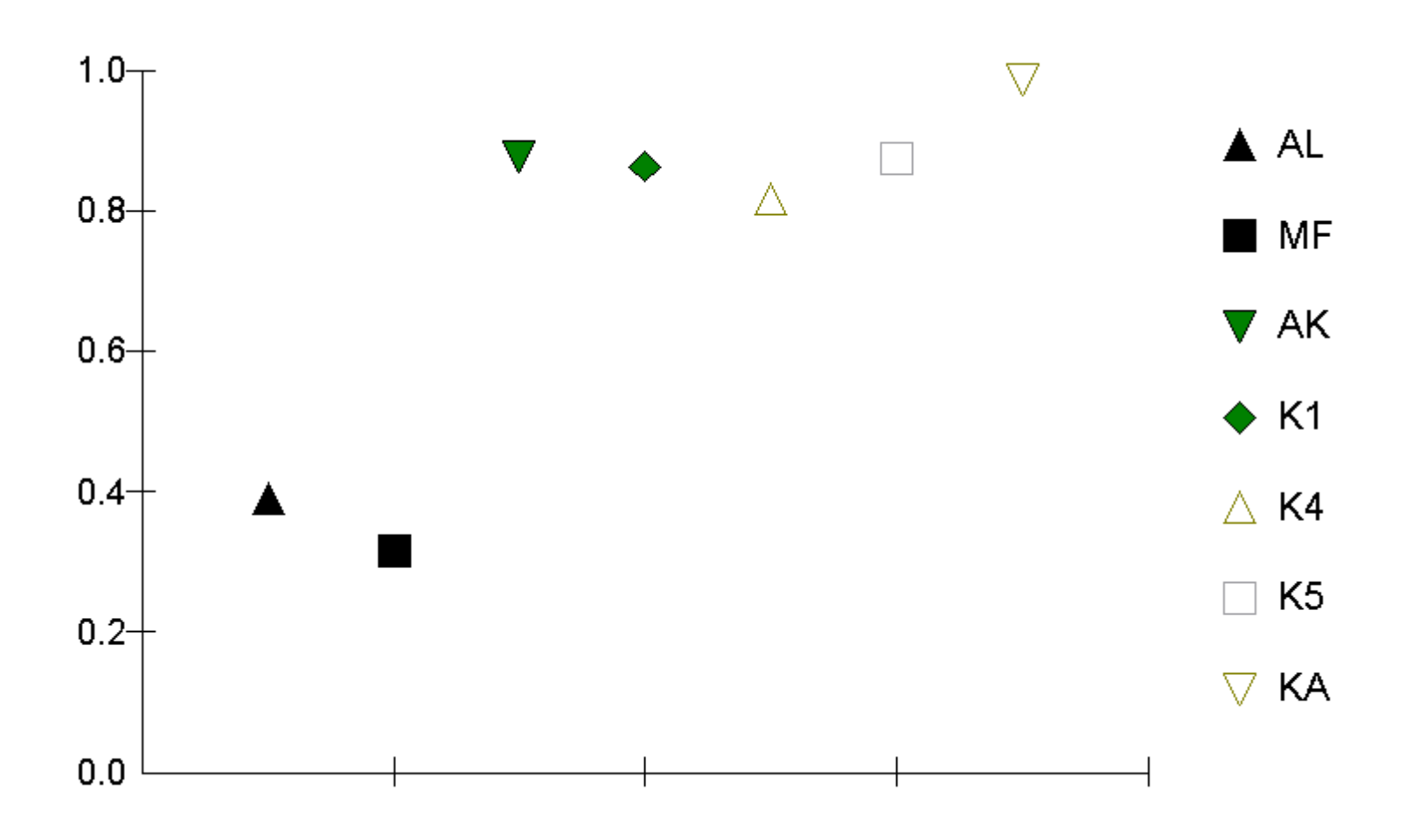




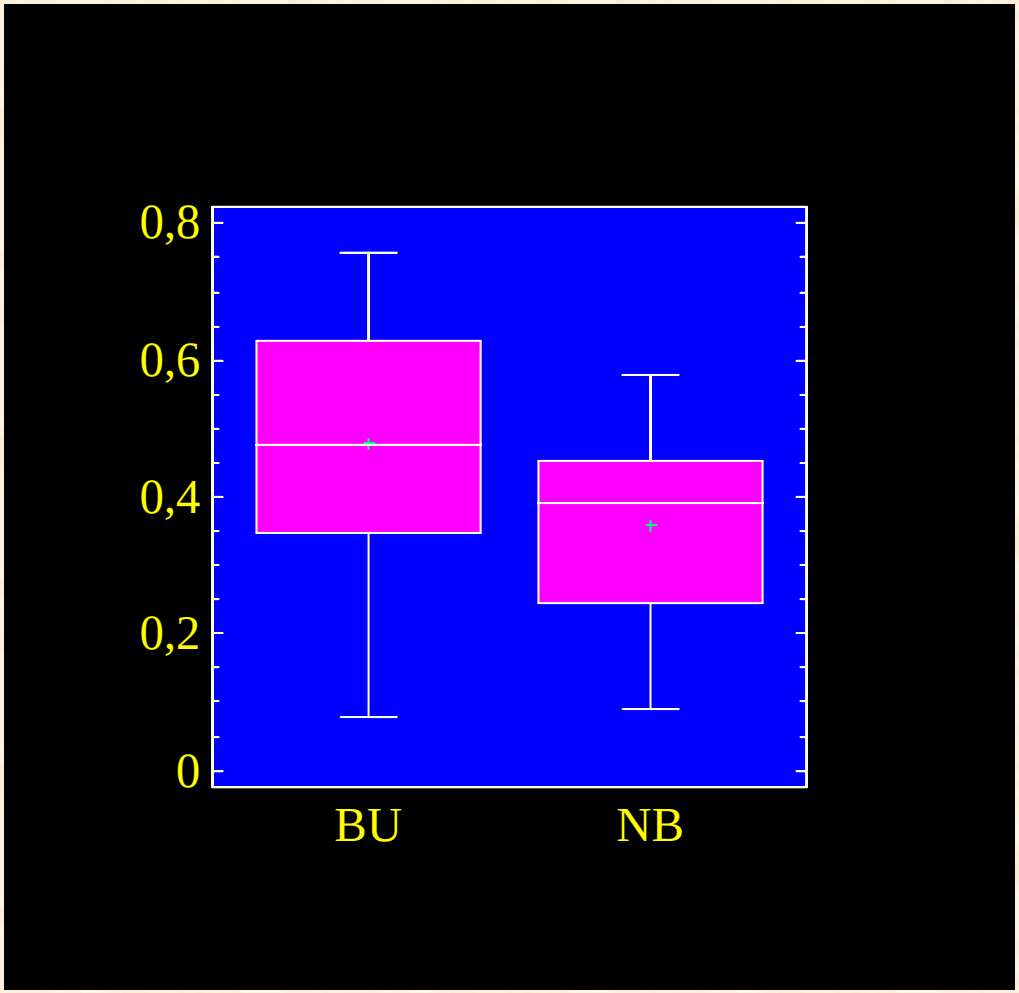
Carabidae abundance (pooled samples)



Carabidae diversity (pooled samples)

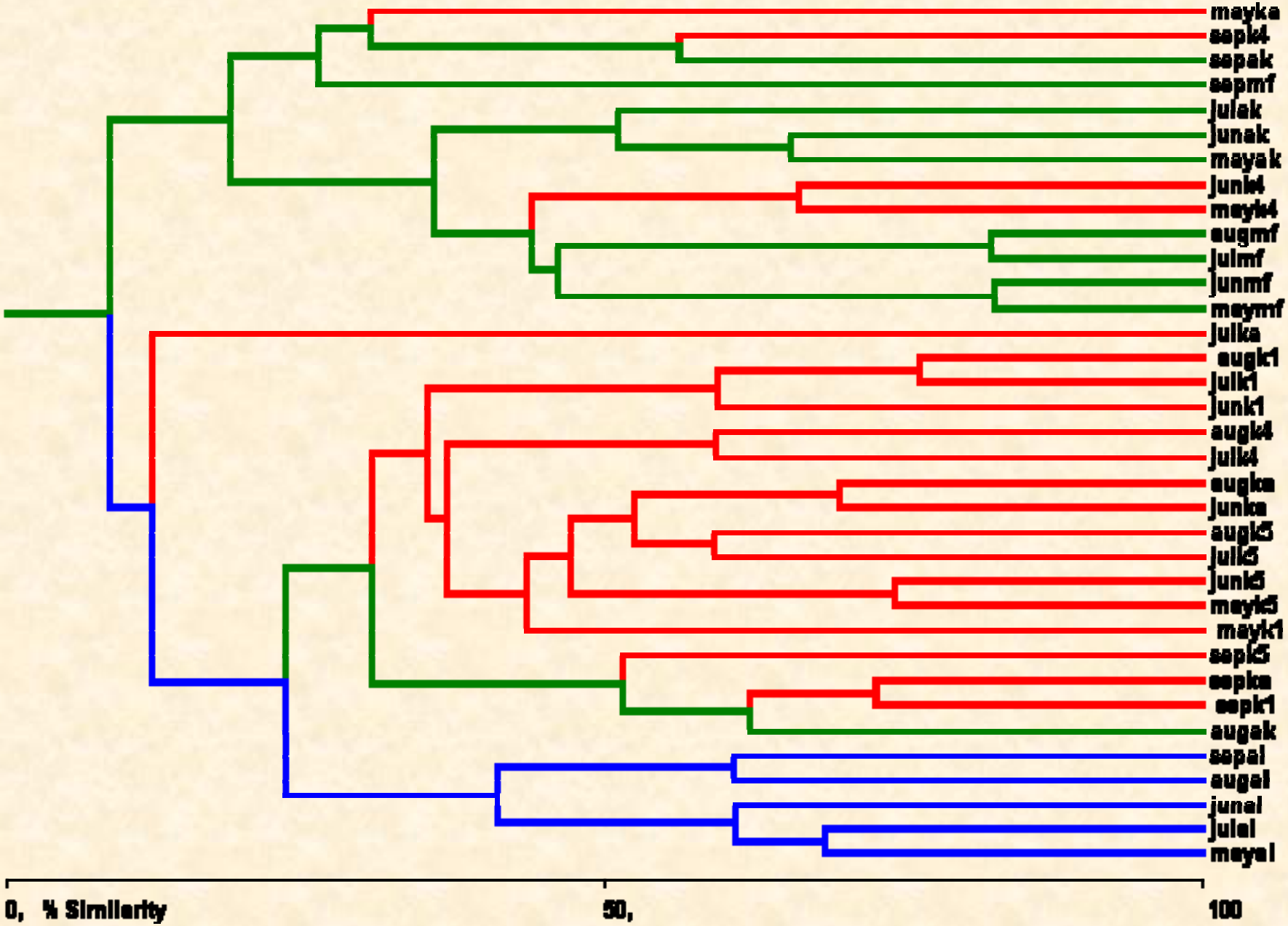


ANOVA of diversities (Shannon index)
CARABIDAE (June)

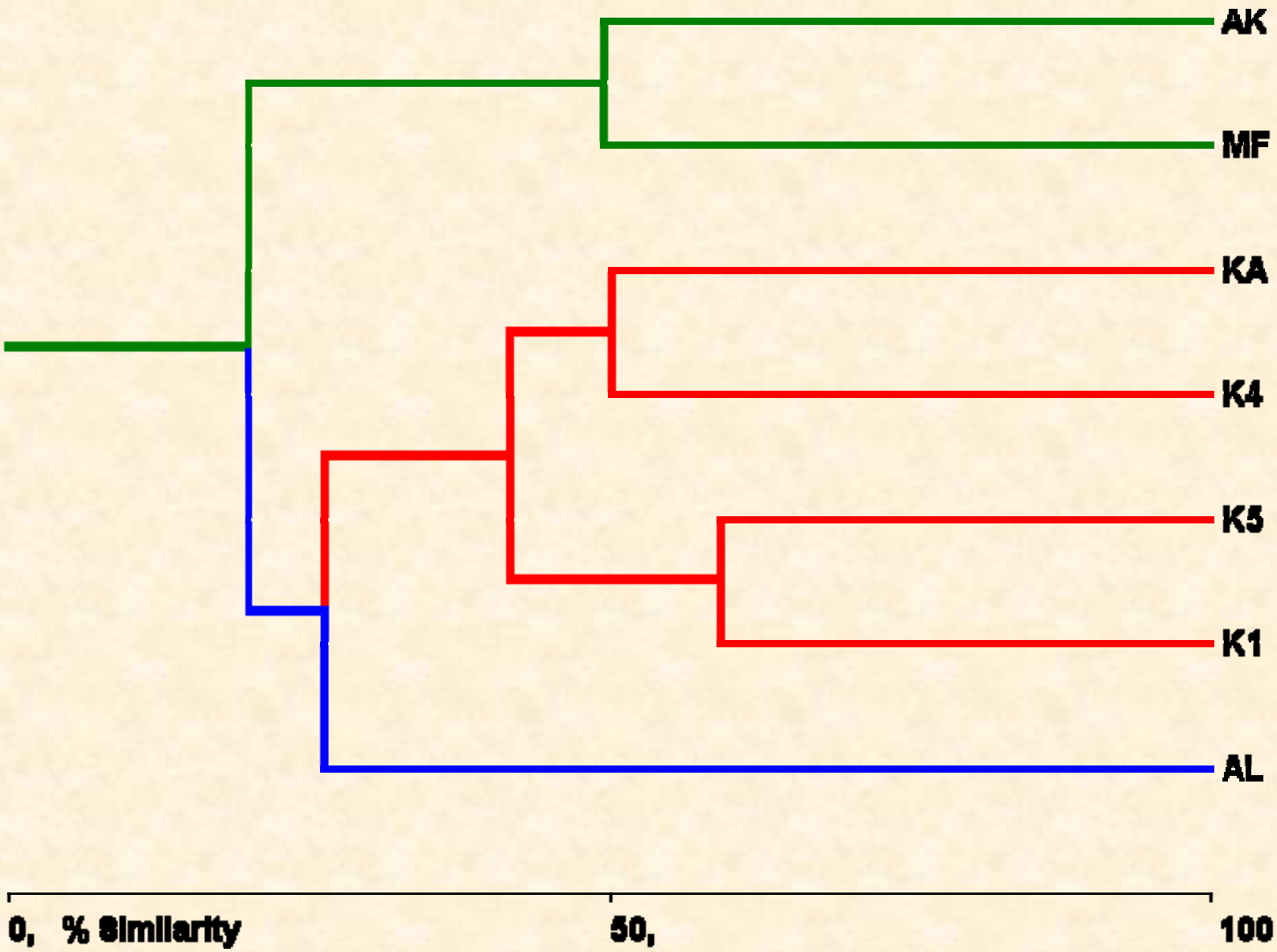


F = 5.52 P = 0.023

Carabidae (clustering of monthly samples)



Carabidae (pooled samples per station)



Presence of Tenebrionidae Species per Biotope

	AL	MF	AK	KA	K1	K4	K5
Laena sp B							
Cylindronotus tuberculiger							
Pedinus affinis alziari							
Stenosis orientalis							
Dendarus plicatulus							
Asida fairmairei							
Calyptopsis caraboides							
Dailognatha quadricollis							
Dendarus messenius							
Idastraniella taygetanus							
Nalassus graecus							
Pedinus fatuus							
Pedinus quadratus							
Pedinus subdepressus							
Pedinus taygetanus							

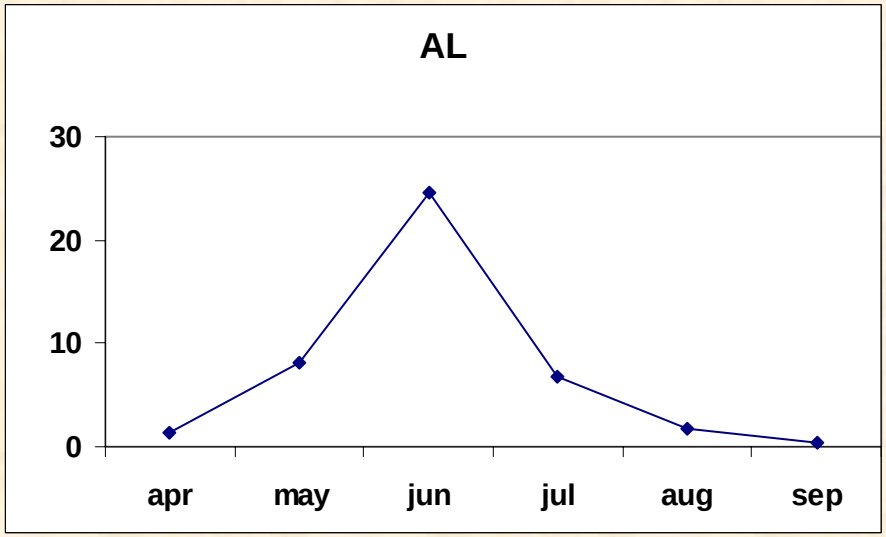
Legend

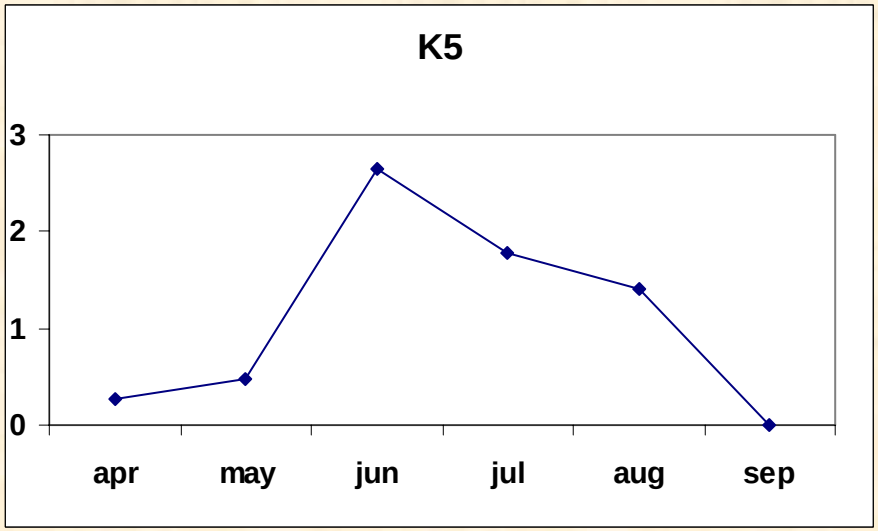
Widely Distributed

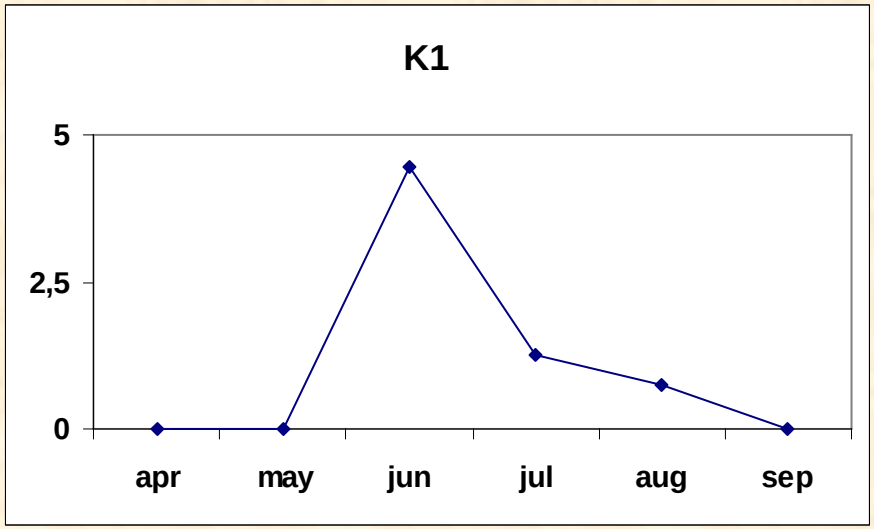
Sub-Alpine

Open Biotopes

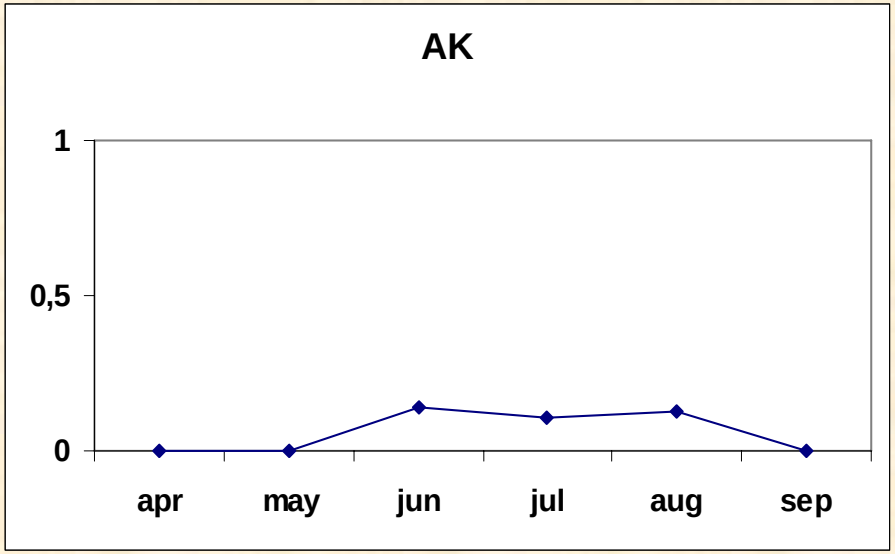
Tenebrionidae abundance per month

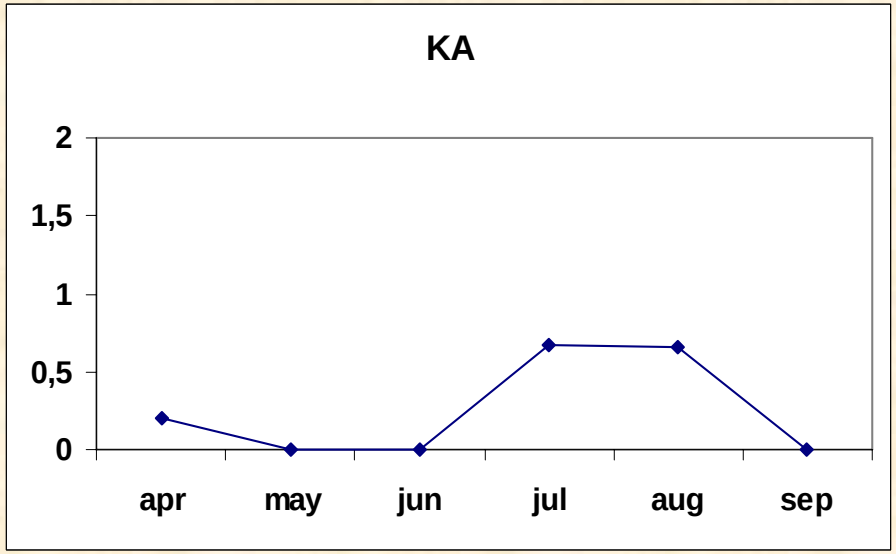


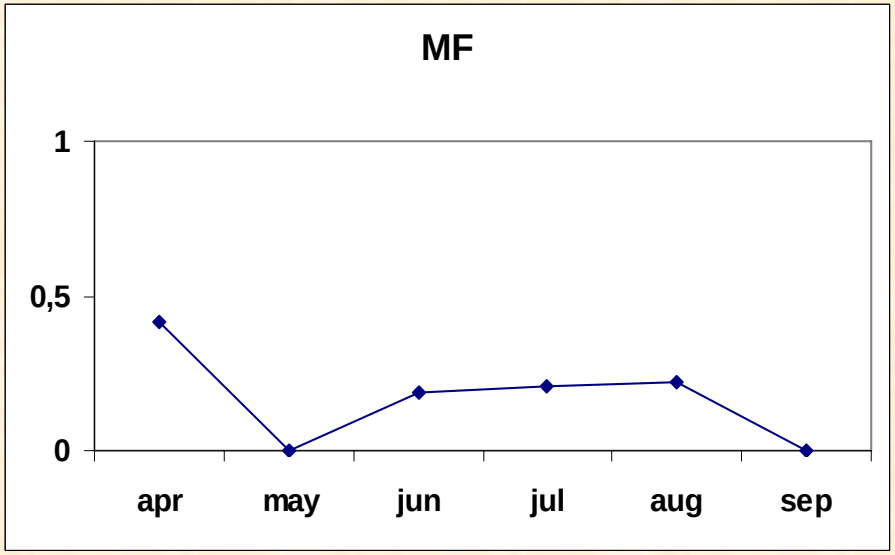


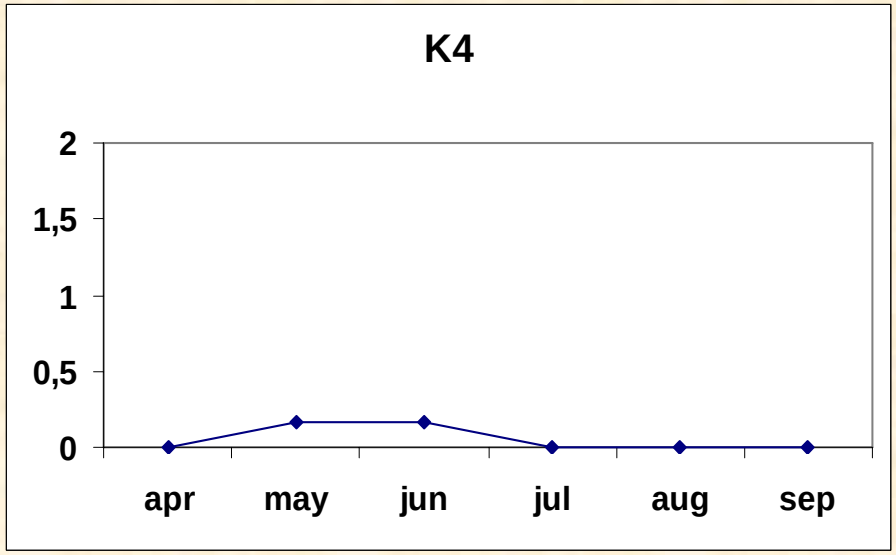


Tenebrionidae abundance per month

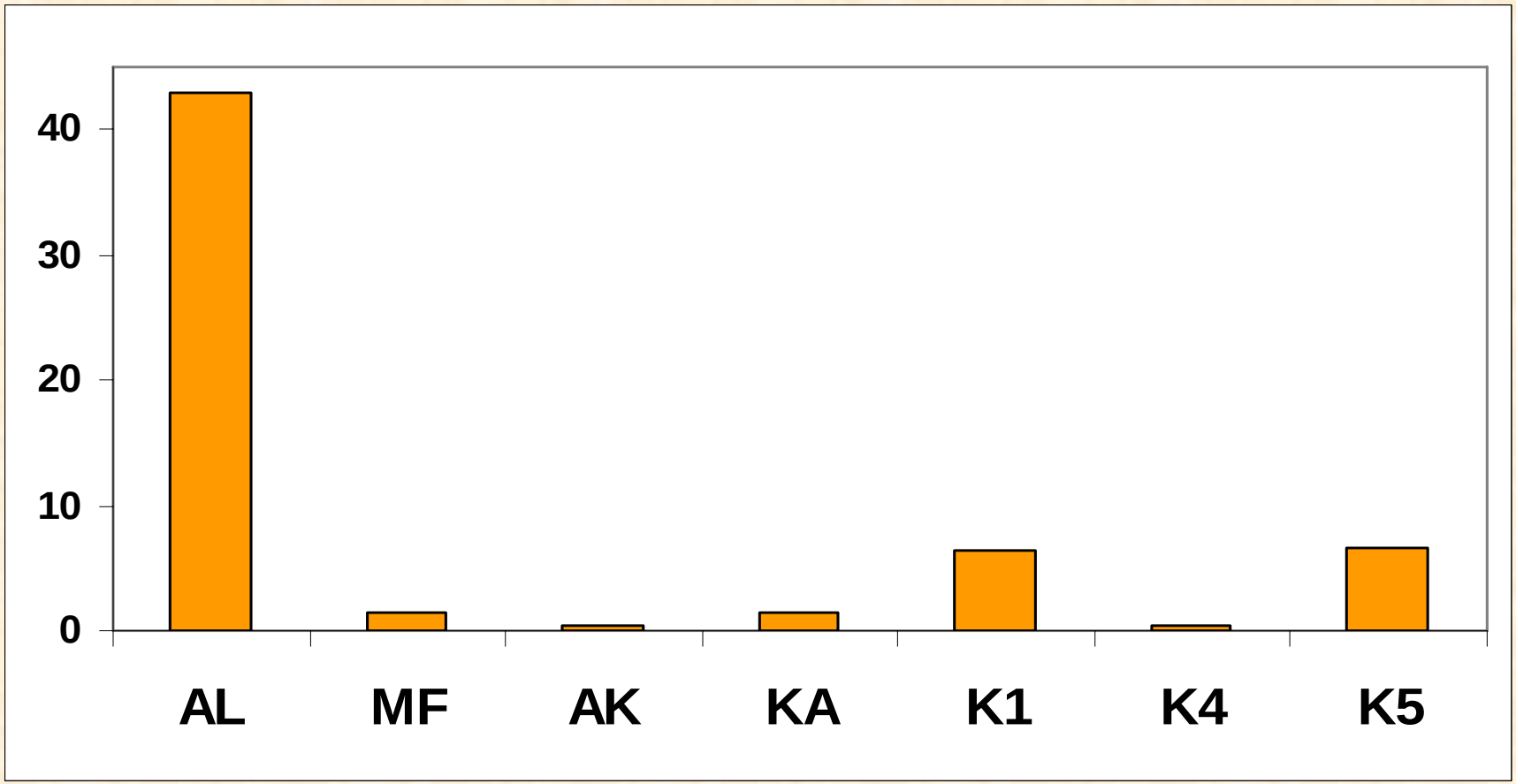




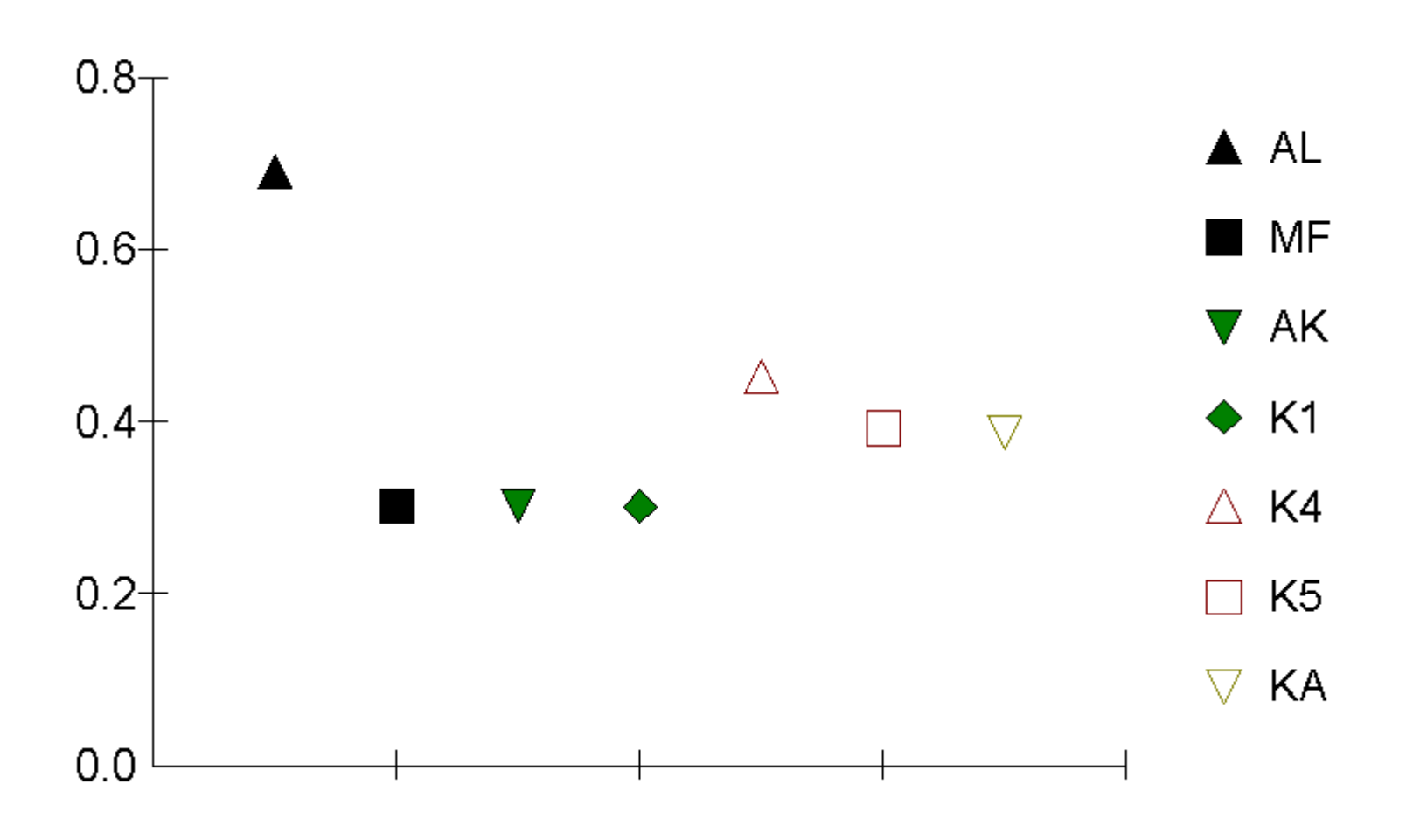




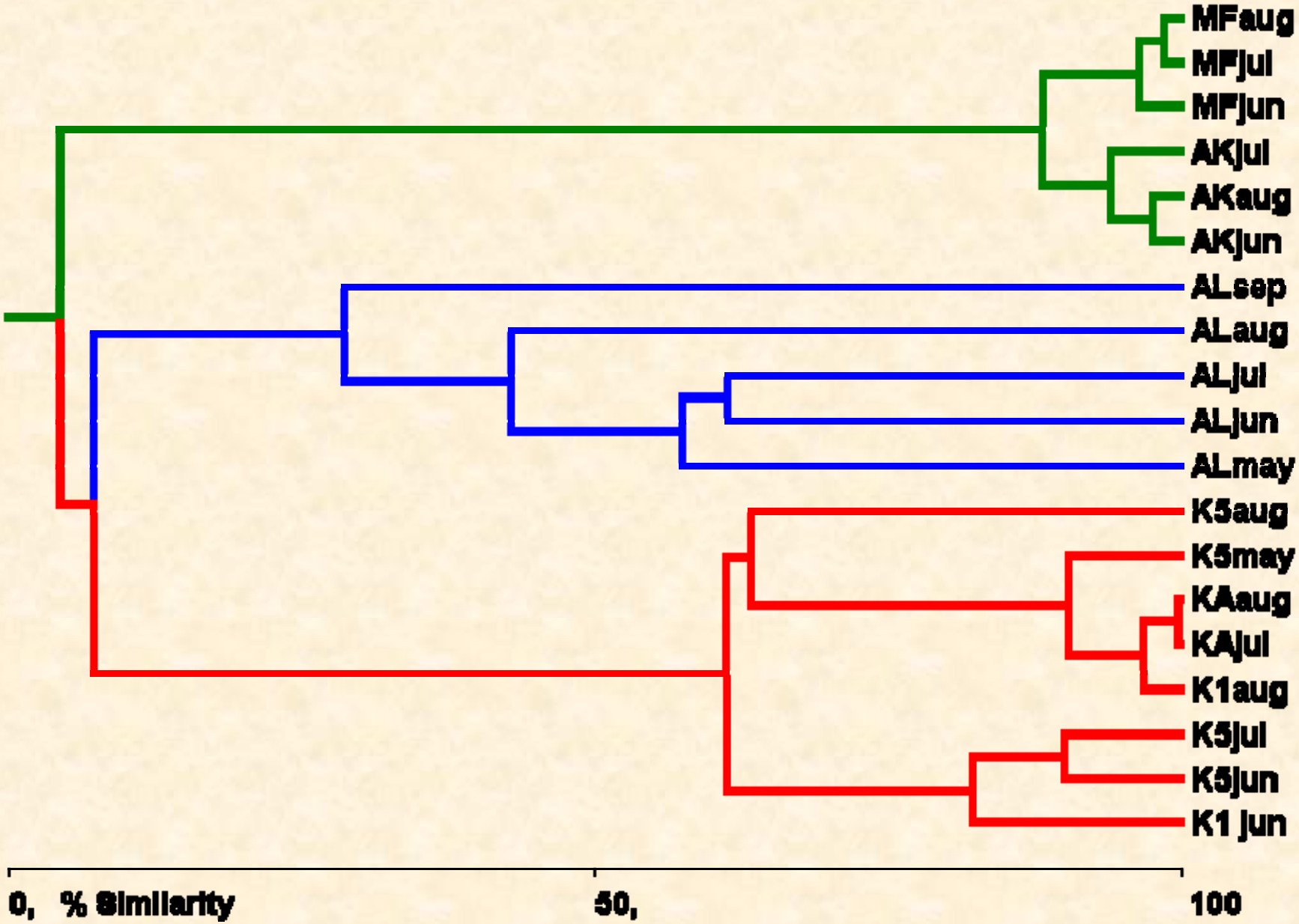
Tenebrionidae abundance (pooled samples)



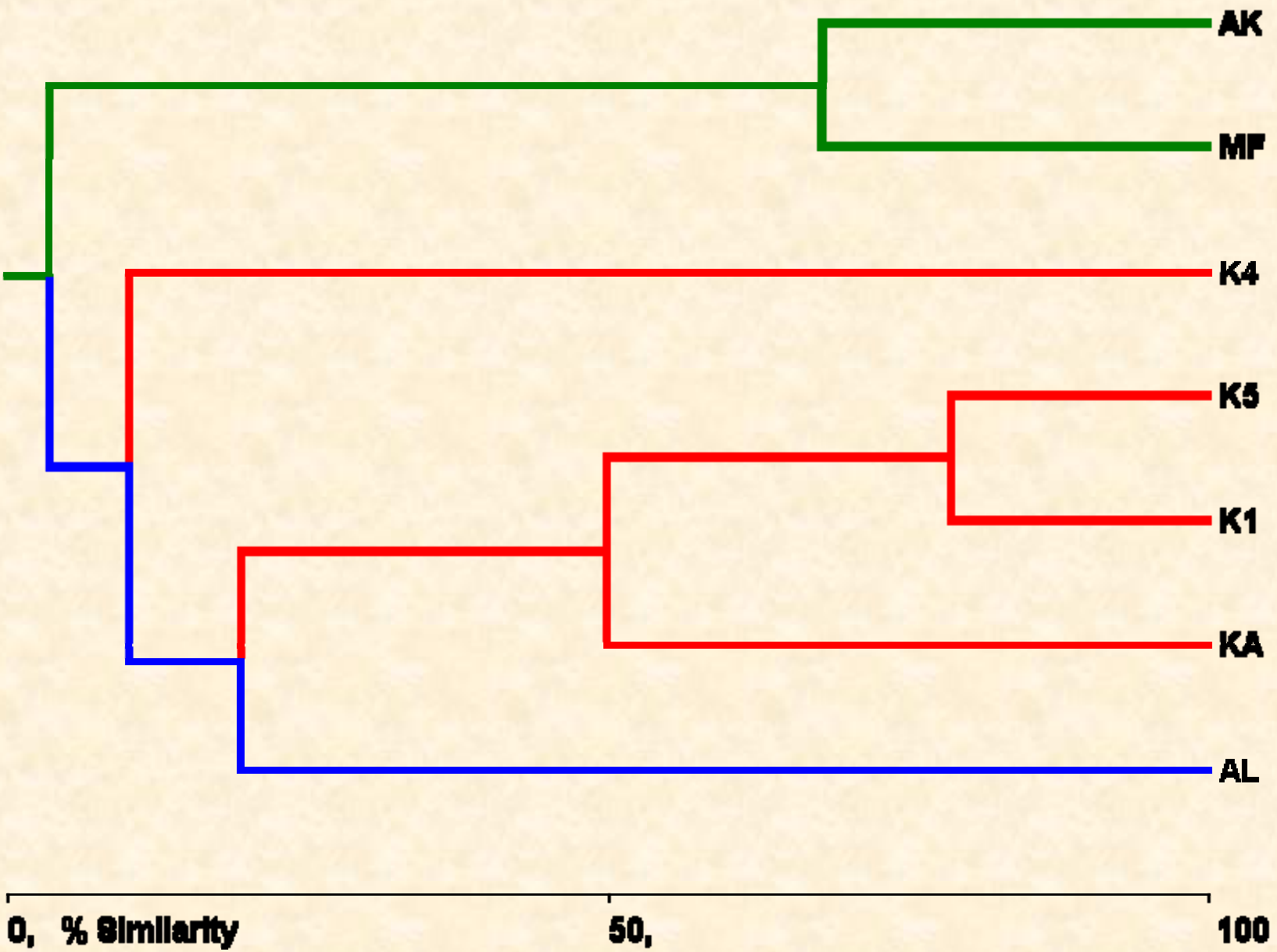
Tenebrionidae diversity (pooled samples)



Tenebrionidae (clustering of monthly samples)



Tenebrionidae (pooled samples per station)



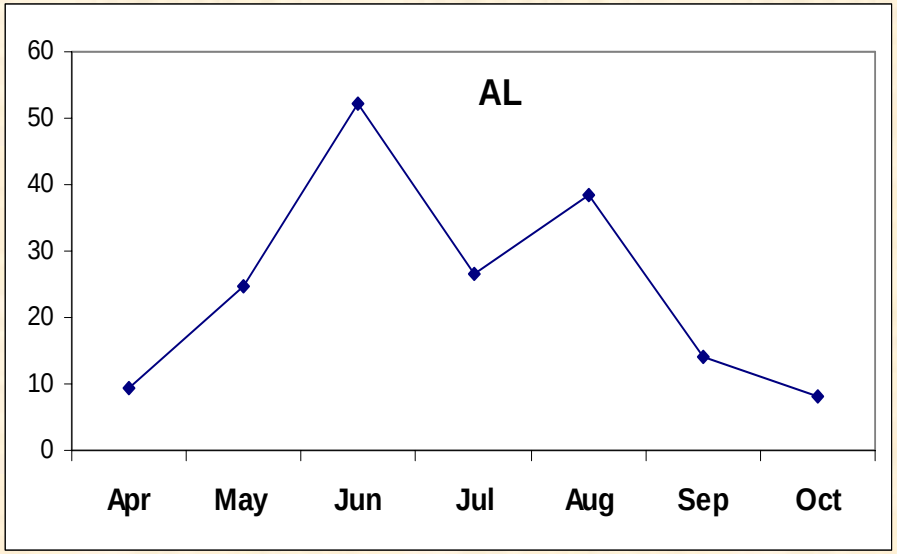
Presence of Isopoda per Biotope

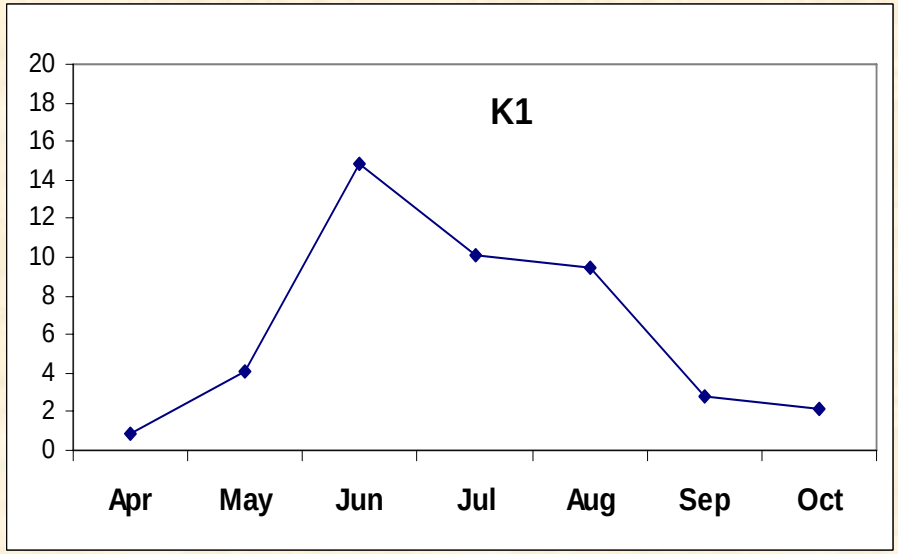
	AL	MF	AK	KA	K1	K4	K5
Armadillidium kalamatense							
Orthometopon dalmatinum							
Porcellio obsoletus							
Trichoniscus pusillus							
Porcellio peloponnesius							
Trachelipus palustris							
Ligidium euboicum							
Armadillidium tripolitzense							
Porcellionides pruinosus							

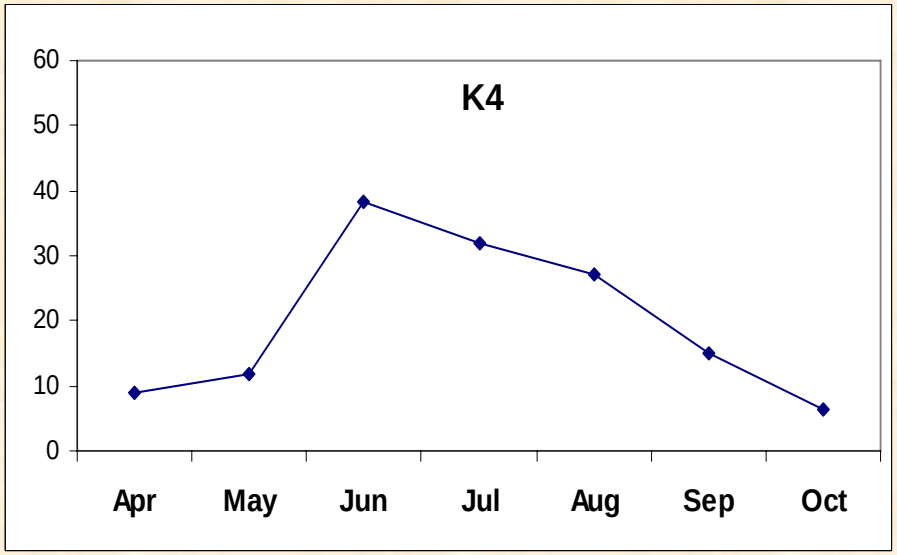
Legend

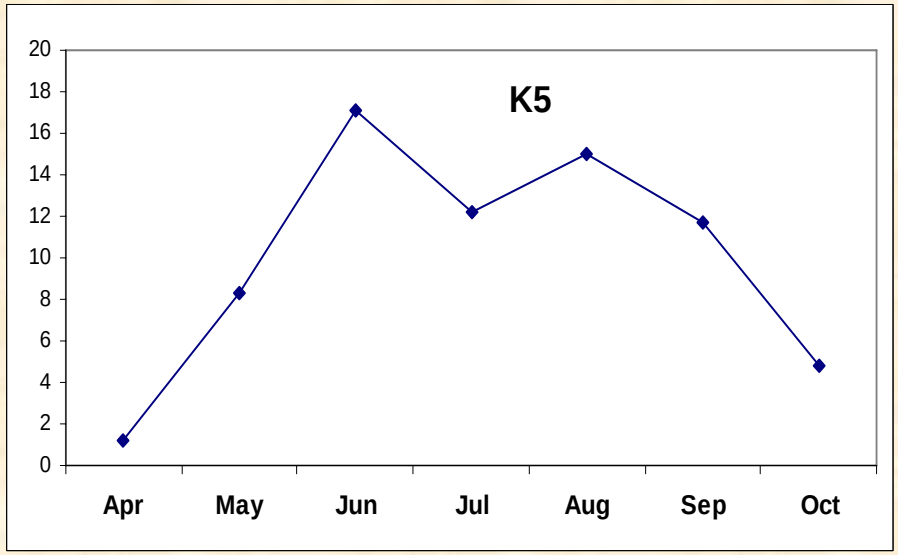
- Widely Distributed
- Coniferous Forest
- Mainly in Forests
- Open Biotopes
- Burnt Biotopes

Isopoda abundance per month

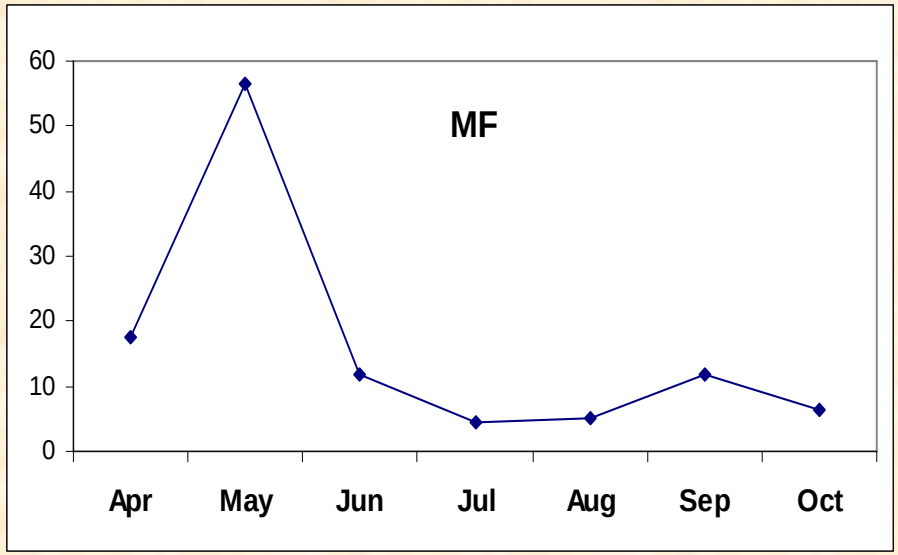


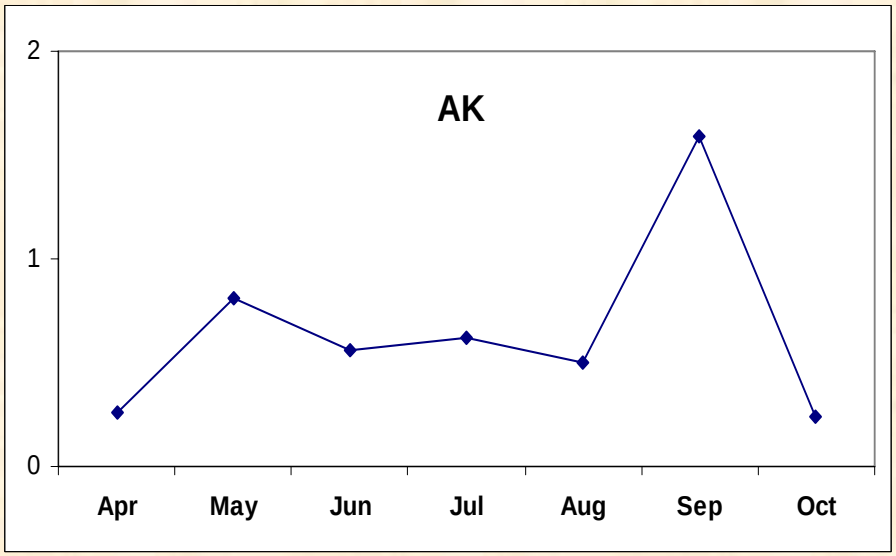


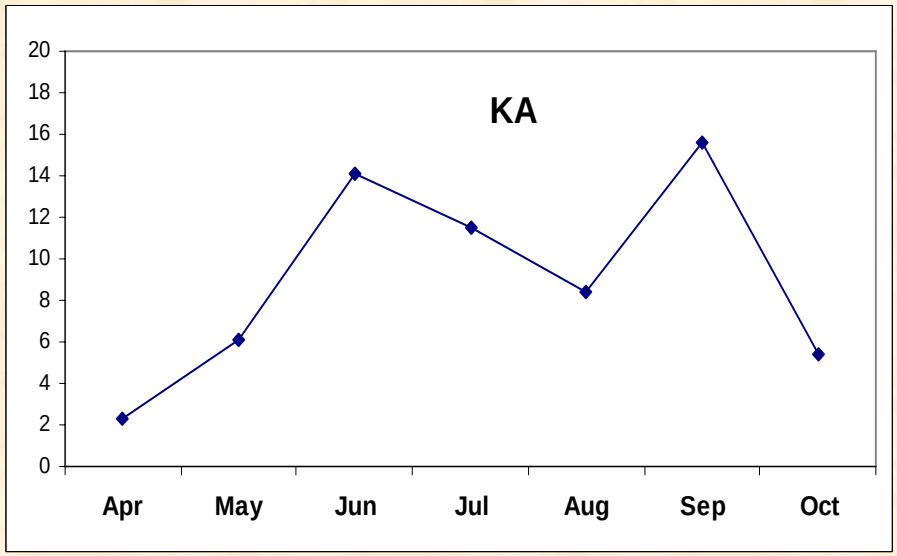




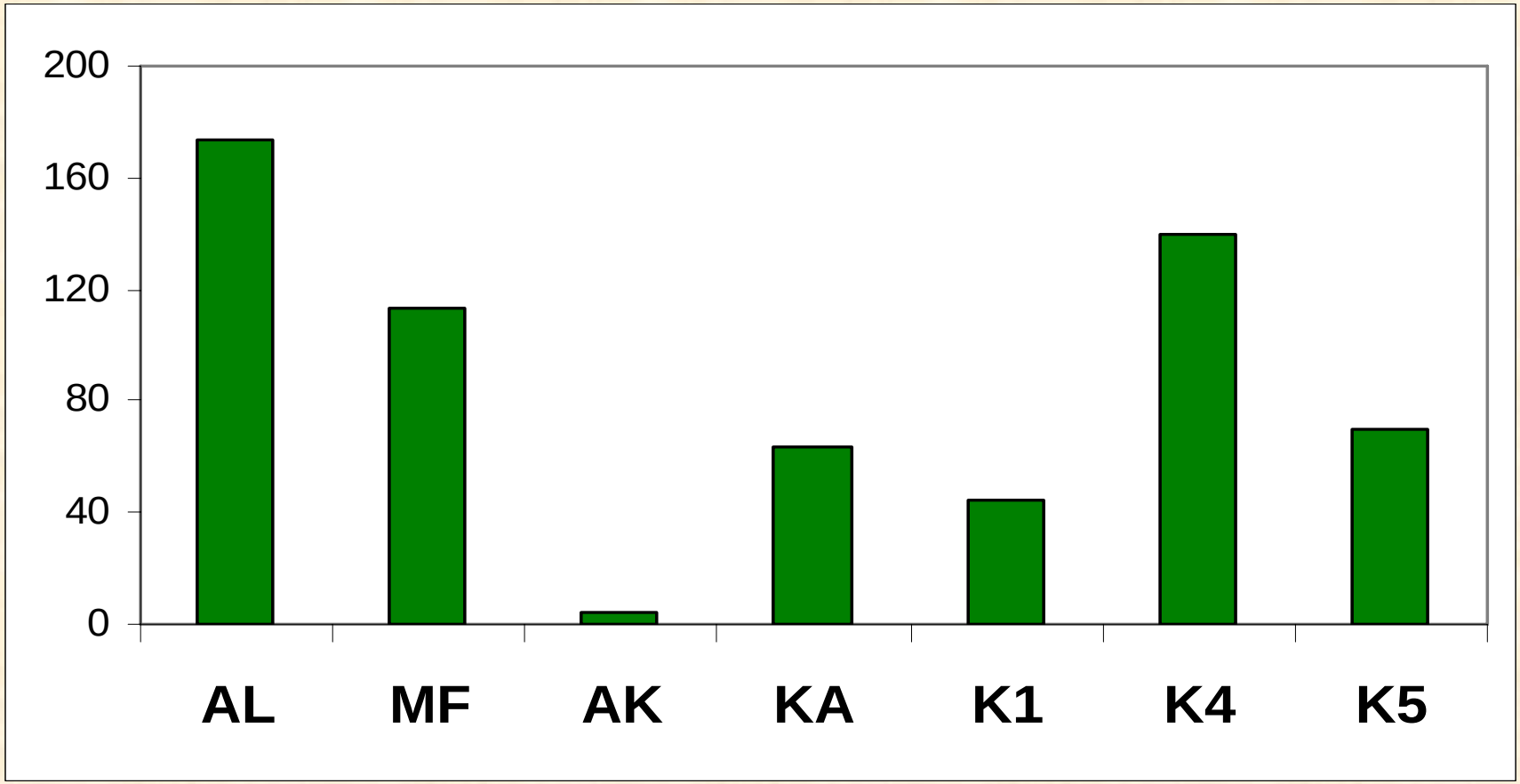
Isopoda abundance per month



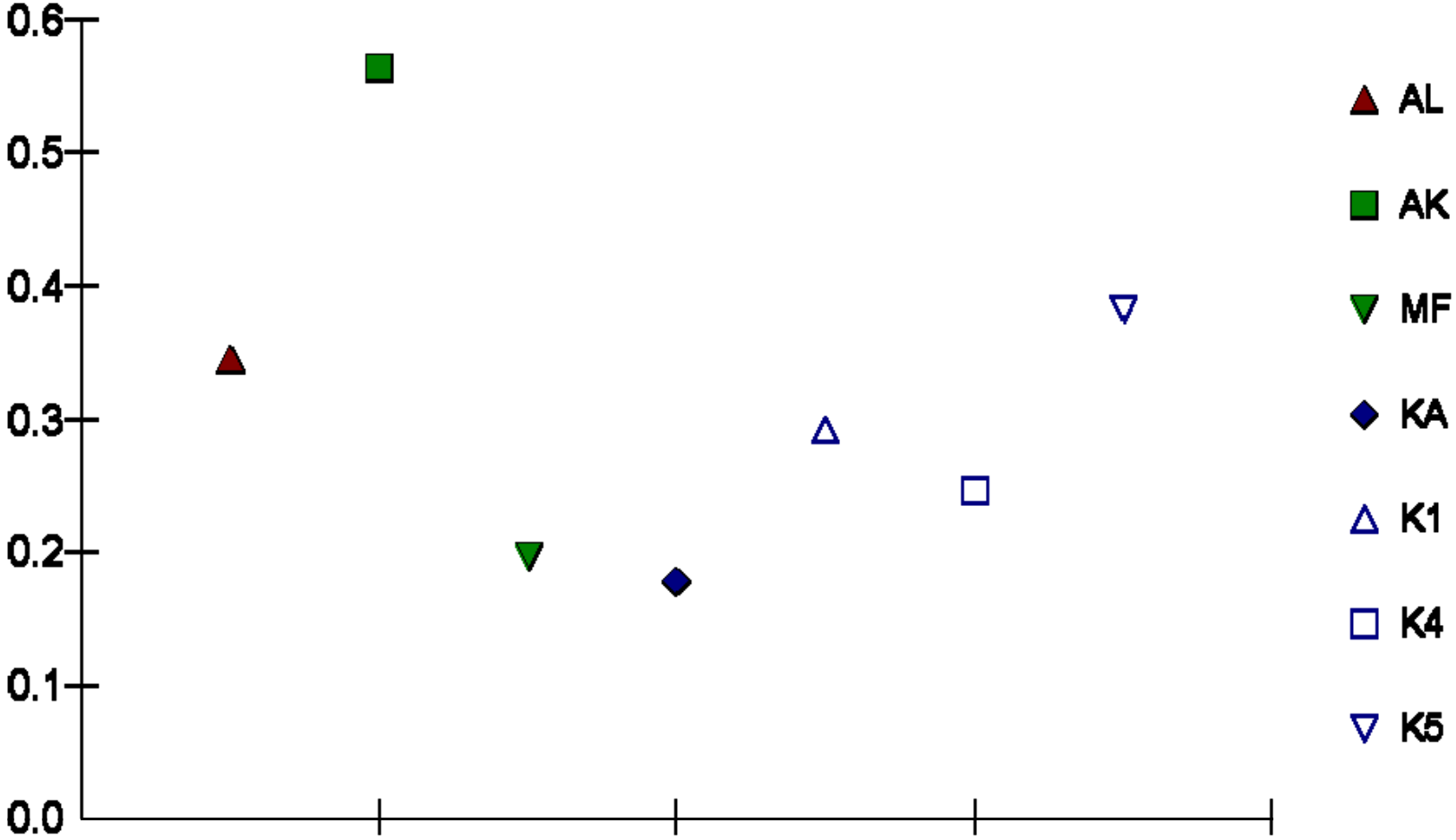




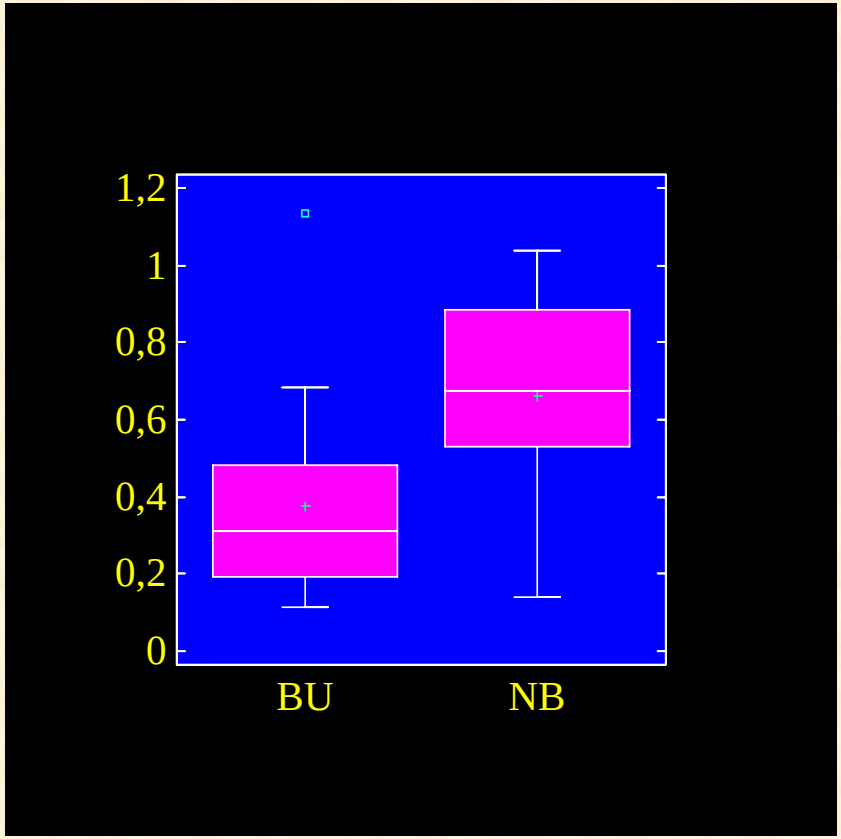
Isopoda abundance (pooled samples)



Isopoda diversity (pooled samples)

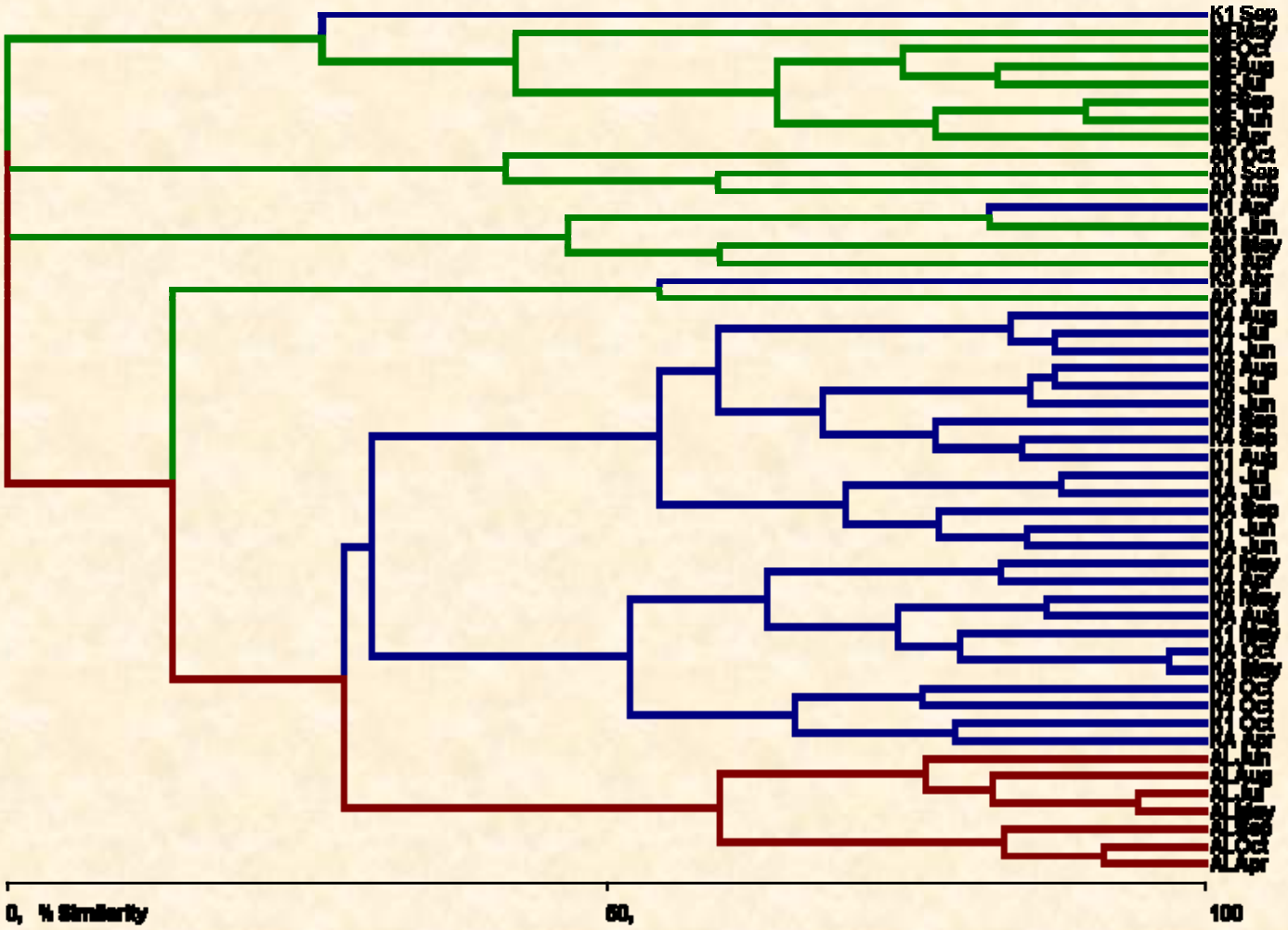


ANOVA of diversities (Shannon index)
ISOPODA (June)

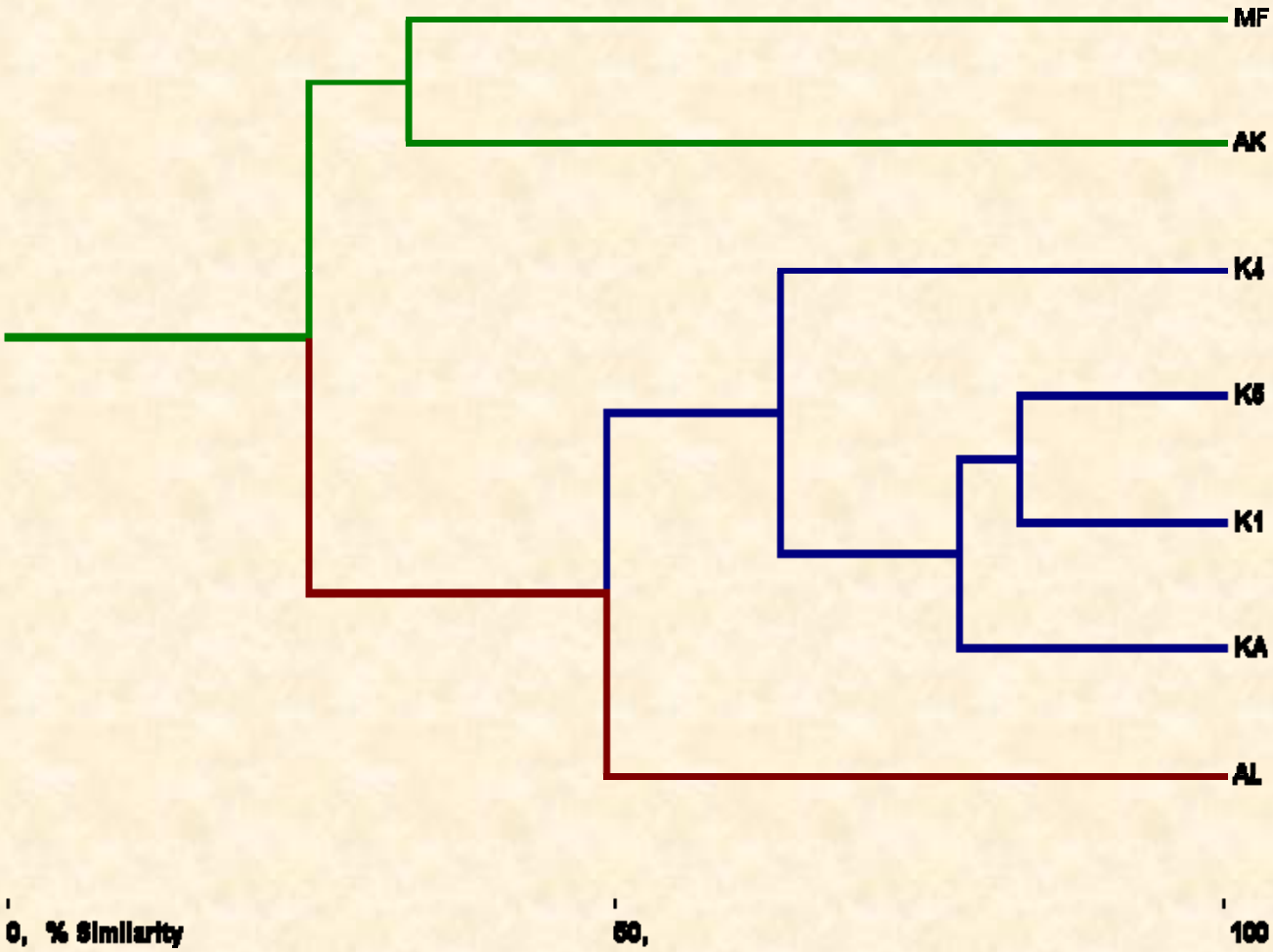


F = 6,55 P = 0,017

Isopoda (clustering of monthly samples)



Isopoda (pooled samples per station)



Conclusions

- Highest abundance in sub-alpine habitat
- The pine forest has the lowest abundance
- Burnt habitats are not poorer than non-burnt
- Burnt habitats are generally more diverse than non-burnt (except for the sub-alpine habitat)
- The three groups analyzed herein do not show particularly consistent diversity patterns
- Open habitats (sub-alpine and burnt) are more similar in community structure
- The markedly increased diversity of (the carnivorous) Carabidae in burnt habitats might be due to species coming from other habitats to opportunistically exploit available resources

Fire does not seem to have significant short- and medium-termed effects on the epigeic invertebrate communities we studied

So, let them burn ?

We must note that there were almost no post-fire human activities in these habitats

ACKNOWLEDGEMENTS

We wish to thank the following colleagues for their assistance during the project:

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