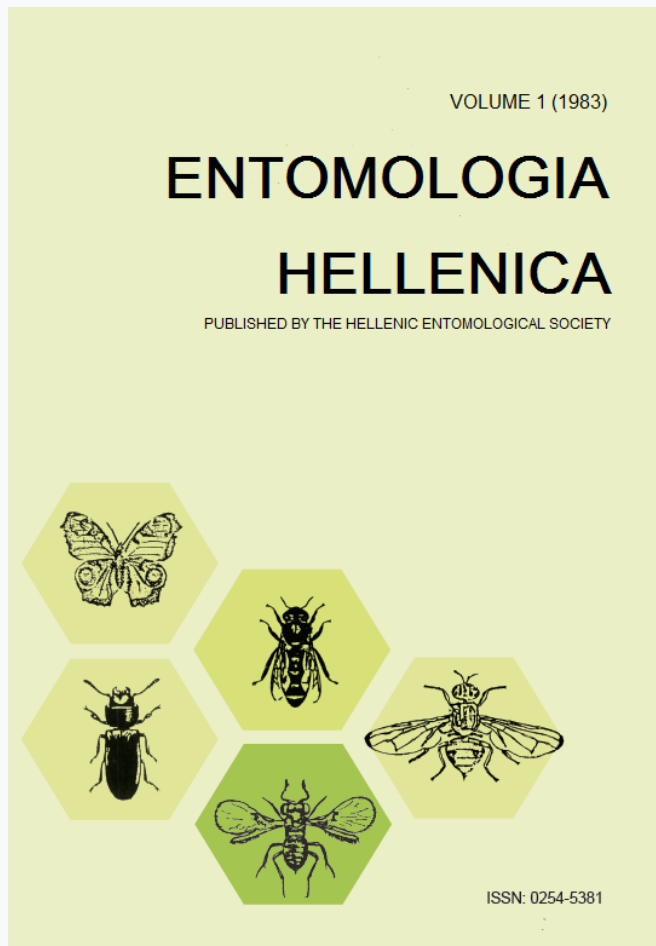


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# First Contribution to the Study of the Ants (Hymenoptera, Formicidae) of the Zagori Region (Epirus, Greece): an Annotated List of Species<sup>1</sup>

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## ABSTRACT

The paper contains records of 33 ant species collected in the Zagori region of North-western Greece in 1979 and 1981. These are the first records of ants from this region. Some notes on their morphology and ecology are included. An analysis of the general distribution of the species shows that the influence of the Mediterranean, South European, Asiatic and Pontic elements is approximately equal. For some species the region is the southernmost limit in the Balkans. Seven species were observed only over 1000m, while three of them were observed only over 1400m. Most species are either insectivores or omnivores. Omnivores and species with Mediterranean or South European distribution predominate in or near human settlements.

## Introduction

Zagori is a mountainous region of Epirus in the northwestern part of Greece, situated between the towns of Jannina, Metsovo and Konitsa. The region is surrounded by high mountains belonging to the Pindos range, highest of which are Smolikas (2637m) in the north and Gamila (2497m) in the west.

The region offers a variety of climatic and pedological conditions. As a consequence, its fauna and flora are very rich and quite different from that of Southern Greece having more similarities with that of the Central and Western Balkans. The dominating forests include Austrian pine (*Pinus nigra*) and beech (*Fagus sylvatica*) as well as Bosnian pine (*P. heldreichii*), King Boris' fir (*Abies borisii*), Grecian fir (*A. cephalonica*) and others (Sfikas 1981).

The fauna of Zagori is very rich but apart from the large mammals (*Ursus arctos*, *Rupicapra rupicapra*, *Capreolus capreolus*, *Lutra lutra*, *Felis silvestris*, *Canis lupus*, *Sus*

*scrofa*), the birds (various eagle and vulture species) and the fish (*Salmo trutta*), very little is known about the presence of lower taxa such as insects (Sfikas 1981). This paper deals with one insect group, the family Formicidae -ants- which has been very little studied in Greece (Legakis 1981). As a matter of fact, there are no records of ants from the whole northwestern part of Greece. Because of this and also because of the importance of the region as far as the fauna and flora are concerned, a systematic search was carried out in order to fill the gaps in the knowledge of this area.

## Materials and Methods

Five collecting trips were carried out during 1979 and 1981 in the Zagori region. Almost all important biotopes of the region were visited in low and high altitudes, in river banks, various types of forests, cultivated and abandoned land, maquis, phrygana etc. Specimens were kept in 96 % ethanol and identified in the laboratory by the author. The basic identification keys used were those of Bernard (1968), Emery (1908-1912) and Müller (1923). Identifications were made using workers and also sexuals whenever possible. Distribution and feeding habits were obtained from Baroni-Urbani (1971) and

<sup>1</sup> Received for publication December 7, 1981.

Bernard (1968). The specimens are kept in the personal collection of the author.

The abbreviations used for the localities are as follows:

Aoos-K: Aoos river near Konitsa  
 Aoos-Vris: Aoos riv. near Vrissohori  
 Dil: Dilofo  
 Grev: Greveniti  
 Gyft: Gyftokambos  
 Kap: Kapesovo  
 Kip: Kipoi  
 Neg: Negades  
 Tsep: Tsepelovo  
 Vik: Vikos gorge  
 Void: Voidomatis riv. near Konitsa  
 Vris a: Vrissohori 700m  
 Vris b: Vrissohori 1000m  
 Vris c: Vrissohori 1400m

### Results

There follows a list of the species identified with some notes on their ecology and morphology.

#### PONERINAE

*Ponera coarctata* (Latreille 1802): Vris a, 2 ♀; Vris c, 28.V.81, 5 ♀. In both localities, a few workers were discovered under stones inside a mixed forest. Insectivorous. Eurasiatic distr.

#### MYRMICINAE

*Myrmica sabuleti* Meinert 1861: Neg, 25.IX.79, ♀♀; Grev, 20.IV.81, 1 ♀; Gyft, 21.IX.81, 8 ♀. Insectivorous. European distr.

*Myrmica ruginodis* Nylander 1846: Vris c, 28.V.81, ♀♀. Nests under stones with numerous workers in a mixed beech-pine forest. Insectivorous. Eurasiatic distr.

*Aphaenogaster simonelli balcanica* Emery 1894: Dil, 25.IX.79, ♀♀, 1♂; Vik, 26.IX.79, 5 ♀, 2♂; Kip, 15.IV.81, 1 ♀. Very common. Nests with open entrances. Insectivorous. Mediterranean distr.

*Aphaenogaster subterranea* (Latreille 1798): Aoos-K, 18.IV.81, 3 ♀; Grev, 20.IV.81, 4 ♀; Vris a, 27.V.81, 6 ♀. Nests under stones with numerous workers. Insectivorous. S. European distr.

*Aphaenogaster ovaticeps* (Emery 1898): Tsep, 26.V.81, 1 ♀. Insectivorous. Mediterranean distr.

*Messor rufitarsis* (F. 1804): Neg, 25.IX.79, 1 ♀, 1♂; Kip, 15.IV.81, 2 ♀; Aoos-K, 18.IV.81, ♀♀; Void, 18.IV.81, 6 ♀; Grev, 20.IV.81, 4 ♀; Vris b, 26.V.81, 6 ♀; Aoos-

Vris, 26.V.81, 10 ♀; Kap, 4.VIII.81, 7♀. Very common. Granivorous. Pontomediterranean distr.

*Pheidole pallidula* (Nylander 1848): Neg, 25.IX.79, ♀♀; Aoos-K, 18.IV.81, 1 ♀, 29.V.81, 1 ♀, 4 ♀; Grev, 20.IV.81, 1 ♀; Aoos-Vris, 26.V.81, 3 ♀, 2 ♀; Vris a, 27.V.81, 2 ♀, 1 ♀. Very common with nests with numerous workers. Worker and soldier colouration ranging from yellowish brown to dark brown in the same nest. Omnivorous. Mediterranean distr.

*Cremastogaster scutellaris ionia* Forel 1911: Vik, 26.IX.79, 1 ♀, 1♂; Aoos-K, 18.IV.81, 1 ♀, 29.V.81, 3 ♀; Tsep, 26.V.81, 1 ♀; Kap, 4.VIII.81, 1 ♀. Very common. Nests on trees. Body colouration brown yellow. Omnivorous. Mediterranean distr.

*Solenopsis* sp.: Aoos-Vris, 26.V.81, ♀♀. This species is similar to *S. orbula* Em. in that it has a smooth head, visible but obtuse lateral clypeal teeth, eyes with two ommatidia, rounded epinotum with shallow meso-epinotal groove and length less than 2mm. However, the shape of the head is different. It is rounded and oval, very similar to that of *S. fugax*. The geographical distribution of *S. orbula* is also quite different being known only from Corsica, Sardinia and Malta. Nest under stone on open ground on river bank. Numerous workers.

*Leptothorax unifasciatus* (Latreille (1798): Aoos-K, 18.IV.81, 2 ♀, 29.V.81, 1 ♀; Grev, 20.IV.81, 1 ♀; Tsep, 26.V.81, 3 ♀; Vris a, 27.V.81, 11 ♀. Omnivorous. S. European distr.

*Leptothorax nylandereri* (Foerster 1850): Vris c, 28.V.81, 2 ♀; Kap, 4.VIII.81, 1 ♀. Omnivorous. European distr.

*Tetramorium caespitum* (L. 1758): Void, 18.IV.81, 4 ♀; Grev, 20.IV.81, ♀♀; Gyft, 26.V.81, 13 ♀; Vris c, 28.V.81, ♀♀. Very common. Omnivorous. Holarctic distr.

*Tetramorium semilaeve* Andre 1889: Vris a, 27.V.81, 1 ♀, 23.X.81, 6 ♀. Omnivorous. Pontomediterranean distr.

#### DOLICHODERINAE

*Dolichoderus quadripunctatus* (L. 1771): Vris b, 26.V.81, 2 ♀; Aoos-Vris, 26.V.81, 1 ♀. Insectivorous. S. European distr.

*Dolichoderus* sp.: Vris b, 26.V.81, 1 ♀. This specimen differs from the typical *D. quadripunctatus* in the following points. Head and thorax with obvious but less pronounced

punctures, colour of thorax lighter, yellowish brown, pronotum less rounded, without pronounced shoulders, narrowing towards the neck, epinotum without spines or teeth, completely rounded, petiole with little developed node, not completely triangular with more or less rounded edges. All other characters identical with *D. quadripunctatus*.

*Liometopum microcephalum* (Panzer 1798): Grev, 20.IV.81, ♀♀. Large nests on *Quercus* sp. Numerous workers. Insectivorous. Pontomediterranean distr.

*Tapinoma erraticum* (Latreille 1798): Neg, 25.IX.79, 4 ♀; Kip, 15.IV.81, 5 ♀; Gyft, 26.V.81, 1 ♀, 21.X.81, ♀♀; Vris a, 27.V.81, 5 ♀; Vris c, 28.V.81, 1 ♀, 10♂; Aaos-K, 29.V.81, 1 ♀. Nectarivorous. Eurasiatic distr.

#### FORMICINAE

*Plagiolepis pygmaea* (Latreille 1798): Aaos-K, 18.IV.81, ♀♀, 29.V.81, 10 ♀; Aaos-Vris, 26.V.81, 6 ♀. Nectarivorous. South European distr.

*Cataglyphis nodus* (Brulle 1832): Vris b, 26.V.81, 4 ♀; Aaos-Vris, 26.V.81, 1 ♀; Vris a, 27.V.81, 2 ♀. Nests in the ground with a single entrance. Insectivorous. Mediterranean distr.

*Camponotus aethiops* (Latreille 1798): Vik, 26.IX.79, 3 ♀; Kip, 15.IV.81, 1 ♀; Grev, 20.IV.81, 1 ♀; Aaos-K, 29.V.81, 8 ♀; Aaos-Vris, 26.V.81, 1 ♀; Vris a, 27.V.81, 1 ♀. Nests in the ground with many entrances. Omnivorous. Pontomediterranean distr.

*Camponotus marginatus* (Latreille 1798): Aaos-K, 29.V.81, 7 ♀. Omnivorous. Pontomediterranean distr.

*Camponotus piceus* (Leach 1825): Aaos-K, 18.IV.81, 4 ♀; Gyft, 26.V.81, 1 ♀, 2 ♀; Vris a, 27.V.81, 5 ♀; Kap, 4.VIII.81, 2 ♀. Omnivorous. South European distr.

*Camponotus ligniperda* (Latreille 1802): Vris c, 28.V.81, 1 ♀, 7 ♀. Nest under fallen beech trunk. Omnivorous. Eurasiatic distr.

*Camponotus vagus* (Scopoli 1763): Gyft, 26.V.81, 6 ♀; Vris b, 26.V.81, 1 ♀, 4 ♀; Aaos-Vris, 26.V.81, 4 ♀; Aaos-K, 29.V.81, 2 ♀; Kap, 4.VIII.81, 4 ♀. Nests in the ground. Omnivorous. Eurasiatic distr.

*Prenolepis nitens* (Mayr 1852): Vik, 26.IX.79, 5 ♀; Aaos-K, 18.IV.81, 7 ♀, 21.X.81, 1 ♀, 6 ♀; Aaos-Vris, 26.V.81, 8 ♀; Vris a, 23.X.81, 3 ♀. Nectarivorous. Eurasiatic distr.

*Lasius emarginatus* (Olivier 1791): Neg, 25.IX.79, 4 ♀; Kip, 15.IV.81, ♀♀; Grev, 20.IV.81, 7 ♀; Tsep, 26.V.81, 9 ♀; Gyft, 26.V.81, 9 ♀; Vris b, 26.V.81, 3 ♀; Aaos-Vris, 26.V.81, 9 ♀; Vris a, 27.V.81, ♀♀; Vris c, 28.V.81, ♀♀; Aaos-K, 29.V.81, 1 ♀; Kap, 4.VIII.81, 1 ♀. Very common everywhere. Nectarivorous. Eurasiatic distr.

*Lasius flavus* (F. 1781): Aaos-Vris, 26.V.81, ♀♀; Vris c, 28.V.81, 6 ♀; Gyft, 21.X.81, 4 ♀; Vris a, 23.X.81, 5 ♀. Nests under stones. Nectarivorous. Holarctic.

*Formica lugubris* Zetterstedt 1840: Grev, 20.IV.81, 1 ♀. Insectivorous. European distr.

*Formica cunicularia* Latreille 1798: Vris c, 28.V.81, 5 ♀. Nest under fallen beech trunk. Insectivorous. Eurasiatic distr.

*Formica fusca* L. 1758: Grev, 20.IV.81, 4 ♀; Vris b, 26.V.81, 3 ♀; Vris a, 23.X.81, 5 ♀. Insectivorous. Palearctic.

*Formica gagates* Latreille 1798: Kip, 15.IV.81, 3 ♀; Grev, 20.IV.81, 3 ♀; Vris b, 26.V.81, 4 ♀; Aaos-Vris, 26.V.81, 2 ♀; Vris a, 27.V.81, 3 ♀; Aaos-K, 29.V.81, 5 ♀; Gyft, 21.X.81, 9 ♀. Insectivorous. Pontomediterranean distr.

*Formica rufibarbis* F. 1793: Kip, 15.IV.81, 2 ♀; Void, 18.IV.81, 1 ♀; Gyft, 26.V.81, 1 ♀, 2 ♀; Aaos-Vris, 26.V.81, 7 ♀; Vris a, 27.V.81, 1 ♀; Vris c, 28.V.81, 6 ♀. Insectivorous. Palearctic.

#### Discussion

An analysis of the general distribution of the species observed in Zagori reveals that the ants there do not belong to one particular type of distribution. A 22.6 % of the species have a Eurasiatic distribution, 19.3 % have Pontomediterranean distribution, 16.1 % have Mediterranean distribution, 16.1 % have South European distribution, 9.7 % have European distribution, 6.5 % have Holarctic distribution, 6.5 % have Palearctic distribution and 3.2 % have Eurosiberian distribution. It seems that the influence of the Mediterranean, South European, Asiatic and Pontic elements is more or less equal, contrary to the situation in the ant fauna of Southern and Insular Greece where Mediterranean and South European elements predominate (Legakis unpublished results). The distribution types are more comparable with those in the Central Balkans (Paraschivescu 1974). However, if we separate the

anthrophilous species which were observed in or near human settlements, we find that they consist of species with more pronounced South European and Mediterranean distribution (21.1 % and 26.3 %, respectively).

One interesting aspect for the zoogeography of the region, is that it represents the up to now known southernmost limit of distribution for some species in the Balkans f.e. *F. lugubris* and *F. gagates* (Ronchetti 1978, Santschi 1926).

The majority of the ant species of Zagori live in a wide range of altitudes. Seven species have been found only above 1000m (*M. sabuleti*, *L. microcephalum*, *F. lugubris*, *A. ovaticeps*, *C. ligniperda*, *F. cunicularia*, *M. ruginodis*). The last three species have been found only over 1400m. Of these, *C. ligniperda* has a Eurosiberian distribution and the others are always found most abundant in more northern climates.

Most ant species of Zagori are insectivorous (45.2 %) and omnivorous species (35.5 %). Seventy five percent of the omnivorous species were observed in or near human settlements, while only 50 % of the insectivorous species were observed there. On the contrary, six out of the seven species living over 1000m were insectivores. This is expected because omnivorous species take better advantage of the varied food that man can provide them.

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KEY WORDS: Ants, Hymenoptera, Formicidae, Ponerinae, Myrmicinae, Dolichoderinae, Formicinae, Zagori Epirus Greece

## Πρώτη Συνεισφορά στη Μελέτη των Μυρμηγκιών της Περιοχής Ζαγοριού (Ήπειρος, Ελλάδα): Κατάλογος Ειδών με Σχόλια

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### ΠΕΡΙΛΗΨΗ

Το άρθρο περιλαμβάνει αναφορές σε 33 είδη μυρμηγκιών που συλλέχτηκαν στην περιοχή Ζαγοριού της Ηπείρου κατά την διάρκεια 5 ταξιδιών το 1979 και το 1981. Αυτές είναι οι πρώτες αναφορές στην ύπαρξη μυρμηγκιών από αυτή την περιοχή. Στο κείμενο περιλαμβάνονται μερικά στοιχεία για την μορφολογία και οικολογία των ειδών αυτών. Η ανάλυση της γενικής εξάπλωσης των ειδών της περιοχής δείχνει ότι η επίδραση των Μεσογειακών, Νοτιοευρωπαϊκών, Ασιατικών και Ποντιακών στοιχείων είναι περίπου ίση. Για μερικά είδη η περιοχή είναι το νοτιότερο όριο εξάπλωσης τους στα Βαλκάνια. Εφτά είδη παρατηρήθηκαν μόνο πάνω από 1000μ ενώ τρία από αυτά παρατηρήθηκαν μόνο πάνω από 1400 μ. Τα περισσότερα είδη είναι εντομοφάγα ή παμφάγα. Αντίθετα, τα είδη που ζουν μέσα ή κοντά σε ανθρώπινους οικισμούς είναι κυρίως παμφάγα και έχουν περισσότερο Μεσογειακή και Νοτιοευρωπαϊκή εξάπλωση.