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The species of Ichneumonidae (Hymenoptera) occurring in fields of *Medicago* spp. in the Mediterranean region

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Following investigations carried out in 15 countries of the Western Palaearctic region, the distribution of 180 species of ichneumonids obtained from plants of *Medicago* spp. growing in a Mediterranean type climate is recorded.

INTRODUCTION

From 1973 to 1990, surveys were conducted by the CSIRO Biological Control Unit in the Mediterranean region with the aim of discovering natural enemies of various insect pests accidentally introduced into Australia, where they were causing economic damage to *Medicago* spp. (Leguminosae) (AESCHLIMANN, 1980; 1981; AESCHLIMANN & VITOU, 1989). This long-lasting research covered practically all countries of North Africa, southern Europe and the Middle East with a Mediterranean type climate. During all that time, the fauna of Ichneumonidae (Hymenoptera: Ichneumonoidea) found on the same host plants was also recorded, based on specimens either reared or collected and prepared directly for subsequent identification.

DISTRIBUTION OF ICHNEUMONIDS

In each of the countries considered, between 6 and 99 different sites were selected and studied, using criteria and techniques described in detail by AESCHLIMANN (1979; 1980). The abundance of the various species of ichneumonids was assessed for the whole region according to the following scale:

- + = rare (few individuals recorded at all)
- ++ = occasional (representatives obtained at several sites)
- +++ = common (species found at most sites).

All recorded species are listed in Tab. 1 in alphabetical order, the subfamilies following TOWNES's (1969) system (column 1). The different countries of investigation are indicated in column 2 in a West to East sequence. The total period during which specimens were observed each year is indicated in the third column. Identified host species were as follows (column 4):

- (1) ex *Ostrinia nubilalis* HÜBNER (Lep.: Pyralidae)
- (2) ex *Larinus*, *Lixus*, and *Rhinocyllus* spp. (Col.: Curculionidae)
- (3) ex *Yponomeuta* spp. (Lep.: Yponomeutidae)
- (4) ex *Hypera* spp. (Col.: Curculionidae)

- (5) ex Chrysopidae gen. sp.
 (6) ex ichneumonid parasitoids of *Hypera* spp.
 (7) ex *Apanteles glomeratus* L. (Hym.: Braconidae)
 (8) ex Dipteran parasitoids of snails
 (9) ex *Grapholita nebritana* TREITSCHKE (Lep.: Tortricidae)
 (10) ex Pyralidae gen. sp. (Lep.)
 (11) ex *Ethmia bipunctella* FAB. (Lep.: Ethmiidae)
 (12) ex various syrphid spp. on *Medicago* spp.
 (13) ex *Plutella xylostella* L. (Lep.: Plutellidae)

Tab. 1. Ichneumonids recorded on *Medicago* spp. in the Mediterranean region: A = Algeria, B = Bulgaria, C = Cyprus, E = Spain, F = France, G = Greece, I = Italy, M = Morocco, P = Portugal, Q = Iraq, R = Rumania, S = Syria, T = Tunisia, U = Turkey, Y = Yugoslavia.

Subfamily and species	Countries	Period	Abundance	Hosts
1. Ephialtinae				
<i>Coccygomimus instigator</i> F.	MG	Sep–Nov	+	(1)
<i>C. spuria</i> GR.	ATFGU	Mar–Nov	++	
<i>Exeristes roborator</i> F.	MIRU	May–Nov	+	(2)
<i>Itopectis europeator</i> AUB.	FU	May–Nov	+	(3)
<i>I. maculator</i> FAB.	MATPEFIYGBRCUS	Mar–Oct	+++	(4 & 6)
<i>I. melanocephala</i> GR.	F	Oct	+	
<i>Perithous septemcinctorius</i> THB.	FU	May–Sep	+	
<i>Scambus brevicornis</i> GR.	EF	Mar–May	+	
<i>S. detrita</i> HLM.	IU	Apr–May	+	
<i>S. nigricans</i> THS.	R	May	+	
<i>Schizopyga circulator</i> Pz.	FI	Apr–Nov	++	
<i>S. podagrica</i> GR.	F	Aug–Oct	+	
<i>Tromatobia abdominalis</i> BRUL.	TC	Nov	+	
<i>Zaglyptus multicolor</i> GR.	U	May	+	
<i>Z. varipes</i> GR.	U	May	+	
2. Tryphoninae				
<i>Cycasis rubiginosus</i> GR.	F	Apr	+	
<i>Monoblastus brachyacanthus</i> GM.	GU	May	+	
<i>M. marginellus</i> GR.	U	May	+	
<i>Netelia fuscicarpus</i> KOK.	M	Nov	+	
<i>N. fuscicornis</i> HLM.	G	May	+	
<i>Tryphon ephippium</i> HLM.	B	May	+	
<i>T. rutilator</i> L.	GRU	Apr–May	+	
<i>T. signator</i> GR.	FU	Apr–May	+	
<i>T. trochanterus</i> HLM.	B	May	+	
<i>T. zavreli</i> GREG.	U	May	+	
3. Gelinae				
<i>Agrothereutes tunetanus</i> HAB.	T	May	+	
<i>Aritranus heliophilus</i> TSCHEK	F	Jul	+	
<i>A. nigripes</i> GR.	U	May	+	

Subfamily and species	Countries	Period	Abundance	Hosts
<i>Bathytrix decipiens</i> GR.	U	May	+	
<i>Dichrogaster aestivalis</i> GR.	TF	May–Oct	++	(5)
<i>D. diatropus</i> TOWNES	F	Jun	+	
<i>Endasys brevis</i> GR.	F	May	+	
<i>Gelis cyanurus</i> FÖRST.	FU	May	+	
<i>G. formicarius</i> L.	F	May–Jun	+	(6)
<i>G. kiesenwetteri</i> FÖRST.	F	Mar–Jun	+	(6)
<i>G. sculpturator</i> AUB.	T	May	+	
<i>Glyphicnemis vagabundus</i> GR.	GU	May	+	
<i>Hemiteles breviareolatus</i> THS.	M	Nov	+	
<i>Ischnus minutorius</i> FÖRST.	TU	May	+	
<i>Iselix clotho</i> KRIECHB.	I	Aug	+	
<i>I. nitidus</i> GR.	F	Apr–Nov	+	
<i>Itamoplex spiralis</i> GEOFF.	BU	May	+	
<i>Lysibia nanus</i> GR.	F	Mar–Nov	++	(7)
<i>Mastrulus marshalli</i> BR. & FITCH	U	May	+	
<i>Mastrus melanarius</i> GR.	M	Nov	+	
<i>Mesoleptus marginatus</i> THS.	TFG	May–Jun	++	
<i>M. petiolaris</i> THS.	F	Oct–Dec	++	(8)
<i>Mesostenus grammicus</i> GR.	A	May	+	
<i>Phygadeuon troglodytes</i> GR.	MAEFU	May–Nov	++	
<i>P. variabilis</i> GR.	FRUS	Mar–Aug	++	
<i>P. vexator</i> THB.	FIU	Apr–Oct	++	
<i>Pycnocryptodes reticulator</i> AUB.	C	May	+	
<i>Pycnocryptus director</i> THB.	C	May	+	
<i>Rhembobius flagitator</i> GR.	U	May	+	
<i>R. quadrispinus</i> GR.	FC	May–Oct	+	
<i>Stilpnus gagates</i> GR.	T	May	+	
<i>Synechocryptus bovei</i> BRULLE	T	May	+	
<i>Theroscopus hemipterus</i> F.	MFCU	Mar–Nov	++	
<i>Trychosis legator</i> THB.	FCU	Apr–Jun	++	
<i>Zoophthorus graculus</i> GR.	FCU	Mar–Jul	++	(6)

4. Banchinae

<i>Apophua bipunctoria</i> THB.	F	Aug	+	
<i>Cryptopimpla calceolata</i> GR.	F	Oct	+	
<i>Exetastes adpressorius</i> THB.	MTF	May–Nov	+	
<i>Glypta haesitator</i> GR.	M	May	+	
<i>Lissonota clypeator</i> GR.	F	Jun	+	
<i>L. fundator</i> THB.	FG	Oct–Nov	+	
<i>L. impressor</i> GR.	F	Sep	+	
<i>L. lineolator</i> AUB.	F	Jul	+	
<i>L. proxima</i> FONSC.	F	Oct	+	

5. Scolobatinae

<i>Hadrodactylus fugax</i> GR.	F	Sep	+	
<i>H. tiphae</i> GEOFF.	B	May	+	

Subfamily and species	Countries	Period	Abundance	Hosts
<i>Perilissus filicornis</i> GR.	FB	May–Jun	+	
<i>P. rufoniger</i> GR.	FGBU	Apr–Jun	++	
<i>Rhorus gracilitor</i> AUB.	U	May	+	
<i>Scolobates auriculatus</i> F.	F	Jul	+	
<i>Trematopygus triangulator</i> AUB.	U	May	+	
6. Porizontinae				
<i>Bathyplectes carthagenensis</i> SMITS	TU	May	+	(4)
<i>B. corvinus</i> THS.	IU	Apr–May	++	(4)
<i>B. curculionis</i> THS.	MATFIGUS	Feb–Jun	+++	(4)
<i>B. exiguus</i> GR.	T	May	+	
<i>B. graecator</i> AUB.	FGBUS	Mar–May	++	(4)
<i>B. quinqueangularis</i> RTZ.	FU	Mar–May	+	
<i>Biolysia tristis</i> GR.	FUS	Mar–Oct	+	
<i>Campoletis annulata</i> GR.	MATFRU	Mar–Nov	++	
<i>C. crassicornis</i> TSCHEK	MAEIU	Mar–Nov	+	
<i>C. raptor</i> ZETT.	MF	May–Nov	+	
<i>C. vienensis</i> GR.	U	May	+	
<i>Campoplex elongator</i> AUB.	F	Jul–Sep	+	
<i>C. faunus</i> GR.	TFCU	Apr–Sep	+	(9)
<i>C. molestus</i> GR.	C	May	+	
<i>C. nigrifemur</i> SZPL.	U	May	+	
<i>C. punctulatus</i> SZPL.	F	Oct	+	
<i>Casitaria albipalpis</i> GR.	I	Apr	+	
<i>C. orbitalis</i> GR.	AF	Jun–Oct	+	
<i>Cymodusa australis</i> SMITS	U	May	+	
<i>C. leucocera</i> HLM.	F	Oct	+	
<i>Diadegma armillata</i> GR.	FC	May–Oct	+	(3)
<i>D. claripennis</i> THS.	M	Nov	+	
<i>D. combinatum</i> HLM.	F	Oct	+	
<i>D. crassicornis</i> GR.	AC	May–Nov	+	
<i>D. fenestralis</i> HLM.	FIU	Apr–Oct	+	
<i>D. hispanica</i> HORST.	S	Mar	+	
<i>D. ledicola</i> HORST.	F	Jul	+	
<i>D. pyreneator</i> AUB.	F	Apr	+	
<i>D. turcator</i> AUB.	MAT	May–Nov	+	
<i>D. variegata</i> SZPL.	F	Jun	+	
<i>Dusona americana</i> ASHM.	G	May	+	
<i>D. heterocerus</i> FÖRST.	F	May–Oct	+	
<i>D. terebrator</i> FÖRST.	FI	May–Oct	+	
<i>Hyposoter didymator</i> FÖRST.	MATFGCU	May–Nov	++	
<i>H. dolosus</i> GR.	U	May	+	
<i>H. notatus</i> GR.	F	Jun–Oct	+	
<i>Meloboris collector</i> THB.	MFC	Jun–Oct	+	(10)
<i>Nemeritis arianensis</i> SMITS	T	May	+	
<i>Sinophorus nigritellus</i> THS.	MTEF	Jun–Nov	+	
<i>S. xanthosoma</i> GR.	ATEFGRQ	Apr–Nov	++	

Subfamily and species	Countries	Period	Abundance	Hosts
<i>Tranosema nigridens</i> THS.	R	May	+	
<i>Venturia canescens</i> GR.	I	Nov	+	
7. Cremastinae				
<i>Cremastus europeator</i> AUB.	MT	Nov	+	
<i>C. hierochonticus</i> SCHM.	C	Apr–Nov	+	
<i>Pristomerus orbitalis</i> HLM.	FU	May–Sep	+	
<i>Temelucha confluens</i> GR.	T	Oct	+	
<i>T. decolorata</i> GR.	F	Jun	+	
<i>T. momelnensis</i> SED.	FS	Mar–Jun	+	
8. Tersilochinae				
<i>Gonolochus caudatus</i> HLM.	R	May	+	
<i>G. fenestralis</i> THS.	U	May	+	
<i>Tersilochus triangularis</i> GR.	U	May	+	
<i>T. tripartitus</i> BRISCHKE	F	Apr	+	
9. Ophioninae				
<i>Enicospilus tournieri</i> VOLL.	M	Nov	+	
<i>Ophion impressus</i> THB.	B	May	+	
10. Mesochorinae				
<i>Astiphromma nigriceps</i> BRISCHKE	U	May	+	
<i>Mesochorus nigripes</i> RTZ.	MATFIRUS	Mar–Jun	++	(6)
<i>M. picticus</i> THS.	RU	May	+	
<i>M. thoracicus</i> GR.	I	Apr	+	
11. Metopiinae				
<i>Exochus castaniventris</i> BRAUNS	U	May	+	
<i>E. coronatus</i> GR.	MTC	Nov	+	
<i>E. erythronotus</i> GR.	FG	Jun–Nov	+	
<i>E. foveolatus</i> SCHM.	F	Jul–Aug	+	
<i>E. prosopius</i> GR.	F	Sep–Nov	+	
<i>E. punctifer</i> SCHM.	F	Jun	+	
<i>E. quadrimaculatus</i> SCHM.	GR	May	+	
<i>E. rubroater</i> SCHM.	F	Jul	+	
<i>E. thomsoni</i> SCHM.	R	May	+	
<i>Hypsicera subtilitor</i> AUB.	U	Oct	+	
<i>Triclistus lativentris</i> THS.	FU	May–Nov	+	(11)
12. Anomalinae				
<i>Agrypon hilare</i> TOSQ.	F	Jun	+	
<i>Anomalon foliator</i> FAB.	MEFC	Apr–Nov	++	
<i>Barylypa uniguttatum</i> GR.	G	Apr	+	
<i>Heteropelma calcator</i> WSM.	F	Jun	+	
<i>Therion circumflexum</i> L.	F	Apr–Oct	+	
<i>Trichionotus debile</i> WSM.	FU	May–Jun	+	

Subfamily and species	Countries	Period	Abundance	Hosts
13. Microleptinae				
<i>Megastylus cruentator</i> SCHIO.	I	Apr	+	
14. Collyriinae				
<i>Collyria calcitrator</i> GR.	GBRUQ	Apr–May	++	
<i>C. iberia</i> SCHM.	M	May	+	
<i>C. orientator</i> AUB.	C	May	+	
15. Orthocentrinae				
<i>Orthocentrus castellanus</i> CEB.	C	May	+	
16. Diplazontinae				
<i>Diplazon laetatorius</i> PZ.	MATEFIYGBRCUSQ	Mar–Oct	+++	(12)
<i>Enizemum ornatum</i> GR.	F	Mar	+	
<i>Homotropus elegans</i> GR.	MAT	May–Nov	+	
<i>Promethes sulcator</i> GR.	FGR	May–Oct	+	
<i>Sussaba coriacea</i> DASCH	F	Apr	+	
<i>S. pulchella</i> HLM.	B	May	+	
<i>Syrphoctonus nigritarsus</i> GR.	F	May–Jul	+	
<i>S. signatus</i> GR.	FUQ	May–Jul	+	
<i>Syrphophilus bizonarius</i> GR.	MAFIRUS	Mar–Nov	++	
<i>Woldstedtius biguttatus</i> GR.	U	May	+	
17. Ichneumoninae				
<i>Aethecerus discolor</i> WSM.	F	Oct	+	
<i>A. nitidus</i> WSM.	I	Apr–May	+	
<i>A. placidus</i> WSM.	MA	Nov	+	
<i>Amblyteles armatorius</i> FÖRST.	FICU	Apr–Oct	+	
<i>A. pictus</i> SCHRANK	FG	Apr–Oct	+	
<i>Anisobas cingulatorius</i> GR.	F	May–Oct	+	
<i>Barichneumon bilunulatus</i> GR.	F	Oct	+	
<i>Centeterus major</i> WSM.	U	May	+	
<i>Colpognathus divisus</i> THS.	U	Apr–May	+	
<i>Ctenichneumon edictorius</i> L.	T	Nov	+	
<i>C. panzeri</i> WSM.	E	Nov	+	
<i>Diadromus collaris</i> GR.	MTFG	May–Dec	++	(13)
<i>Dicaelotus resplendens</i> HLM.	GU	May–Nov	+	
<i>Diphyus raptorius</i> L.	F	Jun	+	
<i>Homotherus locutor</i> THB.	C	May	+	
<i>Hoplismenus albifrons</i> GR.	U	Apr	+	
<i>Ichneumon sarcitorius</i> L.	FC	May–Oct	+	
<i>I. zonalis</i> GR.	I	Apr	+	
<i>Neotypus intermedius</i> MOCS.	T	Nov	+	
<i>Patroclus homocerus</i> WSM.	F	Jan–Jul	+	
<i>Phaeogenes nigridens</i> WSM.	F	Oct	+	
<i>Platylabus tricingulatus</i> GR.	AEG	Mar–Nov	+	
<i>Rhexidermus truncator</i> FÖRST.	FRC	Feb–Dec	++	
<i>Triptognathus rubrocinctus</i> LUCAS	M	Nov	+	

Some 20% of the ichneumonid species found were relatively widespread on cultivated and/or annual *Medicago* spp., i. e. occurred with abundance levels between ++ and ++++. Most species with high abundance indices could also be reared from various hosts found on these plants (last column of the Table), many of which also represent new records. On several occasions, material collected in the course of the present investigations has served for describing new taxa (e. g. AUBERT, 1977), and apart perhaps from France (cf. AUBERT, 1980 and other papers in the same series), most records mentioned in Table 1 are new for each country. In addition, an estimated 200 specimens belonging mainly to the large and difficult genera *Diadegma*, *Exochus*, and *Gelis* have not yet been determined to the specific level.

The ichneumonid fauna reported here in relation with *Medicago* spp. is extremely rich and diversified, the total number of species obtained so far being comparable to the total number of specimens recorded for the family on cultivated lucerne by ROTH (1971) for instance, or in a whole area as large as the Camargue (VILLEMANT, 1982) in southern France.

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RÉSUMÉ

Une étude de longue haleine, portant sur les années 1973 à 1990 a permis de dresser une liste de 180 espèces d'ichneumonides associées aux cultures de luzernes pérennes ou annuelles de 15 pays à régime climatique de type méditerranéen.

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