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THRIPS (INSECTA: THYSANOPTERA) OF A *JUNIPERUS THURIFERA* FOREST OF LOS MONEGROS REGION (ZARAGOZA, SPAIN)

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ABSTRACT

Thrips (Insecta: Thysanoptera) of a *Juniperus thurifera* forest the Los Monegros region (Zaragoza, Spain).

A survey of the thrips of a *Juniperus thurifera* forest in the Los Monegros region (Zaragoza, Spain) was carried out between 1989 and 1994. In total, 6,866 specimens belonging to 69 species and 29 genera were collected. Some facts on the ecology of the Order in the area and trap efficiency are given.

Key words: Thysanoptera, phenology, traps efficiency, faunistic records, Los Monegros, Zaragoza, Spain.

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INTRODUCTION

The thrips fauna of Spanish *Juniperus thurifera* L. woods has been studied, in part, by BERZOSA (1985) and BERZOSA & MAROTO (1986). Some fifty species were found on the plants that make up the forests where their samples were taken. Our research centres on a forest, mistakenly called «Bujaraloz (Zaragoza)» by these authors, in which BERZOSA & MAROTO (1986) found 12 species, on various plants.

The aim of this paper is a study of the qualitative composition of the thysanopteran fauna associated with the *Juniperus thurifera* communities of Los Monegros region in order to have some arguments to enforce the efforts made for its permanent conservation.

STUDY AREA

The Monegros region is situated in the central part of the Ebro valley, east of Zaragoza, in the north-east of Spain. The extreme climatic conditions of the area have produced a vegetation similar to that of the North-African steppes (BRAUN-BLANQUET & BOLÓS, 1957). OCHOA (1982) summarizes its climate as follows: large annual range of minimum and maximum temperatures, oscillating from -10 °C to above +40 °C; frequent frost in spring; prevailing winds from the NW and the SE (cold, and warm, respectively), both with great desiccating power; low annual rainfall (200-400 mm); water deficit over 300 mm.

These climatic conditions are connected with a climax vegetation of *Juniperus thurifera* L. forests of the *Juniperetum phoeniceo-thuriferae* (Br.-Bl. & O.Bolós) Rivas-Martínez community (RIVAS-MARTÍNEZ, 1987), a species-poor plant community characterized by the presence of *Juniperus thurifera* L., *Rhamnus lycioides* L., *Ephedra nebrodensis* Tineo ex Guss. and *Asparagus acutifolius* L. It is a clear forest or a steppe with trees, associated with various shrub layers whose composition depends on microclimatic (altitude, exposure, and soil) conditions (BRAUN-BLANQUET & BOLÓS, 1957). Taking into account their relative importance in the area, these main plant communities are: *Agropyro- Lygeion* Br.-Bl.& O.Bolós, steppe grasslands with perennial species on the deep soils found on hillsides being which are not very steep, and at the foot of the hills; *Ononidetum tridentatae* Br.-Bl.& O.Bolós, dense, vigorous shrub mostly found on gentle sunny hillsides, which indicates the presence of a deep layer of gypsum; *Salsolo vermiculatae-Peganetum harmalae* Br.-Bl.& O.Bolós, a community of nitrophilous species found in abandoned fields and places where organic matter accumulates (mainly as a result of the presence of sheep); *Helianthemetum squamati* Br.-Bl.& O.Bolós, a community of low, stunted shrubs and a very important lichen component which is found on very eroded hilltops; *Suaedetum verae* Br.-Bl.& O.Bolós, dense aggregations of halophilous species which occur in places that have become saline owing to poor draining; *Roemerio violaceae- Hypecoetum penduli* Br.-Bl. & O.Bolós and *Carduo pycnocephali- Hordeetum leporini* Br.-Bl., plant communities associated with cereal crops and waysides, respectively.

MATERIAL AND METHODS

Specimens have been collected mainly from 1990 to 1994 in an area near the village of Pina de Ebro (Zaragoza province) called «Retuerta de Pina» (UTM grid square 30T YL29). The mean altitude is 360 m. Soils (QUIRANTES, 1978) are mostly gypsum, with some marl and clay. It is the last well-preserved *Juniperus thurifera* L. forest in the Monegros region.

The following collecting methods have been used with success to collect thrips:

Moericke trap. A metal container, yellow inside and green outside, 60×60×10 cm, on a 70 cm high stand, filled with slightly soapy water. Both samples and water were removed once a week and grouped by fortnights. It worked from May 1990 to December 1991, with two breaks, August-September 1990 and July-September 1991.

Coloured dishes. 25 plastic trays (9 yellow, 8 blue, 8 white), 26×16×4 cm, were used, filled with soapy water. They were in use from February 1990 to December 1991, set once in a fortnight in 1991, and left in operation for 24 hours on each occasion. The specimens were grouped by fortnights.

Malaise trap. Two traps 180 cm long, 121 cm wide and 206 cm to 183 cm high were used. The collecting liquid was 70 % alcohol. They were in use from September 1990 till December 1991, emptied once a week; the material was grouped by fortnights.

Sweeping from plants. An insect net was used once a fortnight from January to December 1992 on 21 plant species: the *Agropyro-Lygeion* Br.-Bl. & Bolós (a plant community composed mainly of perennial steppic grasses), *Artemisia herba-alba* Asso, *Atriplex halimus* L., *Ephedra nebrodensis* Tineo ex Guss., *Genista scorpius* (L.) DC., *Gypsophila struthium* L. ssp. *hispanica* (Willk.) G. López, *Helianthemum squamatum* (L.) Pers., *Juniperus phoenicea* L., *Juniperus thurifera* L., *Lithodora fruticosa* (L.) Griseb (from April to September only), *Ononis tridentata* L., *Osyris alba* L., *Pinus halepensis* Miller, *Quercus coccifera* L., *Retama sphaerocarpa* (L.) Boiss, *Rhamnus lycioides* L., *Rosmarinus officinalis* L., *Salsola vermiculata* L., *Santolina chamaecyparissus* L., *Suaeda vera* J.F. Gmelin, and *Tamarix canariensis* Willd. During 1994, the following plants were swept with the same frequency: *Asparagus acutifolius* L., *Frankenia thymifolia* Desf., *Lepidium subulatum* L., *Peganum harmala* L., *Salvia lavandulifolia* Vahl., and *Thymus vulgaris* L. More samples were taken before and after those

years but without regularity on the same and other plant species like *Anacyclus clavatus* (Desf.) Pers., *Carduus bourgeanus* Boiss.& Reuter, *Centaurea melitensis* L., *Crepis vesicaria* L., Cruciferae sp. in crops, *Diplotaxis erucoides* (L.) DC, *Eruca vesicaria* (L.) Cav., *Euphorbia serrata* L., *Hypecoum procumbens* L., *Krascheninnikovia ceratoides* (L.) Guelden., *Marrubium vulgare* L., *Medicago sativa* L., *Reseda lutea* L., *Salsola kali* L., *Sisymbrium irio* L., *Teucrium capitatum* L., *Thapsia villosa* L. and *Triticum* sp..

Wilkening trap. Three traps built according to the model of WILKENING *et al.*(1981) were used, 32 cm high and 11 cm wide. They were placed among the branches of *J. phoenicea, J. thurifera* and *P. halepensis* and among brushes of *R. officinalis*. They were worked from January to December 1992. Samples were removed once a week and grouped by fortnights.

Other trap methods like a light trap, a Wilkening trap placed inside an old building and pitfall traps baited with carrion, beer or vinegar were unsuccessful in collecting thrips.

For the preparation of the tables we have excluded both the material collected by means of those techniques which did not operate a whole calendar year and, in the case of those techniques which were operational over periods longer than a calendar year, the material collected outside the calendar year. So collected during only that material has been considered whichwas 1991 for coloured dishes and the Malaise traps, 1992 and 1994 for sweeping on plants and 1992 for Wilkening traps.

FAUNISTICAL ACCOUNT

A total of 6,866 specimens were collected, although some of them had deteriorated beyond recognition by the time they were retrieved and proved therefore impossible to determine. The determined material includes 69 species belonging to 29 genera. One species (*Blascothrips zumetai*) is so far known only from the Monegros area, and has been described recently as type species of a new genus (ZUR STRASSEN, 1997); two species (*Ankothrips mavromoustakisi* and *Haplothrips titschackianus*) are here recorded from Spain for the first time; 51 species, marked (*), are first records for Zaragoza province and 36 species, marked (**), are recorded for the first time in association with *Juniperus thurifera* woods, which are thought to be Terciary relicts in Spain (BERZOSA & MAROTO, 1986).

SUBORDER TEREBRANTIA

FAMILY AEOLOTHRIPIDAE

Aeolothrips collaris Priesner, 1919 (**)(*)

Distribution: Indo-Mediterranean.

Material examined: Coloured dishes: 2.VIII.90: 1 ♀; 22.VIII.91: 2 ♀♀. Malaise trap: 7.VI.91: 3 ♂♂ 4 ♀♀ . Wilkening trap: in *J. thurifera*, 14.VII.92: 1 ♂ 3 ♀♀; in *R. officinalis*, 10.V.92: 1 ♂ 2 ♀♀; 14.VII.92: 1 ♂ 2 ♀♀. By sweeping: on *J. phoenicea*, 21.VII.92: 1 ♂; on *G. struthium*, 22.V.92: 1 ♂; on *Triticum* sp., 2.V.92: 3 ♂♂ 1 ♀. Total: 11 ♂♂ 15 ♀♀.

Aeolothrips fasciatus (Linnaeus, 1758) (**)(*)

Distribution: Holarctic.

Material examined: By sweeping: on Cruciferae in a crop, 28.VI.92: 1 ♂ 6 ♀♀; on *R. officinalis*, 10.IV.92: 1 ♂ 4 ♀♀; on *Triticum* sp., 20.VI.92: 1 ♀. Total: 2 ♂♂ 11 ♀♀.

Aeolothrips intermedius Bagnall, 1934

Distribution: West-Palaearctic. Recorded from the area by BERZOSA & MAROTO (1986).

Material examined: Moericke trap: 28.V.90: 3 ♀♀; 9.IV.91: 1 ♀; 25.IV.91: 2 ♂♂ 4 ♀♀; 7.V.91: 3 ♂♂ 11 ♀♀; 20.V.91: 2 ♂♂ 1 ♀. Coloured dishes: 14.IV.90: 1 ♂; 2.VI.90: 2 ♂♂ 7 ♀♀; 22.VIII.90: 1 ♂; 3.IX.90: 3 ♀♀; 16.IX.90: 1 ♂ 3 ♀♀; 9.IV.91: 1 ♂ 1 ♀; 25.IV.91: 1 ♀; 7.VI.91: 8 ♂♂ 8 ♀♀; 20.VI.91: 4 ♂♂ 6 ♀♀; 9.IX.91: 2 ♂♂ 7 ♀♀; 20.IX.91: 1 ♀. Malaise trap: 18.IX.90: 1 ♂ 1 ♀; 7.VI.91: 6 ♀♀; 25.VII.91: 2 ♂♂ 4 ♀♀; 25.VIII.91: 7 ♂♂ 6 ♀♀; 12.IX.91: 3 ♂♂ 8 ♀♀; 23.IX.91: 2 ♂♂ 3 ♀♀. Wilkening trap: in *P. halepensis*, 10.V.92: 1 ♀; in *R. officinalis*, 20.III.92: 2 ♂♂ 2 ♀♀, 10.IV.92: 4 ♂♂ 9 ♀♀, 22.V.92: 1 ♂ 2 ♀♀, 25.VII.92: 1 ♂ 1 ♀. By sweeping: on *A. clavatus*, 11.VI.92: 3 ♂♂ 23 ♀♀ 1 larva; on *A. acutifolius*, 6.VI.94: 1 ♂; on *A. halimus*, 15.VI.91: 4 ♂♂ 4 ♀♀; on *C. vesicaria*, 2.V.92: 2 ♂♂ 2 ♀♀; on *J. thurifera*, 21.VII.91: 1 % 4 ♀♀; on *G. struthium*: 1.VIII.91: 7 ♀♀, 12.VIII.92: 1 ♂ 18 ♀♀ 2 larvae, 28.VIII.92: 4 ♂♂ 12 ♀♀, 10.IX.92: 1 ♂ 5 ♀♀ 2 larvae; in the *C. pycnocephali-H. leporini*, 20.IV.92: 2 ♂♂ 2 ♀♀; on *H. procumbens*, 20.IV.92: 2 ♂♂; on *L. subulatum*, 24.IV.94: 1 ♂ 2 ♀♀ 4 larvae; on *O. tridentata*, 8.VII.92: 4 ♀♀; on *P. harmala*, 5.V.94: 1 ♂ 3 larvae; on *R. lutea*, 8.V.92: 2 ♀♀; on *S. kali*, 12.VIII.92: 1 ♂ 1 ♀; on *S. vermiculata*, 8.VIII.92: 1 ♂ 3 ♀♀; on *S. irio*, 11.IV.92: 8 ♂♂ 47 ♀♀; on *S. vera*, 9.VI.91: 1 ♂ 5 ♀♀, 15.VI.91: 1 ♂ 3 ♀♀ 1 larva, 22.V.92: 5 ♀♀ 4 larvae; on *T. villosa*, 1.VI.91: 2 ♂♂ 7 ♀♀; on *Triticum* sp., 2.V.92: 3 ♂♂ 1 ♀. Total: 91 ♂♂ 259 ♀♀ 17 larvae.

Aeolothrips melisi Priesner, 1936 (**)(*)

Distribution: West-Mediterranean.

Material examined: By sweeping: on Cruciferae in a crop: 28.VI.92: 4 ♂♂ 14 ♀♀. Total: 4 ♂♂ 14 ♀♀.

Aeolothrips tenuicornis Bagnall, 1926

Distribution: Europe. Recorded from the area by BERZOSA & MAROTO (1986).

Material examined: Moericke trap: 25.III.91: 5 ♂♂ 2 ♀♀; 9.IV.91: 30 ♂♂ 6 ♀♀; 25.IV.91: 20 ♂♂ 18 ♀♀; 7.V.91: 5 ♂♂ 10 ♀♀; 20.V.91: 8 ♂♂ 2 ♀♀. Coloured dishes: 17.III.90: 7 ♂♂ 9 ♀♀; 14.IV.90: 5 ♂♂ 13 ♀♀; 25.III.91: 11 ♂♂ 14 ♀♀; 9.IV.91: 28 ♂♂ 31 ♀♀; 25.IV.91: 10 ♂♂ 14 ♀♀; 7.V.91: 5 ♂♂ 8 ♀♀; 7.VI.91: 7 ♂♂ 8 ♀♀; 20.VI.91: 3 ♂♂ 12 ♀♀. Malaise trap: 25.III.91: 9 ♂♂ 1 ♀; 9.IV.91: 7 ♂♂ 12 ♀♀; 25.IV.91: 22 ♂♂ 34 ♀♀; 7.V.91: 6 ♂♂ 13 ♀♀; 24.V.91: 12 ♂♂ 33 ♀♀, 7.VI.91: 5 ♂♂ 5 ♀♀; 20.VI.91: 16 ♂♂ 55 ♀♀; 25.VII.91: 1 ♂; 7.VIII.91: 3 ♀♀. Wilkening trap: in *J. phoenicea*, 25.IV.92: 1 ♂, 10.V.92: 1 ♂; in *J. thurifera*, 25.IV.92: 1 ♂ 1 ♀; in *R. officinalis*, 10.III.92: 3 ♀♀, 22.V.92: 2 ♂♂ 7 ♀♀, 28.VI.92: 1 ♀. By sweeping: on *C. bourgeanus*, 20.V.91: 15 ♀♀; on Cruciferae on crops, 28.VI.92: 3 ♂♂ 24 ♀♀; on *E. vesicaria*, 13.IV.92: 2 ♂♂ 13 ♀♀; on *E. serrata*, 2.V.92: 1 ♂ 21 ♀♀; on *F. thymifolia*, 1.VI.91: 3 ♂♂ 2 ♀♀; on *G. scorpius*, 24.III.90: 1 ♂, 10.III.92: 4 ♀♀, 24.III.92: 1 ♀, 10.IV.92: 3 ♀♀; on *G. struthium*, 28.VI.92: 13 ♀♀, 8.VII.92: 2 ♀♀ 1 larva; on *H. squamatum*, 22.V.92: 1 ♂ 3 ♀♀, 21.VII.92: 7 ♀♀; on the *C. pycnocephali-H. leporini*, 26.VII.92: 4 ♀♀; on *L. subulatum*, 24.III.94: 2 ♂♂ 9 ♀♀; on *M. sativa*, 21.VII.92: 1 ♀; on *O. tridentata*, 21.VII.92: 1 ♂ 5 ♀♀; on *R. lutea*, 2.V.92: 1 ♂ 28 ♀♀, 8.V.92: 7 ♀♀; on *R. sphaerocarpa*, 10.V.92: 1 ♀, 11.VI.92: 2 ♂♂ 3 ♀♀; on *T. villosa*, 1.VI.91: 2 ♂♂ 5 ♀♀. Total: 246 ♂♂ 486 ♀♀ 1 larva.

Ankothrips mavromoustakisi Priesner, 1939 (**)(*)

Distribution: Mediterranean.

Material examined: Moericke trap: 20.XI.91: 1 ♂ 1 ♀. Total: 1 ♂ 1 ♀.

Ankothrips niezabitowskii (Schille, 1910) (**)(*)

Distribution: Europe.

Material examined: By sweeping: on *J. phoenicea*, 5.XII.92: 2 ♂♂ 4 ♀♀. Total: 2 ♂♂ 4 ♀♀.

Ankothrips thuriferae BERZOSA & MAROTO, 1983 (*)

Distribution: Spain.

Material examined: Malaise trap: 23.IX.91: 1 ♀. Total: 1 ♀.

Melanthrips areolatus Priesner, 1936 (**)(*)

Distribution: Mediterranean.

Material examined: By sweeping: on *S. vera*, 9.VI.91: 1 ♂ 6 ♀♀, 15.VI.91: 1 ♀. Total: 1 ♂ 7 ♀♀.

Melanthrips fuscus (Sulzer, 1776)

Distribution: Palaearctic. Recorded from the area by BERZOSA & MAROTO (1986).

Material examined: Moericke trap: 9.IV.91: 2 ♂♂ 4 ♀♀; 25.IV.91: 2 ♀♀; 7.V.91: 1 ♀; 20.X.91: 2 ♂♂ 4 ♀♀; 9.XI.91: 1 ♂ 2 ♀♀. Coloured dishes: 16.IX.90: 1 ♂ 2 ♀♀; 14.X.90: 3 ♀♀; 25.III.91: 1 ♀; 9.IV.91: 1 ♂; 25.IV.91: 1 ♂ 1 ♀; 7.V.91: 1 ♀; 20.VI.91: 1 ♀; 10.IX.91: 2 ♀♀; 20.IX.91: 9 ♀♀; 9.X.91: 2 ♂♂ 1 ♀; 26.X.91: 1 ♂ 3 ♀♀. Malaise trap: 18.IX.90: 2 ♂♂ 2 ♀♀; 17.X.90: 5 ♂♂ 7 ♀♀; 28.X.90: 4 ♂♂ 2 ♀♀; 11.XI.90: 1 ♀; 25.III.91: 1 ♂ 2 ♀♀; 9.IV.91: 3 ♂♂ 5 ♀♀; 23.IX.91: 4 ♀♀; 9.XI.91: 1 ♂. Wilkening trap: in *P. halepensis*, 25.IV.92: 1 ♀; in *R. officinalis*, 10.IV.92: 2 ♂♂ 4 ♀♀, 25.IV.92: 2 ♂♂ 4 ♀♀. By sweeping: on *A. halimus*, 20.IV.92: 1 ♂ 8 ♀♀; on *E. vesicaria*, 23.IV.92: 2 ♂♂ 1 ♀; on *E. serrata*, 2.V.92: 1 ♂ 2 ♀♀; on *G. scorpius*, 20.IV.92: 2 ♀♀; on *G. struthium*, 10.IV.92: 1 ♀; on *L. fruticosa*, 20.IV.92: 1 ♀; on *P. halepensis*, 20.IV.92: 1 ♀; on *R. lutea*, 2.V.92: 1 ♂ 1 ♀; on *S. irio*, 11.IV.92: 2 ♀♀; on *S. vera*, 24.III.92: 4 ♀♀, 10.IV.92: 1 ♂ 10 ♀♀; 2.V.92: 2 ♂♂ 4 ♀♀ 2 larvae, 28.VI.92: 1 ♂ 7 ♀♀, 6.VII.92: 2 ♂♂, 30.IV.94: 17 ♀♀. Total: 42 ♂♂ 130 ♀♀ 2 larvae.

Melanthrips knechteli Priesner, 1936 (*)

Distribution: Mediterranean.

Material examined: Wilkening trap: in *R. officinalis*, 10.V.92: 1 ♀. Total: 1 ♀.

Rhipidothrips brunneus Williams, 1913 (**)(*)

Distribution: Holarctic.

Material examined: Coloured dishes: 14.IV.90: 1 ♀; 25.IV.91: 1 ♀; 5.VII.91: 1 ♀. Malaise trap: 7.V.91: 1 ♀, 24.V.91: 1 ♀. By sweeping: on *S. irio*: 1 ♀; on *S. vera*, 30.IV.94: 1 ♀; on *Triticum* sp.: 5 ♂♂ 24 ♀♀. Berlese funnel with soil under *A. halimus*, 20.I.94: 1 ♀ apterous. Total: 5 ♂♂ 32 ♀♀.

Rhipidothrips gratiosus Uzel, 1895 (**)(*)

Distribution: West-Palaearctic.

Material examined: Coloured dishes: 9.IV.91: 1 ♂; 25.IV.91: 3 ♂♂. By sweeping: in the *C. pycnocephali-H. leporini*, 20.IV.92: 3 ♀♀. Total: 4 ♂♂ 3 ♀♀.

FAMILY THRIPIDAE

Anaphothrips obscurus (Müller, 1776) (*)

Distribution: Semi-Cosmopolitan.

Material examined: By sweeping: on *J. thurifera*, 9.II.92: 1 ♀, 10.IV.92: 1 ♀. Total: 2 ♀♀.

Blascothrips zumetai zur Strassen, 1997 (**)

Distribution: Only known from Los Monegros area.

Material examined: By sweeping: on *K. ceratoides*, 26.VIII.96: 5 ♂♂ 19 ♀♀ 7 larvae, 3.IX.96: 1 ♂ 9 ♀♀ 9 larvae, 15.IX.96: 2 ♂♂ 4 ♀♀ 9 larvae, 23.IX.96: 1 ♂ 4 ♀♀ 9 larvae, 2.X.96:

1 ♂ 11 ♀♀ 9 larvae, 8.X.96: 3 ♂♂ 14 ♀♀ 6 larvae, 9.X.96: 8 ♀♀ 3 larvae, 26.X.96: 4 ♂♂ 20 ♀♀, 9.XI.96: 12 ♀♀, 26.XI.96: 1 ♀. Total: 17 ♂♂ 102 ♀♀ 52 larvae.

Chirothrips aculeatus Bagnall, 1927 (*)

Distribution: Holarctic.

Material examined: Moericke trap: 2.VI.90: 1 ♀; 25.III.91: 1 ♀. Coloured dishes: 25.III.91: 1 ♀. Malaise trap: 9.IV.91: 1 ♀; 20.VI.91: 1 ♀. By sweeping: in the *Agropyro-Lygeion*, 25.V.92: 2 ♀♀, 8.VII.92: 1 ♀; on *F. thymifolia*, 1.VI.91: 1 ♀; on *S. vera*, 9.VI.91: 1 ♀; on *Triticum* sp., 2.V.92: 1 ♂ 2 ♀♀. Total: 1 ♂ 12 ♀♀.

Chirothrips manicatus Haliday, 1836 (*)

Distribution: Holarctic.

Material examined: By sweeping: on the *Agropyro-Lygeion*, 20.IV.92: 1 ♀, 25.V.92: 4 ♀♀; on *G. struthium*, 21.VII.92: 1 ♂. Total: 1 ♂ 5 ♀♀.

Eremiothrips sp. (*)

Material examined: Moericke trap: 9.IV.91: 1 ♀. Coloured dishes: 24.II.90: 1 ♀, 29.IV.90: 2 ♀♀; 22.VIII.90: 4 ♂♂ 4 ♀♀; 16.IX.90: 3 ♂♂ 17 ♀♀; 6.X.90: 1 ♀; 9.IV.91: 6 ♀♀; 25.IV.91: 1 ♀; 20.VI.91: 5 ♂♂ 8 ♀♀; 22.VIII.91: 19 ♂♂ 66 ♀♀; 9.IX.91: 9 ♂♂ 27 ♀♀; 20.IX.91: 2 ♀♀. Malaise trap: 25.III.91: 1 ♀; 25.VIII.91: 31 ♀♀; 10.IX.91: 13 ♀♀; 23.IX.91: 10 ♀♀. By sweeping: on *A. halimus*, 15.VI.91: 1 ♀; on *G. struthium*, 1.VIII.91: 2 ♀♀; on *S. vera*, 9.VI.91: 3 ♂♂ 3 ♀♀, 16.V.91: 7 ♂♂ 3 ♀♀. Total: 50 ♂♂ 202 ♀♀.

Frankliniella intonsa (Trybom, 1895) (**)(*)

Distribution: Palaearctic and some parts of the Oriental Region.

Material examined: Moericke trap: 11.VII.90: 3 ♀♀; 28.VIII.90: 7 ♂♂ 10 ♀♀; 25.IX.90: 1 ♂ 3 ♀♀; 25.III.91: 5 ♀♀; 9.IV.91: 2 ♀♀; 20.X.91: 1 ♀. Coloured dishes: 18.II.90: 1 ♀; 24.II.90: 23 ♀♀; 14.IV.90: 2 ♀♀; 2.VIII.90: 1 ♂ 1 ♀; 22.VIII.90: 2 ♀♀; 3.IX.90: 9 ♀♀; 16.IX.90: 1 ♀; 6.X.90: 1 ♀; 25.III.91: 4 ♀♀; 22.VIII.91: 2 ♀♀; 9.IX.91: 28 ♀♀; 20.IX.91: 4 ♀♀. Malaise trap: 18.IX.90: 1 ♀; 25.III.91: 2 ♀♀; 24.V.91: 1 ♀; 25.VII.91: 1 ♀; 7.VIII.91: 2 ♀♀; 25.VIII.91: 14 ♀♀; 10.IX.91: 35 ♀♀; 23.IX.91: 43 ♀♀; 9.X.91: 1 ♀. Wilkening trap: in *J. phoenicea*, 20.III.92: 1 ♀, 10.V.92: 1 ♀, 28.VIII.92: 1 ♀, 10.IX.92: 4 ♀♀; in *J. thurifera*, 20.III.92: 1 ♂ 1 ♀, 25.VII.92: 1 ♂ 1 ♀, 13.VIII.92: 2 ♀♀, 25.IV.94: 1 ♀; in *P. halepensis*, 20.III.92: 1 ♀, 10.V.92: 1 ♀; in *R. officinalis*, 20.III.92: 10 ♀♀, 10.V.92: 3 ♀♀, 28.VI.92: 1 ♀, 13.VIII.92: 3 ♂♂ 6 ♀♀, 28.VIII.92: 1 ♂ 6 ♀♀, 9.XI.92: 2 ♀♀. By sweeping: on *G. struthium*, 28.VIII.92: 3 ♀♀; on *J. thurifera*, 21.VII.91: 6 ♀♀; on *L. subulatum*, 24.III.94: 3 ♀♀; on *R. sphaerocarpa*, 25.V.92: 3 ♀♀. Total: 15 ♂♂ 259 ♀♀.

Frankliniella occidentalis (Pergande, 1895) (**)(*)

Distribution: In origin West-Nearctic. Today Semi-cosmopolitan.

Material examined: Coloured dishes: 9.IX.91: 4 ♂♂ 29 ♀♀; 20.IX.91: 1 ♂ 6 ♀♀; 9.X.91: 2 ♂♂ 4 ♀♀. Malaise trap: 18.IX.90: 11 ♀♀; 25.VIII.91: 65 ♀♀; 12.IX.91: 2 ♀; 23.IX.91: 13 ♀♀; 9.XI.91: 1 ♀. By sweeping: on *J. thurifera*, 21.VII.91: 1 ♀; on *L. subulatum*, 24.III.94: 6 ♂♂ 9 ♀♀, 6.IV.94: 1 ♂ 1 ♀, 24.IV.94: 6 ♀; on *P. harmala*, 24.III.94: 2 ♂♂ 8 ♀♀. Total: 16 ♂♂ 156 ♀♀.

Frankliniella tenuicornis (Uzel, 1895) (**)(*)

Distribution: Holarctic.

Material examined: Moericke trap: 28.V.90: 1 ♀. Malaise trap: 20.VI.91: 3 ♀♀; 25.VII.91: 1 ♀; 10.IX.91: 2 ♀♀. Wilkening trap: in *P. halepensis*, 14.VII.92: 1 ♀; in *R. officinalis*, 10.V.92: 1 ♂ 3 ♀♀, 14.VII.92: 4 ♀♀, 25.VII.92: 4 ♀♀. By sweeping: on *M. sativa*, 21.VII.92: 1 ♀ 1 larva. Total: 1 ♂ 20 ♀♀ 1 larva.

Hyalopterothrips sp. (*)

Material examined: Coloured dishes: 14.V.90: 1 ♂; 29.IV.90: 1 ♂. Total: 2 ♂♂.

Kakothrips firmoides Priesner, 1932

Distribution: West-Mediterranean. Recorded from the area by BERZOSA & MAROTO (1986).

Material examined: Coloured dishes: 20.II.91: 1 ♀. Wilkening trap: in *R. officinalis*, 10.IV.92: 1 ♀. By sweeping: on *G. scorpius*, 25.II.92: 17 ♀♀, 24.III.92: 3 ♀♀; on *R. sphaerocarpa*, 25.II.92: 3 ♀♀, 10.V.92: 1 ♂ 1 ♀; on *R. lycioides*, 9.II.92: 2 ♀♀; on *S. vermiculata*, 22.II.92: 1 ♀; on *S. vera*, 10.IV.92: 1 ♀. Total: 1 ♂ 30 ♀♀.

Limothrips angulicornis Jablonowski, 1894 (*)

Distribution: West-Palaearctic.

Material examined: By sweeping: on *S. vera*, 9.VI.91: 2 ♀♀. Total: 2 ♀♀.

Limothrips cerealium Haliday, 1836 (*)

Distribution: Cosmopolitan.

Material examined: Moericke trap: 25.III.91: 6 ♀♀; 20.V.91: 1 ♀. Coloured dishes: 14.IV.90: 1 ♀; 2.VI.90: 1 ♀; 9.III.91: 42 ♀♀; 25.III.91: 2 ♀♀; 9.IV.91: 1 ♀; 7.VI.91: 1 ♀; 18.VI.91: 1 ♀; 20.VI.91: 2 ♀♀; 20.IX.91: 1 ♀; 9.II.92: 1 ♀; 20.II.91: 22 ♀♀. Malaise trap: 25.III.91: 4 ♀♀; 24.V.91: 5 ♀♀: 20.VI.91: 10 ♀♀. Wilkening trap: in *J. thurifera*, 14.VII.92: 4 ♀♀, 21.XI.92: 1 ♀; in *P. halepensis*, 10.III.92: 1 ♀, 14.VII.92: 2 ♀♀; 25.VII.92: 2 ♀♀. By sweeping: in the *Agropyro-Lygeion*, 10.III.92: 1 ♀; on *A. clavatus*, 11.VI.92: 2 ♀♀; on *A. herba-alba*, 28.VI.92: 1 ♀; on *C. bourgeanus*, 20.V.91: 1 ♀; on *G. struthium*, 22.V.92: 1 ♀; in the *C. pycnocephali-H. leporini*, 20.IV.92: 1 ♀; on *R. sphaerocarpa*, 25.V.92: 1 ♀; on *S. vera*, 9.VI.91: 7 ♀♀; on *Triticum* sp., 2.V.92: 2 ♂♂ 11 ♀♀, 20.VI.92: 1 ♂ 4 ♀♀ 2 larvae. Total: 3 ♂♂ 141 ♀♀ 2 larvae.

Limothrips denticornis Haliday, 1836 (*)

Distribution: Holarctic.

Material examined: Moericke trap: 2.VI.90: 1 ♀. Malaise trap: 7.VI.91: 10 ♀♀; 20.VI.91: 9 ♀♀. Wilkening trap: in *P. halepensis*, 14.VII.92: 1 ♀. By sweeping: in the *Agropyro-Lygeion*, 25.V.92: 1 ♀; on *A. herba-alba*, 6.VII.92: 1 ♀; on *J. thurifera*, 6.VII.92: 1 ♀; on *Triticum* sp., 20.VI.92: 1 ♀. Total: 25 ♀♀.

Odontothrips ignobilis Bagnall, 1919 (*)

Distribution: Western Europe.

Material examined: Wilkening trap: in *J. phoenicea*, 22.V.92: 1 ♀; in *R. officinalis*, 14.VII.92: 1 larva. By sweeping: on Cruciferae sp. in a crop, 28.VI.92: 2 ♂♂ 10 ♀♀; on *G. scorpius*, 10.III.92: 10 ♀♀; on *L. subulatum*, 24.IV.94, 1 ♂ 2 ♀♀; on *O. tridentata*, 22.V.92, 1 ♂ 2 ♀♀, 28.VI.92: 2 ♂♂, 8.VII.92: 6 ♀♀; on *R. sphaerocarpa*, 10.V.92: 1 ♂ 1 ♀, 25.V.92: 18 ♀♀; 11.VI.92: 3 ♂♂ 24 ♀♀ 6 larvae. Total: 10 ♂♂ 74 ♀♀ 7 larvae.

Odontothrips ramadei Bournier, 1990 (**)(*)

Distribution: West-Mediterranean. Described from Morocco, this species is known in the Iberian Peninsula only from this area (ZUR STRASSEN, 1996).

Material examined: Coloured dishes: 9.IX.91: 1 ♂ 2 ♀♀. Total: 1 ♂ 2 ♀♀.

Odontothrips ulicis Haliday, 1836 (**)(*)

Distribution: Atlantic and Western Europe.

Material examined: By sweeping: on *G. scorpius*, 24.III.92: 4 ♀♀. Total: 4 ♀♀.

Oxythrips ajugae Uzel, 1895 (**)(*)

Distribution: Palaearctic.

Material examined: Moericke trap: 25.IV.91: 1 ♂ 21 ♀♀; 7.V.91: 3 ♀♀. Wilkening trap: in *P. halepensis*, 10.IV.92: 1 ♀. By sweeping: on *P. halepensis*, 22.II.92: 10 ♀♀, 9.III.92: 4 ♀♀. Total: 1 ♂ 39 ♀♀.

Oxythrips bicolor (O.M. Reuter, 1879) (**)(*)

Distribution: Europe.

Material examined: Wilkening trap: in *P. halepensis*, 10.IV.92: 2 ♀♀. By sweeping: on *P. halepensis*, 24.III.92: 2 ♀♀. Total: 4 ♀♀.

Oxythrips perisi Berzosa, 1981 (*)

Distribution: Spain.

Material examined: Moericke trap: 9.IV.91: 1 ♀. Coloured dishes: 10.II.90: 1 ♀; 20.II.91: 1 ♂ 1 ♀; 25.III.91: 1 ♂; 9.IV.91: 2 ♀♀. Malaise trap: 9.II.91: 5 ♂♂ 8 ♀♀; 19.II.91: 1 ♂. Total: 8 ♂♂ 13 ♀♀.

Oxythrips sabinae Berzosa, 1985

Distribution: Spain. Recorded from the area by Berzosa (1985).

Material examined: Moericke trap: 20.XI.91: 6 ♂♂ 21 ♀♀; 20.XII.91: 1 ♀. Coloured dishes: 9.IV.91: 2 ♀♀. Malaise trap: 20.XI.91: 3 ♂♂ 4 ♀♀. Total: 9 ♂♂ 28 ♀♀.

Rubiothrips sp. (*)

Material examined: By sweeping: on *F. thymifolia*, 1.VI.91: 1 ♀. Total: 1 ♀.

Scirtothrips inermis Priesner, 1933 (**)(*)

Distribution: In origin Mediterranean. Today also subtropical.

Material examined: By sweeping: on *E. nebrodensis*, 2.V.92: 1 ♀. Total: 1 ♀.

Sericothrips bicornis (Karny, 1910) (**)(*)

Distribution: Euro-Siberian.

Material examined: Coloured dishes: 9.IX.91: 1 ♀. Total: 1 ♀.

Stenothrips graminum Uzel, 1895 (**)(*)

Distribution: West-Palaearctic.

Material examined: Malaise trap: 7.V.91: 1 ♀. Total: 1 ♀.

Tenothrips discolor (Karny, 1907)

Distribution: Turano-Mediterranean. Recorded from the area by Berzosa & Maroto (1986).

Material examined: Moericke trap: 28.VIII.90: 2 ♂♂ 4 ♀♀; 25.IX.90: 11 ♀♀; 17.X.90: 3 ♀♀; 25.III.91: 61 ♀♀; 9.IV.91: 21 ♀♀; 25.IV.91: 17 ♀♀; 7.V.91: 10 ♀♀; 20.V.91: 2 ♂♂ 11 ♀♀. Coloured dishes: 30.VII.90: 11 ♂♂ 2 ♀♀; 22.VIII.90: 1 ♂ 5 ♀♀; 3.IX.90: 19 ♂♂ 59 ♀♀; 16.IX.90: 4 ♂♂ 10 ♀♀; 6.X.90: 10 ♀♀; 14.X.90: 1 ♀; 17.XI.90: 1 ♂ 3 ♀♀; 20.II.91: 6 ♀♀; 9.III.91: 1 ♂ 15 ♀♀; 25.III.91: 18 ♀♀; 9.IV.91: 91 ♀♀; 25.IV.91: 6 ♀♀; 7.V.91: 3 ♂♂ 9 ♀♀; 2.VI.91: 25 ♂♂ 69 ♀♀; 20.VI.91: 6 ♂♂ 22 ♀♀; 8.VII.91: 7 ♂♂ 77 ♀♀; 22.VIII.91: 2 ♂♂ 45 ♀♀; 9.IX.91: 37 ♂♂ 513 ♀♀; 20.IX.91: 1 ♂♂ 7 ♀♀; 9.X.91: 1 ♂ 4 ♀♀. Malaise trap: 18.IX.90: 3 ♂♂ 30 ♀♀; 17.X.90: 6 ♀♀; 28.X.90: 1 ♀; 11.XI.90: 2 ♀♀; 25.III.91: 3 ♀♀; 9.IV.91: 3 ♀♀; 10.IX.91: 4 ♀♀; 9.XI.91: 3 ♀♀. Wilkening trap: in *J. phoenicea*, 13.VIII.92: 2 ♂♂ 2 ♀♀, 10.IX.92: 2 ♀♀; in *P. halepensis*, 10.III.92: 1 ♀, 10.IV.92: 1 ♀; in *R. officinalis*, 20.III.92: 2 ♂♂, 10.V.92: 2 ♀♀, 22.V.92: 1 ♂ 1 ♀, 25.VII.92: 2 ♂♂ 3 ♀♀. By sweeping: in the *Agropyro- Lygeion*, 11.X.92: 1 ♀; on *A. herba-*

alba, 12.IX.92: 1 ♀, 7.XI.92: 3 ♀♀; on *C. bourgeanus*, 20.V.91: 1 ♂ 5 ♀♀; on *C. vesicaria*, 2.V.92, 2 ♀♀; on *F. thymifolia*, 1.VI.91: 2 ♀♀; on *G. struthium*, 1.VIII.91: 1 ♂ 6 ♀♀, 22.V.92: 1 ♀, 10.IX.92: 2 ♂♂ 6 ♀♀; on *H. squamatum*, 8.VII.92: 1 ♀; in the *C. pycnocephali-H. leporini*, 26.VII.92: 1 ♂ 2 ♀♀; on *H. procumbens*, 20.IV.92: 1 ♀; on *J. thurifera*, 21.VII.91: 6 ♂♂ 36 ♀♀; on *L. subulatum*, 19.II.94: 1 ♀; on *M. vulgare*, 15.VI.91: 1 ♀; on *S. chamaecyparissus*, 15.VI.91: 5 ♂♂ 2 ♀♀; on *T. capitatum*, 6.VII.91: 1 ♀; on *T. villosa*, 1.VI.91: 1 ♀. Total: 149 ♂♂ 1,248 ♀♀.

Tenothrips frici (Uzel, 1895) (**)(*)

Distribution: West-Palaearctic.

Material examined: Moericke trap: 20.X.91: 2 ♂♂ 13 ♀♀; 9.XI.91: 2 ♀♀. Coloured dishes: 20.VI.91: 7 ♂♂ 9 ♀♀; 8.VII.91: 11 ♂♂ 43 ♀♀; 21.VII.91: 44 ♂♂ 114 ♀♀; 22.VIII.91: 5 ♂♂ 20 ♀♀; 9.IX.91: 7 ♂♂ 15 ♀♀; 20.IX.91: 3 ♂♂ 10 ♀♀; 9.X.91: 12 ♂♂ 26 ♀♀; 26.X.91: 1 ♀. Malaise trap: 25.VII.91: 2 ♂♂ 2 ♀♀; 7.VIII.91: 2 ♀♀; 25.VIII.91: 6 ♀♀; 10.IX.91: 2 ♀♀; 9.X.91: 1 ♀; 9.XI.91: 1 ♀. Wilkening trap: in *J. phoenicea*, 25.VII.92: 2 ♀♀, 10.IX.92: 11 ♂♂ 18 ♀♀; in *R. officinalis*, 14.VII.92: 4 ♂♂ 15 ♀♀, 25.VII.92: 6 ♂♂ 34 ♀♀, 13.VIII.92: 9 ♂♂ 31 ♀♀; 28.VIII.92: 8 ♂♂ 31 ♀♀, 9.XI.92: 3 ♀♀. By sweeping: on *A. halimus*, 20.IV.92: 1 ♀; on *C. vesicaria*, 2.V.92: 2 ♀♀; on *E. nebrodensis*, 20.IV.92: 18 ♀♀; on *G. scorpius*, 20-IV-92: 46 ♀♀; on *G. struthium*, 12.VIII.92: 3 ♂♂ 10 ♀♀, 10.IX.92: 1 ♂ 4 ♀♀; on *O. tridentata*, 22.V.92: 1 ♀; on *R. sphaerocarpa*, 10.V.92: 1 ♀; on *R. officinalis*, 21.VII.92: 1 ♂ 1 ♀; on *S. vermiculata*, 22.VIII.92: 2 ♀♀; on *S. vera*, 20.VII.92: 1 ♀. Total: 136 ♂♂ 488 ♀♀.

Tenothrips hispanicus (Bagnall, 1921)

Distribution: Europe. Recorded from the area by Berzosa & Maroto (1986).

Material examined: By sweeping: on *J. thurifera*, 7.XI.92: 2 ♀♀; 5.XII.92: 16 ♀♀; 20.XII.92: 3 ♀♀. Total: 21 ♀♀.

Tenothrips pallidivestis (Priesner, 1926) (**)(*)

Distribution: Ponto-Mediterranean.

Material examined: Moericke trap: 2.VI.90: 4 ♀♀; 11.VII.90: 8 ♀♀; 28.VIII.90: 34 ♂♂ 80 ♀♀; 25.IX.90: 2 ♂♂ 5 ♀♀; 17.X.90: 5 ♂♂ 6 ♀♀; 9.IV.91: 2 ♀♀; 25.IV.91: 6 ♀♀; 7.V.91: 3 ♀♀; 20.V.91: 3 ♀♀. Coloured dishes: 24.II.90: 24 ♀♀; 17.III.90: 6 ♀♀; 14.IV.90: 3 ♀♀; 29.IV.90: 1 ♂ 1 ♀; 28.VI.90: 1 ♂ 1 ♀; 30.VII.90: 20 ♂♂ 6 ♀♀; 2.VIII.90: 2 ♂♂ 17 ♀♀; 22.VIII.90: 18 ♂♂ 32 ♀♀; 3.IX.90: 13 ♂♂ 28 ♀♀; 16.IX.90: 2 ♂♂ 22 ♀♀; 6.X.90: 1 ♀; 14.X.90: 8 ♀♀; 17.XI.90: 1 ♀; 20.II.91: 1 ♀; 25.III.91: 1 ♀; 25.IV.91: 1 ♀; 7.V.91: 1 ♀. Malaise trap: 18.IX.90: 5 ♀♀; 17.X.90: 1 ♀; 28.X.90: 1 ♀. Wilkening trap: in *R. officinalis*, 22.V.92: 4 ♀. Total: 98 ♂♂ 282 ♀♀.

Thrips angusticeps Uzel, 1895 (*)

Distribution: Palaearctic.

Material examined: Moericke trap: 2.VI.90: 1 ♀; 25.IX.90: 1 ♀; 21.I.91: 2 ♀♀; 25.III.91: 4 ♀♀; 25.IV.91: 2 ♀♀; 7.V.91: 3 ♀♀; 20.V.91: 2 ♂♂ 4 ♀♀. Coloured dishes: 14.IV.90: 1 ♂; 12.I.91: 1 ♂ 11 ♀♀; 21.I.91: 1 ♂; 9.II.91: 1 ♀; 20.II.91: 12 ♀♀; 9.III.91: 1 ♂; 9.IV.91: 1 ♂; 25.IV.91: 1 ♂ 1 ♀; 7.V.91: 2 ♀♀; 9.X.91: 1 ♂ 1 ♀. Malaise trap: 25.III.91: 2 ♀♀; 7.V.91: 1 ♀; 19.II.92: 1 ♀. Wilkening trap: in *R. officinalis*, 20.III.92: 2 ♀♀, 10.V.92: 1 ♂ 2 ♀♀, 22.V.92: 1 ♂. By sweeping: on *C. bourgeanus*, 20.V.91: 3 ♀♀; on *C. vesicaria*, 2.V.92: 5 ♂♂ 28 ♀♀; on *D. erucoides*, 20.XII.92: 3 ♀♀; on *E. nebrodensis*, 20.IV.92: 1 ♂; on *E. vesicaria*, 23.IV.92: 1 ♀; on *L. subulatum*, 24.III.94: 2 ♀♀, 6.IV.94: 1 ♀, 24.IV.94: 3 ♀♀; on *O. tridentata*, 29.III.92: 1 ♀; on *S. irio*, 14.IV.92: 10 ♀♀; on *Triticum* sp., 2.V.92: 4 ♂♂ 4 ♀♀. Total: 21 ♂♂ 109 ♀♀.

Thrips atratus Haliday, 1836 (*)

Distribution: Palaearctic.

Material examined: Wilkening trap: in *P. halepensis*, 25.V.92: 1 ♀. By sweeping: on *G.*

scorpius, 25.II.92: 2 ♀♀. Total: 3 ♀♀.

Thrips flavus Schrank, 1776 (**)(*)

Distribution: Semi-cosmopolitan. Palaearctic in origin.

Material examined: By sweeping: on *S. irio*, 11.IV.92: 2 ♀♀. Total: 2 ♀♀.

Thrips mareoticus Priesner, 1932 (**)(*)

Distribution: Mediterranean.

Material examined: By sweeping: on *S. irio*, 11.IV.92: 4 ♀♀. Total: 4 ♀♀.

Thrips meridionalis (Priesner, 1926)

Distribution: West-Palaearctic. Recorded from the area by BERZOSA & MAROTO (1986).

Material examined: Moericke trap: 28.V.90: 1 ♂ 5 ♀♀; 7.I.91: 4 ♀♀; 9.II.91: 1 ♀; 20.II.91: 20 ♀♀; 25.III.91: 1 ♂ 8 ♀♀; 9.IV.91: 13 ♂♂ 19 ♀♀; 25.IV.91: 13 ♂♂ 32 ♀♀; 7.V.91: 17 ♂♂ 43 ♀♀; 20.V.91: 47 ♂♂ 50 ♀♀; 20.XI.91: 1 ♀. Coloured dishes: 10.II.90: 11 ♀♀; 17.III.90: 2 ♂♂ 6 ♀♀; 14.IV.90: 1 ♂ 1 ♀; 29.IV.90: 6 ♀♀; 2.VI.90: 29 ♂♂ 64 ♀♀; 16.IX.90: 1 ♀; 14.X.90: 1 ♀; 12.I.91: 10 ♀♀; 9.II.91: 1 ♂ 7 ♀♀; 20.II.91: 21 ♀♀; 25.IV.91: 4 ♀♀; 7.VI.91: 13 ♂♂ 25 ♀♀; 8.VII.91: 1 ♂ 5 ♀♀. Malaise trap: 19.II.91: 2 ♀♀; 9.III.91: 1 ♀; 25.III.91: 1 ♀; 9.IV.91: 1 ♂ 4 ♀♀; 25.IV.91: 4 ♀♀; 24.V.91: 5 ♂♂ 9 ♀♀; 7.VI.91: 1 ♂ 13 ♀♀; 20.VI.91: 2 ♂♂ 11 ♀♀. Wilkening trap: in *J. thurifera*, 25.IV.92: 1 ♀, 10.V.92: 1 ♀; in *P. halepensis*, 10.V.92: 1 ♀; in *R. officinalis*, 10.V.92: 2 ♂♂ 2 ♀♀, 22.V.92: 1 ♂ 2 ♀♀. By sweeping: on *C. vesicaria*, 2.V.92: 2 ♀♀; on Cruciferae sp. in a crop, 28.VI.92: 1 ♂ 3 ♀♀; on *E. vesicaria*, 23.IV.92: 1 ♂ 6 ♀♀; on *G. scorpius*, 10.III.92: 14 ♀♀, 20.IV.92: 2 ♂♂ 2 ♀♀; in the *C. pycnocephali-H. leporini*, 26.VII.92: 1 ♀; on *J. thurifera*, 5.III.90: 4 ♀♀; on *L. subulatum*, 24.IV.94: 2 ♀♀; on *O. tridentata*, 21.VII.92: 1 ♀; on *O. alba*, 2.V.92: 1 ♀; on *Q. coccifera*, 22.V.92: 1 ♀; on *R. sphaerocarpa*, 25.V.92: 4 ♀♀, 11.VI.92: 1 ♂ 4 ♀♀; on *T. villosa*, 1.VI.91: 1 ♀; on *S. irio*, 11.IV.92: 1 ♀; on *S. vera*, 11.III.90: 7 ♀♀, 9.VI.91: 1 ♂ 2 ♀♀. Total: 157 ♂♂ 453 ♀♀.

Thrips nigropilosus Uzel, 1895 (*)

Distribution: Cosmopolitan.

Material examined: Coloured dishes: 9.IX.91: 1 ♀. Total: 1 ♀.

Thrips physapus Linnaeus, 1758 (*)

Distribution: Holarctic.

Material examined: Moericke trap: 2.VI.90: 1 ♀. Coloured dishes: 20.VI.91: 1 ♀; 9.IX.91: 1 ♀. Wilkening trap: in *J. phoenicea*, 10.IX.92: 8 ♂♂ 10 ♀♀; in *R. officinalis*, 25.VII.92: 1 ♂ 3 ♀♀, 13.VIII.92: 16 ♂♂ 49 ♀♀; 28.VIII.92: 2 ♂♂ 19 ♀♀. Total: 27 ♂♂ 84 ♀♀.

Thrips tabaci Lindeman, 1889

Distribution: Cosmopolitan. Recorded from the area by BERZOSA & MAROTO (1986).

Material examined: Moericke trap: 28.V.90: 1 ♀; 2.VI.90: 27 ♀♀; 11.VII.90: 4 ♀♀; 28.VIII.90: 110 ♀♀; 25.IX.90: 7 ♀♀; 17.X.90: 3 ♀♀; 7.I.91: 2 ♀♀; 25.III.91: 1 ♀; 25.IV.91: 2 ♂♂ 11 ♀♀; 7.V.91: 14 ♀♀; 20.V.91: 16 ♀♀; 20.X.91: 8 ♀♀; 9.XI.91: 8 ♀♀. Coloured dishes: 17.III.90: 2 ♀♀; 14.IV.90: 12 ♀♀; 29.IV.90: 2 ♀♀; 28.VI.90: 1 ♀; 30.VII.90: 2 ♀♀; 22.VIII.90: 4 ♀♀; 3.IX.90: 4 ♀♀; 16.IX.90: 3 ♀♀; 14.X.90: 3 ♀♀; 17.XI.90: 1 ♀; 12.I.91: 12 ♀♀; 18.VI.91: 2 ♀♀; 20.VI.91: 4 ♀♀; 22.VIII.91: 7 ♀♀; 9.IX.91: 7 ♀♀; 9.X.91: 12 ♀♀; 26.X.91: 1 ♀; 10.XI.91: 1 ♀. Malaise trap: 18.IX.90: 5 ♀♀; 17.X.90: 8 ♀♀; 28.X.90: 1 ♀; 25.IV.91: 1 ♀; 7.V.91: 4 ♀♀; 20.VI.91: 16 ♀♀; 10.IX.91: 2 ♀♀; 9.XI.91: 1 ♀. Wilkening trap: in *J. phoenicea*, 10.V.92: 1 ♀, 13.VIII.92: 2 ♀♀, 28.VIII.92: 2 ♀♀; in *J. thurifera*, 25.IV.92: 1 ♀, 10.V.92: 5 ♀♀, 14.VII.92: 2 ♀♀, 25.VII.92: 4 ♀♀ 3 larvae, 13.VIII.92: 3 ♀♀, 25.IV.94: 14 ♀♀; on *P. halepensis*, 10.V.92: 1 ♀, 14.VII.92: 1 ♂ 3 ♀♀, 25.VII.92: 10 ♀♀; in *R. officinalis*, 10.III.92: 1 ♂, 10.IV.92: 4 ♀♀, 25.IV.92: 2 ♀♀, 10.V.92:

12 ♀♀, 22.V.92: 1 ♀. By sweeping: on *A. herba-alba*, 22.V.92: 1 ♀, 20.VII.92: 1 ♀; on *C. bourgeanus*, 20.V.91: 6 ♀♀; on *D. erucoides*, 20.XII.92: 2 ♀♀; on *L. subulatum*, 19.II.94: 1 ♀, 24.III.94: 14 ♀♀, 6.IV.94: 6 ♀♀, 24.IV.94: 15 ♀♀; on *O. tridentata*, 29.III.92: 1 ♀; on *P. harmala*, 24.III.94: 3 ♀♀; on *R. lutea*, 2.V.92: 2 ♀♀; on *R. sphaerocarpa*, 10.V.92: 1 ♀; on *R. officinalis*, 22.V.92: 1 ♀; on *S. vermiculata*, 22.V.92: 1 ♀; on *S. lavandulifolia*, 24.V.94: 7 ♀♀; on *S. vera*, 30.IV.94: 2 ♀♀. Total: 461 ♀♀ 4 ♂♂ 3 larvae.

Thrips trehernei Priesner, 1926 (**)(*)

Distribution: Eurosiberian. Today also in North America.

Material examined: Moericke trap: 28.VIII.90: 1 ♀; 25.IX.90: 3 ♀♀; 25.III.91: 1 ♀; 20.X.91: 2 ♀♀. Coloured dishes: 22.VIII.90: 9 ♀♀; 3.IX.90: 1 ♀; 20.IX.91: 4 ♀♀. Total: 21 ♀♀.

SUBORDER TUBULIFERA

FAMILY PHLAEOTHRIPIDAE

Allothrips pillichellus bicolor Ananthakrishnan, 1964

Distribution: West-Palaearctic and subtropics. Recorded in the area by BERZOSA & MAROTO (1986) who collected 2 ♀♀.

Apterygothrips hispanicus (Bagnall, 1916) (**)

Distribution: Ibero-Macaronesian.

Material examined: Berlese funnel with soil under *L. fruticosa*, 5.VIII.94: 3 ♀♀. Total: 3 ♀♀.

Apterygothrips priesneri zur Strassen, 1966 (**)(*)

Distribution: Mediterranean.

Material examined: Coloured dishes: 7.V.91: 1 ♀; 25.XII.91: 1 ♀. Total: 2 ♀♀.

Bolothrips cingulatus (Karny, 1916) (**)(*)

Distribution: Ponto-Mediterranean.

Material examined: By sweeping: in the *Agropyro-Lygeion*, 10.XI.91: 2 ♀♀. Total: 2 ♀♀.

Bolothrips icarus (Uzel, 1895) (**)(*)

Distribution: Turano-European.

Material examined: By sweeping: in the *Agropyro-Lygeion*, 10.XI.91: 1 ♂, 25.V.92: 1 ♀, 23.VII.92: 2 ♂♂ 2 ♀♀, 12.VIII.92: 1 ♀, 28.XI.92: 1 ♀. Total: 3 ♂♂ 5 ♀♀.

Cephalothrips coxalis Bagnall, 1926 (*)

Distribution: Mediterranean and Germany.

Material examined: Moericke trap: 20.XI.91: 1 ♀. Coloured dishes: 24.II.90: 4 ♀♀. Total: 5 ♀♀.

Compsothrips albosignatus (O.M. Reuter, 1884) (**)(*)

Distribution: Ponto-Mediterranean.

Material examined: Wilkening trap: in *P. halepensis*, 22.V.92: 1 ♀. By sweeping: on *A. acutifolius*, 8.VII.94: 2 ♀♀; 27.VII.94: 2 ♀♀; on *P. halepensis*, 21.XI.92: 1 ♀, 20.IV.92: 1 ♀; on *S. kali*, 12.VIII.92: 1 ♀; on *S. lavandulifolia*, 21.VI.94: 1 ♀. Total: 9 ♀♀.

Compsothrips uzeli (Hood, 1951) (**)(*)

Distribution: West-Mediterranean.

Material examined: By sweeping: on *Q. coccifera*, 12.VIII.92: 4 ♀♀. Total: 4 ♀♀.

Haplothrips acanthoscelis (Karny, 1919) (**)(*)

Distribution: Euro-Siberian.

Material examined: Moericke trap: 25.III.91: 1 ♂ 5 ♀♀; 9.IV.91: 2 ♀♀. Coloured dishes: 22.VIII.91: 3 ♂♂ 5 ♀♀. Malaise trap: 25.VII.91: 3 ♂♂ 5 ♀♀; 25.VIII.91: 2 ♂♂ 8 ♀♀. Total: 9 ♂♂ 25 ♀♀.

Haplothrips aculeatus (Fabricius, 1803) (**)(*)

Distribution: Palaearctic.

Material examined: Malaise trap: 20.VI.91: 1 ♀. Total: 1 ♀.

Haplothrips cerealis Priesner, 1939

Distribution: Mediterranean. Recorded from the area by BERZOSA & MAROTO (1986) who collected 1 ♀.

Haplothrips frustrator zur Strassen, 1968 (**)(*)

Distribution: Iberian.

Material examined: Coloured dishes: 28.VI.90: 1 ♀. Total: 1 ♀.

Haplothrips marrubiicola Bagnall, 1932 (**)(*)

Distribution: South-European.

Material examined: By sweeping: on *M. vulgare*, 15.VI.91: 1 ♂ 4 ♀♀. Total: 1 ♂ 4 ♀♀.

Haplothrips niger (Osborn, 1883) (**)(*)

Distribution: Eurosiberian.

Material examined: By sweeping: on *G. struthium*, 12.VIII.92: 1 ♂ 5 ♀♀ 3 larvae; on *R. sphaerocarpa*, 11.VI.92: 4 ♂♂ 14 ♀♀; on *S. irio*, 11.IV.92: 1 ♂ 2 ♀♀. Total: 6 ♂♂ 21 ♀♀ 3 larvae.

Haplothrips reuteri (Karny, 1907)

Distribution: Circum-mediterranean. Recorded from the area by BERZOSA & MAROTO (1986).

Material examined: Moericke trap: 28.V.90: 1 ♂ 1 ♀; 28.VIII.90: 2 ♂♂ 1 ♀; 25.IX.90: 2 ♂♂; 25.III.91: 1 ♂ 3 ♀♀; 9.IV.91: 2 ♂♂ 3 ♀♀; 25.IV.91: 2 ♀♀; 7.V.91: 4 ♂♂ 4 ♀♀. Coloured dishes: 24.II.90: 1 ♂; 17.III.90: 2 ♂♂; 29.IV.90: 1 ♂ 1 ♀; 2.VIII.90: 2 ♂♂; 22.VIII.90: 1 ♂; 3.IX.90: 3 ♂♂ 2 ♀♀; 25.III.91: 3 ♀♀; 25.IV.91: 2 ♀♀; 7.V.91: 2 ♂♂; 20.VI.91: 5 ♂♂ 8 ♀♀; 8.VII.91: 3 ♂♂ 6 ♀♀; 22.VIII.91: 1 ♂; 9.IX.91: 1 ♂; 20.IX.91: 1 ♂ 3 ♀♀; 9.X.91: 1 ♂. Malaise trap: 7.VI.91: 1 ♂; 20.VI.91: 1 ♂ 1 ♀; 25.VII.91: 2 ♂♂ 2 ♀♀; 7.VIII.91: 3 ♂♂ 1 ♀. Wilkening trap: in *R. officinalis*, 10.V.92: 1 ♂ 3 ♀♀. By sweeping: on *A. clavatus*, 11.VI.92: 2 ♂♂ 4 ♀♀ 2 larvae; on *A. herba-alba*, 6.VII.91: 2 ♀♀; on *C. bourgeanus*, 20.V.91: 2 ♂♂ 2 ♀♀; on *C. melitensis*, 9.VI.90: 2 ♂♂ 7 ♀♀; on *G. struthium*, 1.VIII.91: 3 ♂♂ 6 ♀♀; on *J. thurifera*, 21.VII.91: 1 ♂ 3 ♀♀; on *O. nervosum*, 6.VII.91: 3 ♂♂ 17 ♀♀. Total: 57 ♂♂ 87 ♀♀ 2 larvae.

Haplothrips setiger Priesner, 1921 (*)

Distribution: Euro-Mediterranean and Macaronesia.

Material examined: By sweeping: on *A. halimus*, 22.VIII.92: 2 ♂♂ 16 ♀♀; on *G. struthium*, 12.VIII.92: 1 ♂ 4 ♀♀ 5 larvae, 28.VIII.92: 2 ♂♂ 8 ♀♀ 3 larvae, 10.IX.92: 1 ♂ 4 ♀♀; on *S. vermiculata*, 5.III.90: 1 ♀, 22.V.92: 1 ♂ 2 ♀♀ 1 larva, 6.VII.92: 8 ♂♂ 21 ♀♀, 23.VII.92: 8 ♂♂

26 ♀♀, 25.VII.92: 1 ♂ 2 ♀♀; on *S. vera*, 5.III.92: 2 ♀♀, 10.IV.92: 1 ♂ 2 ♀♀. Total: 25 ♂♂ 87 ♀♀ 9 larvae.

Haplothrips titschackianus zur Strassen, 1966 (**)(*)

Distribution: Ibero-Macaronesian.

Material examined: By sweeping: on *A. halimus*, 15.VI.91: 2 ♀♀. Total: 2 ♀♀.

Haplothrips tritici (Kurdjumov, 1912)

Distribution: Palaearctic.

Material examined: Wilkening trap: in *P. halepensis*, 10.V.92: 2 ♂♂ 10 ♀♀. By sweeping: on *G. scorpius*, 20.IV.92: 2 ♂♂ 8 ♀♀; on the *C. pycnocephali-H. leporini*, 20.IV.92: 2 ♂♂ 16 ♀♀, 26.VII.92: 1 ♂ 2 ♀♀; on *R. lutea*, 2.V.92: 2 ♂♂ 16 ♀♀; on *R. sphaerocarpa*, 25.V.92: 2 ♂♂ 8 ♀♀; on *S. vera*, 24.III.92: 1 ♂ 1 ♀; on *Triticum* sp., 8 ♂♂ 16 ♀♀, 20.VI.92: 2 ♂♂ 4 ♀♀ 2 larvae. Total: 22 ♂♂ 81 ♀♀ 2 larvae.

Haplothrips vuilleti Priesner, 1920

Distribution: Europe and Turkey. Recorded from the area by Berzosa & Maroto (1986) who collected 1 ♂.

Hoplandrothrips sp. (*)

Material examined: By sweeping: on *S. chamaecyparissus*, 20.XII.92: 1 ♀. Total: 1 ♀.

Megathrips sp. (*)

Material examined: By sweeping: on *Q. coccifera*, 23.VII.92: 1 larva. Total: 1 larva.

Neoheegeria dalmatica Schmutz, 1909 (*)

Distribution: Turano-Mediterranean.

Material examined: By sweeping: on *J. thurifera*, 21.VII.91: 1 ♂. Total: 1 ♂.

RESULTS

Most of the species collected are commonly found on or in the flowers of bushes or herbs or grasses (*Aeolothrips*, *Melanthrips*, *Rhipidothrips*, *Anaphothrips*, *Chirothrips*, *Frankliniella*, *Oxythrips*, *Odontothips*, *Limothrips*, *Haplothrips*, *Thrips*, *Tenothrips*, *Stenothrips*, etc), with some of them colonising other parts of the plants. Some, like *Scirtothrips inermis*, favour leaves and fruits, both young and mature, rather than flowers (Lacasa et al., 1996).

The species of the genera *Bolothrips*, *Compsothrips*, *Apterygothrips*, *Allothrips* and *Cephalothrips* are usually found either on plant remains in the ground, or on the bark of trees, on account of their mostly mycophagous diet.

Regarding the collecting methods, coloured dishes and plant sweeping proved to be most effective (Table I), both from a qualitative and a quantitative point of view. The sweeping method is a good way to know what species colonise the various members of the plant communities and the degree of dependency on their hosts plants, bearing in mind that most of the species are phytophagous.

Interception methods have proved less effective (Table I), since they are useful only for active winged specimens and are passive attraction traps which, unlike coloured dishes, do not attract specimens actively.

As was to be expected, collection was at its minimum during the winter (Table 2), and peaked in the summer. *Th. tabaci*, *Te. discolor*, *Li. cerealium* and *Me. fuscus* were taken all

year round. This is because either they remain active all throughout the year, or they hibernate as adults. Our data confirm that some species are indeed seasonal in their activity, as pointed by LACASA & LLORENS (1996). So, the active periods of such facultative predators as *Ae. intermedius*, *Ae. collaris*, *Ae. faciatus* or *Ae. tenuicornis* overlap with those of a number of phytophagous species, both monovoltine (*Ha. tritici*) and bivoltine (*Li. cerealium*, *Fr. occidentalis*, *Od. ignobilis*, *Th. meridionalis*, *Li. denticornis*, *Th. angusticeps* or *Fr. intonsa*) which multiply during the spring and the summer. The adults of some of these species can be active (*Me. fuscus* or *Li. cerealium*) during the winter. *Te. discolor* and *Te. frici* were the species taken most often; they may be representatives of a group of species, like *Th. physapus*, which are active during the summer and the autumn, although they are frequent and abundant as early as at the end of the spring.

40 % of all species found (Table 3) are either native to the Mediterranean area or occur near the Mediterranean, in marked contrast with the composition of the plant community, over 70 % of whose species are predominatly Mediterranean (MOLERO, 1988). However, ZUR STRASSEN (1988) found a similar proportion (45 %) of Mediterranean species after studying the thrips fauna of Andalusia (Spain). In the forest under consideration, the proportion of Mediterranean Heteroptera is somewhat larger (67.4 %) (RIBES *et al.*, 1997).

Our study of this *Juniperus thurifera* forest of Los Monegros shows that its thrips fauna is more diverse than was previously known (BERZOSA & MAROTO, 1986), and confirms the exclusive nature and rarity of some of the species that live in it, giving for ther proof of its great scientific and natural values and the need to preserve its high degree of biodiversity, currently threatened in many ways (PEDROCCHI, 1998).

SUMMARY

Este trabajo viene a completar algunos previos que inventarían la fauna de thrips de las comunidades vegetales asociadas a *Juniperus thurifera* L. permitiendo, dada la uniformidad en la periodicidad de trampeo, comparar la efectividad de las diferentes técnicas de recolección utilizadas y aportar información sobre la fenología y corología del grupo en la zona estudiada.

Se recogen los resultados obtenidos tras el muestreo llevado a cabo desde 1990 a 1994, principalmente, y en el sabinar de Los Monegros conocido como «Retuerta de Pina» (Pina de Ebro, Zaragoza). Las técnicas de trampeo de invertebrados utilizadas, y que han resultado válidas para recolectar thrips, han sido: una **trampa Moericke** (amarilla por dentro y verde por fuera, con unas dimensiones de 60×60×10 cm., colocada a una altura de 70 cm y llenada con agua jabonosa); 25 **platos de colores** (platos de plástico de color amarillo, azul o blanco, con unas dimensiones de 26×16×4 cm y colocados sobre el suelo); dos **trampas Malaise**; **barrido** sobre plantas y cuatro **trampas Wilkening** (con unas dimensiones de 32 cm de alto × 11 de ancho). En la elaboración de las tablas aportadas se ha excluido el material colectado por las técnicas de trampeo que no han sido utilizadas durante un año calendario completo y aquellas citas que, para los demás sistemas, sobrepasaban ese periodo.

Se han colectado un total de 6.866 especímenes pertenecientes a 69 especies y 29 géneros. Una especie, *Blascothrips zumetai*, es un género y especie recientemente descritos y, hasta donde conocemos, presente sólo en Los Monegros. Dos especies *Ankothrips mavromoustakisi* y *Haplothrips titschackianus* se citan para España por primera vez; 51 species, señaladas con un (*), son primeras citas para la provincia de Zaragoza y 36 especies, señaladas con dos (**), se citan por primera vez asociadas a comunidades vegetales de sabinar.

Los métodos de trampeo más efectivos (Tabla 1) han sido los platos de colores y el barrido en plantas, como corresponde a un grupo en el que gran parte de las especies son fitófagas y con apetencias florícolas. Las trampas de intercepción han resultado menos efectivas ya

Table 1. Number of thrips collected by different methods. Abbreviations: DS=coloured dishes; ML=Malaise trap; WK=Wilkening trap; SW=swept from plants.
Número de thrips colectados mediante diferentes métodos. Abreviaturas: DS=platos de colores; ML=trampa Malaise; WK= trampa Wilkening; SW=barrido en plantas.

	DS	ML	WK	SW	total
Ae. collaris Prs.	2	7	10	2	21
Ae. fasciatus (Linn.)	0	0	0	5	5
Ae. intermedius Bgn.	39	41	23	67	170
Ae. tenuicornis Bgn.	151	234	17	52	454
An. niezabitovskii (Schl.)	0	0	0	6	6
An. thuriferae Brz.} Mrt.	0	1	0	0	1
Me. fuscus (Slz.)	24	16	13	45	98
Me. knechteli Prs.	0	0	1	0	1
Rh. brunneus Wlm.	2	2	0	0	4
Rh. gratiosus Uzel	4	0	0	0	4
An. obscurus (Mll.)	0	0	0	2	2
Ch. aculeatus Bgn.	1	2	0	3	6
Ch. manicatus Hal.	0	0	0	6	6
Fr. intonsa (Trb.)	38	99	47	15	198
Fr. occidentalis (Perg.)	46	81	0	33	160
Fr. tenuicornis (Uzel)	0	6	13	0	19
Ka. firmoides Prs.	1	0	1	29	31
Li. cerealium Hal.	71	19	10	4	104
Li. denticornis Hal.	0	19	1	3	23
Od. ignobilis Bgn.	0	0	1	71	72
Od. ramadei Brn.	3	0	0	0	3
Od. ulicis Hal.	0	0	0	4	4
Ox. ajugae Uzel	0	0	1	14	15
Ox. bicolor (O.M.Rtr.)	0	0	2	2	4
Ox. perisi Brz.	5	14	0	0	19
Ox. sabinae Brz.	2	7	0	0	9
Sc. inermis Prs.	0	0	0	1	1
Se. bicornis (Krn.)	1	0	0	0	1
St. graminum Uzel	0	1	0	0	1
Te. discolor (Krn.)	965	13	17	23	1,018
Te. frici (Uzel)	327	16	172	90	605
Te. hispanicus (Bgn.)	0	0	0	21	21
Te. pallidivestis (Prs.)	4	0	4	0	8
Th. angusticeps Uzel	33	4	6	7	50
Th. atratus Hal.	0	0	1	2	3
Th. meridionalis (Prs.)	87	54	10	32	183
Th. nigropilosus Uzel	1	0	0	0	1
Th. physapus Linn.	2	0	108	0	110
Th. tabaci Ldm.	46	24	55	52	177
Th. trehernei Prs.	4	0	0	0	4
Ap. priesneri z.S.	2	0	0	0	2
Bo. cingulatus (Krn.)	0	0	0	2	2
Bo. icarus (Uzel)	0	0	0	7	7
Co. albosignatus (O.M.Rtr.)	0	0	1	7	8
Co. uzeli (Hood)	0	0	0	4	4
Ha. acanthoscelis (Krn.)	8	18	0	0	26
Ha. aculeatus (Fbr.)	0	1	0	0	1
Ha. niger (Osb.)	0	0	0	24	24
Ha. reuteri (Krn.)	36	11	4	0	51
Ha. setiger Prs.	0	0	0	112	112
Ha. tritici (Krd.)	0	0	12	22	34
total thrips	1,905	690	530	769	3,894
total species	27	23	24	33	51

Table 2. Number of thrips collected during the four seasons. Spring: March to May; Summer: June to August; Autumn: September to November; Winter: December to February.
Número de thrips colectados por estaciones. Primavera: de Marzo a Mayo; Verano: de Junio a Agosto; Otoño: de Septiembre a Noviembre; Invierno: de Diciembre a Febrero.

	Spring	Summer	Autumn	Winter	total
Ae. collaris Prs.	4	17	0	0	21
Ae. fasciatus (Linn.)	5	0	0	0	5
Ae. intermedius Bgn.	34	104	32	0	170
Ae. tenuicornis Bgn.	310	144	0	0	454
An. niezabitovskii (Schl.)	0	0	0	6	6
An. thuriferae Brz. & Mrt.	0	0	1	0	1
Me. fuscus (Slz.)	64	11	22	1	98
Me. knechteli Prs.	1	0	0	0	1
Rh. brunneus Wllm.	3	1	0	0	4
Rh. gratiosus Uzel	4	0	0	0	4
An. obscurus (Mll.)	1	0	0	1	2
Ch. aculeatus Bgn.	4	2	0	0	6
Ch. manicatus Hal.	5	1	0	0	6
Fr. intonsa (Trb.)	32	86	81	0	199
Fr. occidentalis (Perg.)	33	65	62	0	160
Fr. tenuicornis (Uzel)	4	13	2	0	19
Ka. firmoides Prs.	7	0	0	24	31
Li. cerealium Hal.	58	23	2	21	104
Li. denticornis Hal.	1	22	0	0	23
Od. ignobilis Bgn.	37	35	0	0	72
Od. ramadei Brn.	0	0	3	0	3
Od. ulicis Hal.	4	0	0	0	4
Ox. ajugae Uzel	5	0	0	10	15
Ox. bicolor (O.M.Rtr.)	4	0	0	0	4
Ox. perisi Brz.	3	0	0	16	19
Ox. sabinae Brz.	0	2	0	7	9
Sc. inermis Prs.	1	0	0	0	1
Se. bicornis (Krn.)	0	0	1	0	1
St. graminum Uzel	1	0	0	0	1
Te. discolor (Krn.)	158	268	585	7	1,018
Te. frici (Uzel)	67	423	115	0	605
Te. hispanicus (Bgn.)	0	0	2	19	21
Te. pallidivestis (Prs.)	7	0	0	1	8
Th. angusticeps Uzel	22	0	2	26	50
Th. atratus Hal.	1	0	0	2	3
Th. meridionalis (Prs.)	65	77	0	41	183
Th. nigropilosus Uzel	0	0	1	0	1
Th. physapus Linn.	0	91	19	0	110
Th. tabaci Ldm.	83	57	24	13	177
Th. trehernei Prs.	0	0	4	0	4
Ap. priesneri z.S.	1	0	0	1	2
Bo. cingulatus (Krn.)	0	0	2	0	2
Bo. icarus (Uzel)	1	5	1	0	7
Co. albosignatus (O.M.Rtr.)	2	5	1	0	8
Co. uzeli (Hood)	0	4	0	0	4
Ha. acanthoscelis (Krn.)	0	26	0	0	26
Ha. aculeatus (Fbr.)	0	1	0	0	1
Ha. niger (Osb.)	0	24	0	0	24
Ha. reuteri (Krn.)	11	34	6	0	51
Ha. setiger Prs.	8	99	5	0	112
Ha. tritici (Krd.)	34	0	0	0	34
total thrips	1,085	1,640	973	196	3,894
total species	37	27	22	16	51

Table 3. Chorology of thrips of the forest of Retuerta de Pina
Corología de los thrips del sabinar de Retuerta de Pina

CHOROLOGY	NUMBER OF SPECIES	PERCENTAGE
West-Palaearctic	10	14.9 %
Mediterranean	9	13.4 %
Palaearctic	8	11.9 %
Holarctic	7	10.4 %
Cosmopolitan	5	7.4 %
West-Mediterranean	5	7.4 %
Europe	5	7.4 %
Spain	5	7.4 %
Ponto-Mediterranean	3	4.4 %
Western Europe	2	2.9 %
Turano-Mediterranean	2	2.9 %
Ibero-Macaronesian	2	2.9 %
Turano-European	1	1.4 %
South-European	1	1.4 %
Indo-Mediterranean	1	1.4 %
Los Monegros region	1	1.4 %

que son útiles sólo para detectar especímenes alados activos y se comportan como técnicas pasivas.

Como era de esperar la recolección fue mínima en invierno y con un máximo en verano (Tabla 2). *Th. tabaci*, *Te. discolor*, *Li. cerealium* y *Me. fuscus* se capturan durante todo el año. Algunas especies son estacionales solapándose el periodo de actividad de taxones predadores como *Ae. intermedius*, *Ae. collaris*, *Ae. faciatus* o *Ae. tenuicornis* con el de fitófagos, tanto monovoltinos (*Ha. tritici*) como bivoltinos (*Li. cerealium*, *Fr. occidentalis*, *Od. ignobilis*, *Th. meridionalis*, *Li. denticornis*, *Th. angusticeps* o *Fr. intonsa*) que aparecen en primavera y verano. *Te. discolor* y *Te. frici* han sido las especies con mayor número de individuos colectados.

El 40 % de las especies citadas (Tabla 3) tienen c arácter mediterráneo, en contraste con el de la vegetación que alcanza un porcentaje del 70%, o grupos del mismo enclave, como Heteroptera, con el 67'4 %. Esta distribución coincide, en cambio, con el 45 % de especies mediterráneas de un inventario de thrips de Andalucía.

Nuestro estudio muestra que la fauna de thrips de este sabinar es más diversa de lo que se conocía previamente y confirma la rareza de alguna de las especies que viven en él, remarcanso sus valores ecológicos y científicos, así como la necesidad de proteger su alto grado de biodiversidad.

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