

ENRIQUE BAQUERO (\*) - RAFAEL JORDANA (\*)

THE GENUS *GONATOCERUS* NEES (HYMENOPTERA  
CHALCIDOIDEA MYMARIDAE) IN CORN FIELDS  
OF NAVARRA, NORTH SPAIN

Baquero E., Jordana R. - The genus *Gonatocerus* Nees (Hymenoptera Chalcidoidea Mymaridae) in corn fields of Navarra, North Spain.

Eight species of *Gonatocerus* Nees, 1834 (Hymenoptera Chalcidoidea Mymaridae) are added to the faunal list of Spain: *G. litoralis* (Haliday, 1833), *G. chrysis* Debauche, 1848, *G. thyrides* Debauche, 1848, *G. longior* Soyka, 1946, *G. sulphuripes* (Förster, 1847), *G. pictus* (Haliday, 1833), *G. minor* Matthews, 1986 and *G. ovicenatus* Leonard and Crosby, 1915. Species descriptions and details about their distribution and biology are also included. The name *G. tremulae* Bakkendorf, 1934 is synonymized under *G. ovicenatus*. The specimens were collected with a Malaise trap in Cadreita, and with a sweep net in sixty corn fields from 23 localities around Navarra.

KEY WORDS: Hymenoptera, Mymaridae, *Gonatocerus*, *Zea mays*, Navarra, Spain.

INTRODUCTION

*Gonatocerus* has a world-wide distribution with 251 valid species described, 47 in the Palaearctic Region (HUBER, 1986; NOYES and VALENTINE, 1989; ZEYA and HAYAT, 1995). In Europe there are 24 nominal species of *Gonatocerus* (HUBER, 1988). In Navarra corn is cultivated without insecticides because corn fields are surrounded by horticultural crops. A large number of mymarids (Chalcidoidea, Mymaridae) were captured in corn fields of Navarra, especially *Anagrus atomus* (Linnaeus, 1767) and *Gonatocerus litoralis* (Haliday, 1833). Mymaridae of the Iberian Peninsula have been inadequately studied. The objective of this work is to increase the knowledge of the family Mymaridae in Spain by providing figures and measurements, and to compare the specimens captured with those from other regions. The species mentioned here are first records for the region.

MATERIAL AND METHODS

The specimens were collected with a Malaise trap installed near corn

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(\*) Department of Zoology and Ecology, Faculty of Sciences, University of Navarra, P.O. Box 177, 31080 Pamplona, España (Spain). E-mail: ebaquero@unav.es

fields and peach trees in Cadreita (South of Navarra), from 18.6.1992 to 3.9.1992, and by sweeping corn plants with a net in sixty localities around Navarra, between 1992 and 1995. The captured specimens were mounted partially on slides with Hoyer medium. The rest of material were stored in ethanol. For the identification a optical microscope and a Scanning Electron Microscope (SEM) were used. The figure I shows the UTM grid with the situation of the sampling stations in Navarra. The studied material is deposited in the Department of Zoology and Ecology, Faculty of Sciences, University of Navarra, Spain.

List of abbreviations: F, funicular segment of female antenna or flagellar segment of male antenna; T, metasomal tergum.

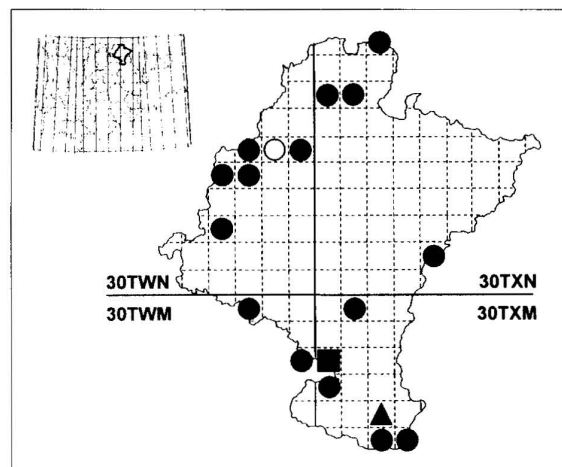


Fig. I

Location of the captures of *Gonatocerus* spp. in the UTM co-ordinates grid in Navarra: *Gonatocerus litoralis*, circles; *G. minor*, triangle; *G. ovicenatus*, white circle. Locality of Cadreita (square).

## RESULTS

Among 94,083 arthropods extracted from the samples, 7.72% were mymarids, 13.12% of which belonged to the genus *Gonatocerus* (18.65% from the Malaise trap samples and 5.62% from sweeping corn leaves). *G. litoralis* was the most abundant species (11.30% of the total number of mymarids in the Malaise trap samples and 5.59% from sweeping corn leaves). *Zyginidia scutellaris* (Herrich-Schäffer, 1838), was the most abundant cicadellid in corn fields, but *Macrosteles sexnotatus* (Fallén, 1806) and *Psammotettix alienus* (Dahlbom, 1951) were also present.

Table 1 - List of sampling stations with details of UTM co-ordinates and altitude.

Locality	UTM	Altitude (m)
Ablitas	30TXM1548	386
Alsasua	30TWN6749	584
Arbizu	30TWN7851	493
Arrayoz	30TXN1779	140
Bacaicoa	30TWN7449	515
Cadreita	30TXM0673	276
Calahorra (La Rioja)	30TWM9377	300
Caparroso	30TXM1090	321
Castejón	30TXM0771	273
Ciordia	30TWN6346	553
Cortes	30TXM2744	254
Echarren	30TWN9650	460
Echarri-Aranaz	30TWN7651	508
Huarte-Araquil	30TWN8655	471
Irañeta	30TWN8753	459
Lacunza	30TWN7952	491
Lodosa	30TWM7794	320
Murieta	30TWN6923	465
Sangüesa	30TXN4117	404
Santesteban	30TXN0876	123
Urdax	30TXN2191	95
Urdiain	30TWN7149	549
Villanueva de Araquil	30TWN8952	460

#### Genus *Gonatocerus* Nees, 1834

*Gonatocerus* Nees, 1834: 192.

Type species: *Gonatocerus longicornis* Nees, by monotypy.

The taxonomy of *Gonatocerus* is unsatisfactory at species level except for Britain (MATTHEWS, 1986), India (ZEYA and HAYAT, 1995) and, in part, for North America (HUBER, 1988), but there are clearly defined species-groups. HUBER (1988) gives a historical review of the genus.

DIAGNOSIS. Female antennal funicle with seven or eight segments. Funicle segments with a maximum of four sensory ridges each; clava with six to ten sensory ridges, sometimes more. Male flagellum with 11 segments, each with a variable number of sensory ridges depending on the species. Pronotum divided and propodeum with sculpture; different features of these two characters define the species groups. Propodeum with at least two longitudinal grooves. Dorsellum strap-like or rhomboidal in the species-groups present in Europe. Wings generally wide, three to five times longer than wide. Tarsi with five segments and foretibia with conical sensilla.

*Ooctonus* Haliday, 1833 is perhaps the most related European genus (five tarsal segments and eight segments in the funicle), but has a very long

gastral petiole and the pronotum entire.

Currently there are eight species-groups accepted for the genus: *litoralis*, *sulphuripes*, *ater*, *deficiens*, *straeleni*, *masneri*, *membraciphagus* (YOSHIMOTO, 1990) and *asulcifrons* (ZEYA and HAYAT, 1995).

In Europe only three species groups occur. The *litoralis* species-group is characterised by the pronotal lobes widely separated by a membranous area, dorsellum of metanotum strap-like, propodeum with denticles but without carinae, and discal microtrichia present behind venation of the forewing. The *sulphuripes* and *ater* species-groups are characterised by the pronotal lobes contiguous and the dorsellum of metanotum rhomboidal. They can be separated from each other as follows: *sulphuripes* species-group has the propodeum with a weak median carina or sometimes with two faint submedian carinae, and discal microtrichia present behind venation of the forewing, whereas *ater* species-group has the propodeum with well-developed submedian carinae and discal microtrichia of the forewing usually absent behind venation.

HOSTS. Leafhoppers (Homoptera, Cicadellidae) are the most common hosts, and membracids (Homoptera, Membracidae) are known hosts of the *membraciphagus* species-group of *Gonatocerus* (MATTHEWS, 1986; HUBER, 1988). Other hosts references are probably incorrect (HUBER, 1986, 1988).

**Key to females of *Gonatocerus* species founded in Navarra, Spain.**

- 1 Pronotum three-lobed; dorsellum of metanotum strap-like; propodeum with denticles but without carinae ..... (*litoralis*-group) 3
  - Pronotum two-lobed; dorsellum of metanotum rhomboidal; propodeum without denticles but with strongly or weakly developed carinae ..... 2
- 2 Disc of forewing with setae extending behind and proximal to the marginal vein; carinae only weakly developed on dorsal surface of propodeum ... (*sulphuripes*-group) 6
  - Disc of forewing bare behind marginal vein; well-developed carinae present on dorsal surface of propodeum ..... (*ater*-group) *G. ovicenatus*
- 3 Clava with only 6 sensory ridges ..... *G. chrysis*
  - Clava with 10 or more sensory ridges, always with more than 6 ..... 4
- 4 Setation of forewing between marginal vein and cubital line of hairs as dense as over the rest of the disc ..... *G. litoralis*
  - Setation of forewing between marginal vein and cubital line of hairs not as dense as over the rest of the disc ..... 5
- 5 Sensory ridges present only on F7 and F8 ..... *G. thyrides*
  - Sensory ridges present on F7, F8 and other funicle segments, specially on F5 ...  
..... *G. longior*
- 6 Ovipositor 1.4 times as long as midtibia; F6 with one or two sensory ridges; yellow and black when alive or dry-mounted ..... *G. pictus*
  - Ovipositor less than 1.4 times as long as midtibia; F6 without sensory ridges; light to very dark brown, with or without orange basal half of gaster when alive or dry-

- mounted ..... 7  
7 Forewing elongated with few and long marginal cilia; ovipositor/midtibia ratio 1.3-1.7; forewing length 0.70-0.95 mm ..... *G. minor*  
- Forewing broader, with more and shorter marginal cilia; ovipositor/midtibia ratio 1.0-1.4; forewing length 0.90-1.35 mm ..... *G. sulphuripes*

*litoralis* species-group

***Gonatocerus litoralis*** (Haliday, 1833)  
(Figs. I, II, 1; IV, 1 and VI, 1)

*Ooctonus litoralis* Haliday, 1833: 344.

*Gonatocerus litoralis* (Haliday): LAMEERE, 1907: 245.

DIAGNOSIS. Clava with 10 sensory ridges, forewing with uniform microtrichia density over the disc and a short ovipositor (1.06 times midtibia).

DESCRIPTION. Female. Colour. Head and mesosoma brown, eyes with a pale narrow edge, antenna pale brown with the radicle yellowish. Metasoma pale brown, with darker transversal stripes at the end of each tergite. Ventral side of the metasoma darker than the rest (valves and area near the ovipositor). Pronotum pale brown and mesoscutum yellowish in some specimens. Coxa and trocanter variable in colour and femur with a medial dark area. Tibia dark brown and tarsi with the last segment darker.

Head. Transverse, with four setae (2 + 2) between antennal toruli, mandibles with three teeth. Sensory ridges on F5(1), F7(1-2), F8(2) and clava(10). Spindle-shaped sensilla (fig. II) present on F5(1), F7(1) and F8(1).

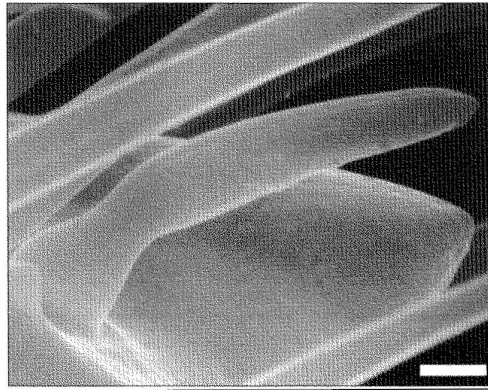


Fig. II.  
Spindle-shaped sensilla on female antennal F7 in *G. litoralis* (x10000; bar 1 mm).

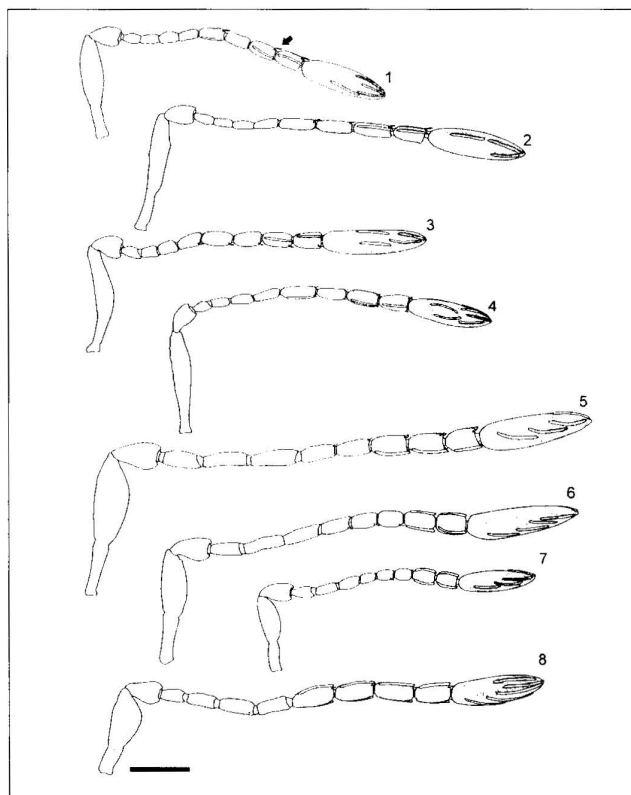


Fig. III.

*Gonatocerus* spp., female antenna, lateral view: 1, *G. litoralis* (the arrow points to the spindle-shaped sensilla of fig. II). 2, *G. chrysis*. 3, *G. thyrides*. 4, *G. longior*. 5, *G. pictus*. 6, *G. sulphuripes*. 7, *G. minor*. 8, *G. ovicenatus* (bar 0,1 mm).

Funicle segments progressively broader towards end (fig. III, 1).

Wings. Forewing (fig. IV, 1) with 70-80 marginal cilia and discal microtrichia uniformly covering the part next to marginal vein and with no space line. Hindwing with two rows of 9-10 microtrichia on the distal part and 40-45 marginal cilia.

Legs. Foretibia with 3-4 conical sensilla.

MALE. Coloration similar to female. Scape and pedicel paler than flagellum in some specimens. Flagellar segments similar in length and with 7-8 sensory ridges. Scape lightly scaly and pedicel smooth. Genitalia simple, with long aedeagal apodeme inserted on the posterior part. Parameres short and rounded (fig. VI, 1).

HOSTS. Recorded from *Cicadula* (= *Macrosteles*) *sexnotata* Fallén, 1806 and *Acocephalus* (= *Aphrodes*) sp. eggs (Homoptera, Cicadellidae) (MATTHEWS, 1986).

DISTRIBUTION. Described from England (HALIDAY, 1833), this species has been recorded from Germany, Austria, Belgium (DEBAUCHE, 1948), Romania, Australia and Japan (SAHAD and HIRASHIMA, 1984). This is the first record of this species from the Iberian Peninsula.

DISCUSSION. *G. litoralis* is the most frequent species found in the study, present in almost all the samples around Navarra. The measurements and colour pattern are very similar between the Iberian specimens and the British ones. Only some antennal segments of the female funicle appears longer in the later.

MATERIAL EXAMINED. Swept from corn plants: Cadreita, (16.07.1993, 2 females; 29.07.1993, 1 female), Caparroso (25.08.1993, 1 female), Castejón (25.08.1993, 1 female), Ablitas, (27.06.1994, 2 females), Cortes, (27.06.1994, 1 female), Lodosa, (19.07.1994, 1 female), Calahorra, (19.07.1994, 4 females), Santesteban, (20.07.1994, 3 females), Arrayoz, (20.07.1994, 3 females), Urdax, (20.07.1994, 4 females), Echarren, (20.07.1995, 32 females), Villanueva de Arakil, (20.07.1995, 9 females), Irañeta, (20.07.1995, 15 females, 2 males), Huarte-Araquil, (20.07.1995, 10 females, 1 male), Lacunza, (20.07.1995, 8 females, 1 male), Arbizu, (20.07.1995, 3 females), Echarri-Aranaz, (20.07.1995, 11 females), Bacaicoa, (20.07.1995, 31 females, 2 males), Urdiain, (20.07.1995, 4 females, 1 male), Alsasua, (20.07.1995, 7 females), Ciordia, (20.07.1995, 4 females), Murieta, (18.08.1995, 2 females, 2 males), Sangüesa, (29.08.1995, 1 male). E. Baquero leg.

Malaise trap: Cadreita, (30.06.1992, 21 females, 6 males; 20.07.1992, 2 females; 06.08.1992, 7 females; 26.08.1992, 16 females, 13 males; 03.09.1992, 1 male; 24.09.1992, 20 female, 5 males; 04.08.1992, 10 females; 26.08.1992, 12 female, 3 males; 03.09.1992, 10 females; 24.09.1992, 14 females; 07.10.1992, 10 females; 30.10.1992, 4 females). E. Baquero leg.

Other material: UK, Scotland, Perth, 1 female (BMNH MI006/1).

### *Gonatocerus chrysis* (Debauche, 1948)

(Figs. III, 2; IV, 2 and VI, 2)

*Lymaenon chrysis* Debauche, 1948: 99.

*Gonatocerus chrysis* (Debauche): MATTHEWS, 1986: 227.

DIAGNOSIS. Clava with six sensory ridges. Forewing narrow with long marginal cilia. Ovipositor about as long as foretibia.

DESCRIPTION. Female. Head brown, with vertex, face and gena paler. Head sutures with a yellowish band at both sides (very visible around the eye). Antenna uniformly light brown with radicle paler. Mesosoma brown with terga darker towards the middle. Legs uniformly light brown with the

Table 2 - Measurements (in mm) of some females captured in Navarra. Abbreviations: F1-F6, = funicular articles. FWL = length of forewing; FWW = width of forewing; L/W = length/width ratio of forewing; FLMC = longest marginal cilia of forewing. C/FWW = ratio of longest marginal cilia of the forewing/width of forewing. HWL = length of hindwing; HLMC, longest marginal cilia of hindwing. Tibia 2 = length of midtibia. Ovip. L = length of ovipositor. O/T2 = ratio of ovipositor/midtibia lengths.

	<i>G. litoralis</i>	<i>G. chrysis</i>	<i>G. thyrides</i>	<i>G. longior</i>	<i>G. sulphuripes</i>	<i>G. pictus</i>	<i>G. minor</i>	<i>G. ovicenatus</i>
Body	0.87-1.15* 0.98 ± 0.07	0.77-1.05 0.90 ± 0.07	1.02	1.31	1.26-1.31*	1.58	0.85	1.22
Scape	0.155-0.195 0.171 ± 0.011	0.175-0.230 0.192 ± 0.014	0.185	0.192	0.195-0.200	0.230	0.138	0.150
Pedicel	0.042-0.055 0.049 ± 0.003	0.050-0.060 0.052 ± 0.003	0.052	0.052	0.062-0.065	0.080	0.050	0.060
F1	0.020-0.030 0.028 ± 0.003	0.020-0.032 0.025 ± 0.003	0.030	0.030	0.052-0.060	0.062	0.032	0.040
F2	0.020-0.032 0.026 ± 0.004	0.025-0.036 0.027 ± 0.003	0.025	0.030	0.063-0.072	0.075	0.035	0.052
F3	0.023-0.032 0.029 ± 0.003	0.028-0.042 0.032 ± 0.004	0.030	0.039	0.068	0.073	0.038	0.062
F4	0.027-0.042 0.032 ± 0.004	0.030-0.057 0.039 ± 0.007	0.050	0.048	0.050-0.051	0.058	0.028	0.056
F5	0.038-0.050 0.043 ± 0.005	0.038-0.072 0.045 ± 0.009	0.045	0.065	0.043-0.047	0.053	0.029	0.070
F6	0.035-0.048 0.040 ± 0.003	0.040-0.070 0.043 ± 0.008	0.050	0.058	0.040-0.041	0.060	0.030	0.068
F7	0.036-0.050 0.038 ± 0.003	0.050-0.070 0.054 ± 0.007	0.050	0.060	0.050	0.060	0.038	0.065

(continued)



(Tab. 2 - continued)

	<i>G. litoralis</i>	<i>G. chrysis</i>	<i>G. thyrides</i>	<i>G. longior</i>	<i>G. sulphuripes</i>	<i>G. pictus</i>	<i>G. minor</i>	<i>G. ovicenatus</i>
F8	0.040-0.048 0.041 ± 7E-04	0.050-0.062 0.052 ± 0.004	0.047	0.055	0.048-0.050	0.051	0.038	0.060
Clava	0.138-0.140 0.139 ± 0.001	0.155-0.183 0.162 ± 0.009	0.180	0.160	0.190-0.220	0.180	0.135	0.153
FWL	0.68-0.94 0.81 ± 0.07	0.70-0.95 0.79 ± 0.06	0.88	0.91	1.11-1.15	1.28	0.82	1.18
FWW	0.21-0.28 0.23 ± 0.02	0.15-0.22 0.17 ± 0.02	0.30	0.30	0.29-0.31	0.36	0.20	0.42
L/W	2.89-4.00 3.39 ± 0.28	4.16-5.00 4.47 ± 0.26	2.93	3.03	3.68-3.83	3.56	4.10	2.81
FLMC	0.072-0.102 0.086 ± 0.008	0.095-0.130 0.115 ± 0.012	0.083	0.078	0.095-0.100*	0.100	0.090	0.08
C/FWW	2.35-3.59 2.81 ± 0.32	1.15-2.10 1.57 ± 0.23	3.61	3.85	2.90-3.16*	3.6	2.22	4.67
Tibia 2	0.210-0.290 0.249 ± 0.019	0.230-0.300 0.249 ± 0.022	0.27	0.31	0.34-0.36	0.38	0.23	0.38
Ovip. L	0.240-0.285 0.262 ± 0.010	0.225-0.330 0.250 ± 0.031	0.34	0.59	0.38-0.40	0.62	0.32	1.060
O/T2	0.88-1.29 1.06 ± 0.09	0.94-1.10 1.00 ± 0.05	1.26	1.90	1.06-1.15	1.63	1.39	2.79
Min-max	n=18	n=18	n= 1	n=1	n= 3	n= 1	n= 1	n= 1
Mean ± Sd	*n=16				*n=2			

last tarsal segment dark. Metasomal terga light brown with the distal part darker. Ovipositor plates dark brown.

Face with 3 + 3 intertorular setae. Sensory ridges on F5(0-1), F6(0-1), F7(2) and F8(2). Spindle-shaped sensilla on F5, F6, F7 and F8, always on the same side. F8 with a row of setae and truncated laterally. Clava with six sensory ridges, four of them in the apical third, and pointed towards exterior (fig. III, 2).

Wings. Forewing (fig. IV, 2) with 70-75 marginal cilia and cubital line of microtrichia of 18-20. Density of discal microtrichia under marginal vein only a little less than beyond venation. Hindwing shorter than forewing and often without discal microtrichia, pointed at the end and with 50 marginal cilia.

Legs. Coxa reticulate, femur and tibia striated. Foretibia with 3-6 conical sensilla.

Metasoma. Ovipositor not exerted beyond metasomal apex.

MALE. Colouration similar to female, with the antennal pedicel and scape lighter. Scape lightly scaly and pedicel smooth. Flagellomeres each with eight sensory ridges. Foretibia with more than six conical sensilla. Genitalia similar to *G. litoralis* but with parameres longer and sharp at the end (fig. VI, 2).

HOSTS. Unknown (MATTHEWS, 1986).

DISTRIBUTION. Described from Belgium, where it is not common (DEBAUCHE, 1948) and cited from England and Wales (MATTHEWS, 1986). This is the first record for the Iberian Peninsula.

DISCUSSION. This species is less abundant than *G. litoralis* and so far was only found in Cadreita. The specimens from Navarra and England are very similar in measurements.

MATERIAL EXAMINED. Malaise trap: Cadreita, 30TXM0673 (30.06.1992, 2 females, 2 male; 20.07.1992, 2 males; 06.08.1992, 3 females; 26.08.1992, 20 females, 1 male; 03.09.1992, 2 females; 24.09.1992, 1 female; 04.08.1992, 1 female; 26.08.1992, 1 female; 03.09.1992, 1 female; 24.09.1992, 3 females; 07.10.1992, 2 females; 30.10.1992, 1 female). E. Baquero leg.

Other material: UK, England, Hampshire, 1 female (BMNH MI088/8).

### *Gonatocerus thyrides* (Debauche, 1948)

(Figs. III, 3 and IV, 3)

*Lymaenon thyrides* Debauche, 1948: 101.

*Gonatocerus thyrides* (Debauche): MATTHEWS, 1986: 223.

DIAGNOSIS. Sensory ridges present on F7(1), F8(2) and clava(10) and density of microtrichia next to marginal vein less than in the rest of the forewing.

DESCRIPTION. FEMALE. Colour. Head, antenna, mesosoma and legs

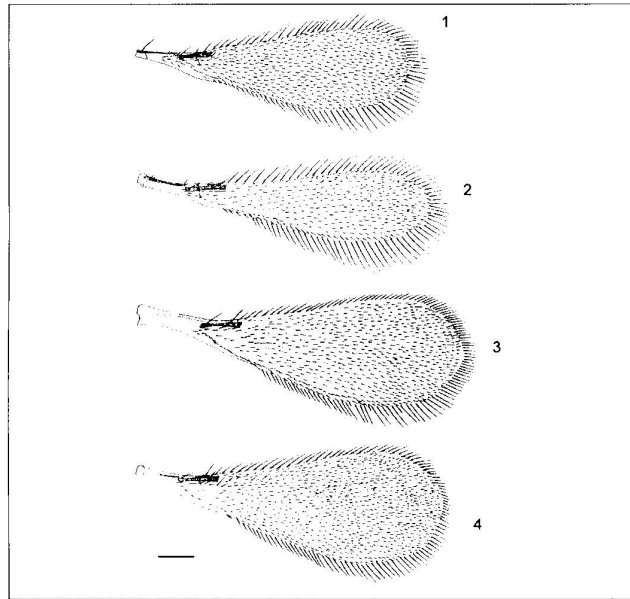


Fig. IV.

*Gonatocerus* spp., forewings: 1, *G. litoralis*. 2, *G. chrysis*. 3, *G. thyrides*. 4, *G. longior* (bar 0,1 mm).

dark brown except for articulations. Perimeter of the terga, especially in metasoma, paler than the rest. Ovipositor valves and apical tarsal segment very dark.

Head. Face with 2+2 intertorular setae. Antennal scape very slender and scaly. Pedicel smooth. Sensory ridges on F7(1) and F8(2). Spindle-shaped sensilla on F4(1), F5(2), F6(2), F7(2) and F8(2). F8 with a row of setae around distal low neck. Clava with ten sensory ridges, six of them in the apical third (fig. III, 3).

Wings. Forewing (fig. IV, 3) with 112 very short marginal cilia and cubital line of microtrichia ending at the posterior margin; the rest of the blade uniformly covered. Hindwing with 60 marginal cilia, relatively longer than other species of the genus, with anterior margin curved and posterior margin straight to the apex.

Legs. Foretibia with seven conical sensilla.

Metasoma. Petiole two times as wide as long and slightly conical. Ovipositor not exerted beyond metasomal apex and with four long setae on the external valves.

HOSTS. Unknown (MATTHEWS 1986).

DISTRIBUTION. Belgium and England (MATTHEWS, 1986). First record

for the Iberian Peninsula.

DISCUSSION. This species could be confused with *G. litoralis* by the absence of the sensory ridge on F5, but the wing is wider and the position of the microtrichia behind venation is different. The forewing dimensions are slightly different between specimens from Navarra and England (longer in the later). The rest are very similar.

MATERIAL EXAMINED. Malaise trap: Cadreita, 30TXM0673 (24.09.1992, 1 female). E. Baquero leg.

Other material: UK, England, Cambridgeshire, 1 female (BMNH MIII9/2).

*Gonatocerus longior* Soyka, 1946  
(Figs. III, 4 and IV, 4)

*Gonatocerus longior* Soyka, 1946a: 38.

DIAGNOSIS. This species is distinguished by the long ovipositor, exerted beyond the metasomal apex. The forewing has a bare area behind the marginal vein.

DESCRIPTION. FEMALE. Head dark brown except the sutures, and eyes bright red. Scape and pedicel darker externally, funicle and clava paler than scape. Mesosoma dark brown with medial part of mesoscutum and posterior scutellum darker. First third of coxa, mid and hindtibia, and last two tarsomeres brown. The rest of body yellowish including legs and metasoma, with T5, T6 and T7 dark-banded. Valves of ovipositor dark brown.

Head. Face with 5 + 5 intertorular setae. Sensory ridges on F5(1), F7(2), F8(2, not opposite) and clava(10). Spindle-shaped sensilla on F5(1), F6(1), F7(1) and F8(2). F8 with an apical low neck (fig. III 4).

Wings. Forewing (fig. IV, 4) long with 115 short marginal cilia. Discal setae uniformly distributed from almost first third of wing.

Legs. Foretibia with 6-7 conical sensilla.

Metasoma. External ovipositor valves with 2 + 7 setae. Metasoma length: 0.64 mm.

HOSTS. Unknown.

DISTRIBUTION. Holland (from where it was described), Austria and England (SOYKA, 1946a; MATTHEWS, 1986). This is the first record from the Iberian Peninsula.

DISCUSSION. Only one difference has been found between the Iberian specimen and the British one: the presence of two sensory ridges on F7 (there is only one in the later). The measurements of appendages and body are very similar.

MATERIAL EXAMINED. Malaise trap: Cadreita, 30TXM0673 (03.09.1992, 1 female). E. Baquero leg.

Other material: UK, England, Herefordshire, 1 female (BMNH MI038/1).

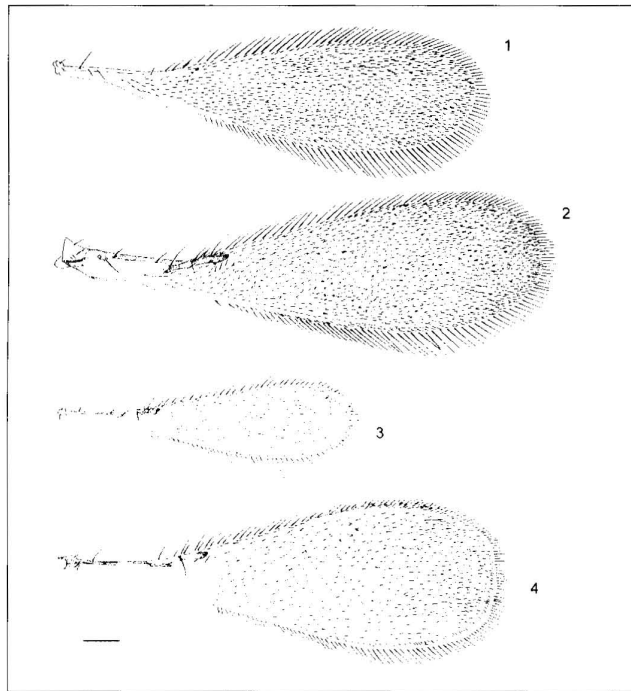


Fig. V.

*Gonatocerus* spp., forewings: 1, *G. sulphuripes*. 2, *G. pictus*. 3, *G. minor*. 4, *G. ovicenatus* (bar 0,1 mm).

*sulphuripes* species-group

***Gonatocerus sulphuripes*** (Förster, 1847)  
(Figs. III, 6 and V, 1)

*Rachistus sulphuripes* Förster, 1847: 204.

*Gonatocerus sulphuripes* (Förster): SCHMIEDEKNECHT, 1909: 492.

*Lymaenon sulphuripes* (Förster): BAKKENDORF, 1934: 29.

*Gonatocerus pictosimilis* Soyka, 1946a: 38.

*Lymaenon alecto* Debauche, 1948: 105.

*Lymaenon crassipes* Debauche, 1948: 109.

*Lymaenon synaptus* Debauche, 1948: 108.

DIAGNOSIS. This species is characterised by the ovipositor relatively short, F6 without sensory ridges and forewing broad (0.9-1.35 mm), with short marginal cilia. The ovipositor length to mid tibia ratio is 1.0-1.4. The species is very variable in colouration and sensory ridge number on funicle

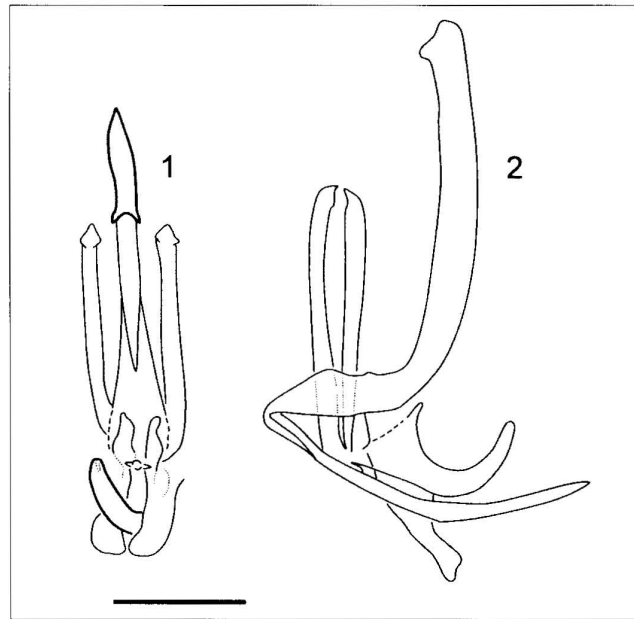


Fig. VI.

*Gonatocerus* spp., male genitalia: 1, *G. litoralis* (ventral view). 2, *G. chrysis* (lateral view) (bar 0.05 mm).

segments. Small specimens can be confused with *G. minor*, but *G. sulphuripes* has broader wings, shorter marginal cilia, and a shorter ovipositor (MATTHEWS, 1986).

DESCRIPTION. FEMALE. Head, antenna and mesosoma dark or very dark brown. Legs and basal half of metasoma lighter than mesosoma, sometimes reddish. Rest of metasoma dark brown.

Head. Antennal segments with sensory ridges on F7(2), F8(2) and clava (8) arranged in two series (fig. III, 6).

Wings. Forewing (fig. V, 1) broad, with 110 very short marginal cilia and microtrichia uniformly distributed, including behind the venation.

Metasoma. Terga with reticulation very clear behind the setal insertions. Each tergum with laterally 3-5 setae. External plate with three setae. Ovipositor slightly exerted beyond the metasomal apex.

DISTRIBUTION. England (FÖRSTER, 1847; MATTHEWS, 1986), Denmark (BAKKENDORF, 1934), Belgium (DEBAUCHE, 1948), Poland and Germany (SOYKA, 1946b) and Japan (SAHAD and HIRASHIMA, 1984). First record for the Iberian Peninsula.

HOSTS. Unknown.

DISCUSSION. We have compared the measurements of three specimens captured in Navarra with other similar measurements in references and also with the British one and found no significant differences between them.

MATERIAL EXAMINED. Malaise trap: Cadreita, 30TXM0673 (24.09.1992, 3 females).

Other material: UK, England, Avon, 1 male (BMNH MI080/7).

*Gonatocerus pictus* (Haliday, 1833)  
(Figs. III, 5 and V, 2)

*Ooctonus pictus* Haliday, 1833: 344.

*Gonatocerus pictus* (Haliday): SCHMIEDEKNECHT, 1909: 492.

*Gonatocerus flavus* Förster, 1841: 45.

*Lymaenon pictus* (Haliday): WALKER, 1846: 51.

*Rachistus pictus* (Haliday): FÖRSTER, 1847: 205.

DIAGNOSIS. This species is characterised by a short ovipositor and presence of a sensory ridge on F6.

DESCRIPTION. FEMALE. Head dark brown, especially the basal half. Antenna dark brown except the pedicel, lighter on its apex; scape yellowish with dark areas. Anterior half of mesosoma yellowish except the mesoscutum that is darker in its medial part. Posterior half of mesosoma dark brown except the apex. Propodeum very dark. Legs yellow except the last two tarsomeres and the basal half of medial and hind coxa. Mid and hindfemur and hindtibia with dark brown areas. Metasoma yellow with three yellow stripes on T6, T7 and T8 and two oval dark brown areas at both sides of the ovipositor. Ovipositor valves dark brown.

Head. Face with 1 + 1 intertorular setae. Sensory ridges on F6(2), F7(2) and F8(2), always on opposite sides of the segment. Clava with eight sensory ridges (4 + 4). Spindle-shaped sensilla on F4(1), F5(2), F6(2), F7(2) and F8(2). Last funicular segment without apical low neck (fig. III, 5).

Wings. Forewing (fig. V, 2) long and apically rounded, with over 120 marginal cilia. Discal setae uniformly distributed from the base of marginal vein. Cubital row reaching the midpoint of the posterior margin of the wing. Hindwing without discal setae (only two or three on the apex), with approximately 80 marginal cilia.

Legs. Foretibia with seven conical sensilla and a row of 10-11 setae on midfemur.

Metasoma. External plate of ovipositor with two apical and three basal setae.

HOSTS. Unknown.

DISTRIBUTION. England and Wales (MATTHEWS, 1986), Austria (SOYKA, 1941), Belgium (DEBAUCHE, 1948) and West Europe (TRJAPITZIN, 1978). This is the first record for the Iberian Peninsula.

MATERIAL EXAMINED. Malaise trap: Cadreita, 30TXM0673

(26.08.1992, 1 female). E. Baquero leg.

Other material: UK, England, Surrey, 1 female (BMNH MI084/1).

***Gonatocerus minor* Matthews, 1986**

(Figs. III, 7 and V, 3)

*Gonatocerus minor* Matthews, 1986: 220.

DIAGNOSIS. This species is characterised by its ovipositor relatively short, F6 without sensory ridges and a narrow forewing with long marginal cilia.

DESCRIPTION. FEMALE. Head, mesosoma and posterior half of metasoma dark brown. Antenna, legs and basal half of metasoma light brown or reddish.

Head. Radicle very long. Antennal funicular segments very short. Sensory ridges on F7(0-2), F8(2) and clava (8). Two spindle-shaped sensilla on F6, F7 and F8. Clava with eight sensory ridges (4 + 4) (fig. III, 7).

Wings. Forewing (fig. V, 3) with 84 marginal cilia and very narrow, uniformly covered with microtrichia. Marginal and stigmal vein very long.

Metasoma. Posterior half conical. Terga with a longitudinal reticulate pattern. Posterior half of ovipositor valves with two setae. Each metasomal tergum with a row of three setae laterally.

DISTRIBUTION. England (MATTHEWS, 1986). This is the first record for the Iberian Peninsula.

HOSTS. Unknown.

DISCUSSION. *G. minor* is very similar to and easily confused with *G. sulphuripes*, but it can be recognised by the forewing proportions and the ovipositor length. The measurements of the specimen from Navarra and the paratype from England are very similar.

MATERIAL EXAMINED. Malaise trap: Fustiñana, 30TXM2454 (11.08.1989, 1 female). E. Baquero leg.

Other material: UK, England, Surrey, 1 female (BMNH MI036/4, paratype).

*ater* species-group

***Gonatocerus ovicenatus* Leonard and Crosby, 1915**

(Figs. III, 8 and V, 4)

*Gonatocerus ovicenatus* Leonard and Crosby, 1915: 545.

*Gonatocerus tremulae* Bakkendorf, 1934: 30-33. New synonymy.

*Lymaenon ovicenatus* (Leonard and Crosby): BURKS, 1958: 63.

DIAGNOSIS. This species is characterised by the ovipositor exerted about 0.3 times its length beyond the metasomal apex, its apex distinctly bent downwards, and the forewing without microtrichia behind venation.



DESCRIPTION. FEMALE. Head, antenna, mesosoma, and metasoma dark brown or black. Scape and pedicel lighter than funicle and clava. Coxae very dark and last two tarsomeres almost black. Upper side of head and distal part of forefemur paler. Wings completely transparent with a brown narrow margin.

Head. Face with 1 + 1 intertorular setae. Antenna with sensory ridges on F5(2), F6(1-2), F7(2) and F8(2). Clava with eight sensory ridges (4 + 4) and a small apical spiny-like seta. F5-F8 each with one spindle-shaped sensillum (fig. III, 8).

Mesosoma. Propodeal spiracle large and ovoid, with a surrounding ridge. Dorsellum rhomboidal, propodeal carina complete, reaching dorsellum anteriorly.

Wings. Forewing (fig. V, 4) with 150 marginal cilia and very broad, 2.81 times as long as wide. Microtrichia uniformly covering the wing beyond marginal vein (only 2-3 small microtrichia next to marginal vein). Submarginal vein with two small hypochaetae, and marginal vein with three marginal microtrichia. Microtrichia smaller and more numerous towards wing apex.

Legs. Foretibia with 7-8 short and wide conical sensilla.

Metasoma. Ovipositor long with its final third exerted beyond metasomal apex and its apex bent down. Metasoma length: 0.65 mm.

DISTRIBUTION AND HOSTS. Denmark, Italy, ?USA (probably not established), and Iran. *G. ovicenatus* was described from New York (USA) from eggs of *Rhytidotus decimusquartus* (Schrank, 1776) (Homoptera, Cicadellidae) (= *Idiocerus scurra* Ferrière and *Idiocerus gemmisimulans* Leonard and Crosby, 1915) on *Populus deltoides* Marsh, 1785 and *Populus nigra italica* Du Roi, 1772 (HUBER, 1988). Later it was recorded from Italy (VIGGIANI, 1969) on *Idiocerus* sp. VIGGIANI (1969), who saw the type of *L. tremulae* Bakkenforf, 1934, stated that the parasitoid and the host were imported together and accidentally into the United States. It has also been recorded from Iran (HUBER, 1988). This is the first record from the Iberian Peninsula.

DISCUSSION. *G. ovicenatus* shares with *G. tremulae* the long ovipositor, exerted a third of its length beyond the metasomal apex and the peculiar form of the ovipositor apex. The study of relative dimensions of antennal segments, number and position of sensory ridges and wings, and density-position of microchaetae on the wings shows no differences. The measurements of *G. ovicenatus* specimens from Iran (HUBER, 1988) and *G. tremulae* (MATTHEWS, 1986; VIGGIANI, 1969) are very similar. As a result, the two species are synonymized.

MATERIAL EXAMINED. Corn plant: Irañeta, 30TWN8753 (20.07.1995, 1 female). E. Baquero leg.

Other material: *G. ovicenatus*, USA, New York, Ithaca (Cornell Univ., paratype female n°: 444); Iran, 1 female (BMNH, J.T. Huber leg.); Iran, 1 female and 1 male (Coll. Huber, J.T. Huber leg.); *G. tremulae* UK, England,

Bucks, 1 female (BMNH MIII8/1). The type material of *G. tremulae* from Denmark (Zoological Museum, Copenhagen) is lost (Dr. R. Meier, pers. comm.)

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#### RIASSUNTO

##### *IL GENERE GONATOCERUS NEES (HYMENOPTERA, CHALCIDOIDEA, MYMARIDAE) IN CAMPI DI GRANTURCO DI NAVARRA (NORD DELLA SPAGNA)*

Con questo studio otto specie appartenenti al genere *Gonatocerus* Nees vengono associate alla fauna della Spagna. Vengono descritte le specie *G. litoralis* (Haliday, 1833), *G. chrysis* (Debauche, 1848), *G. thyrides* (Debauche, 1848), *G. longior* Soyka, 1946, *G. sulphuripes* (Förster, 1847), *G. pictus* (Haliday, 1833), *G. minor* Matthews, 1986 e *G. ovicenatus* Leonard and Crosby, 1915, includendo informazioni riguardanti la biologia e la distribuzione delle specie.

*G. tremulae* (Bakkendorf, 1934) viene anche citata come *G. ovicenatus*. Gli esemplari vennero catturati utilizzando una trappola 'Malaise', posta a Cadreita, e utilizzando una manica entomologica collocata in 60 campi di mais distribuiti in 23 luoghi della provincia della Navarra.

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