The Taxon *Rasivalva* (Hymenoptera: Braconidae) in the Palaearctic Region and Description of *Rasivalva pyrenaica* New Species from Andorra[1]

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Abstract *Rasivalva* appears to be an uncommon genus, although it is nearly cosmopolitan with the exception of the Australian continent. Five species have been recorded from Europe and Crimea. In this paper, *Rasivalva pyrenaica* n. sp. is described as the most southern Palaearctic record of this genus, as well as the first record of the genus from Iberian Peninsula. An identification key is proposed for the Palaearctic species.

Key Words Braconidae, Microgastrinae, Cotesiini, *Rasivalva*, new species, parasitoid, Andorra, Iberian Peninsula

The genus *Rasivalva* was created by Mason (1981) to house the species *Microplitis stigmaticus* Muesebeck, 1922 and close relatives, and it was placed in the tribe Cotesiini (Microgastrinae). This taxon appears to be a rather rare genus. Although it is nearly cosmopolitan (not Australian), the species is most numerous in the New World. By 1981, three Palaearctic species were assigned to this genus: *Rasivalva calceata* (Haliday, 1834) and *Rasivalva marginata* (Nees, 1834) from western Europe, and *Rasivalva circumvecta* (Lyle, 1918) from England and Finland (van Achterberg 1997, Mason 1981). Later, two species were described: *Rasivalva desueta* Papp, 1989 from Switzerland and *Rasivalva karadagi* Tobias, 1986 from Crimea (Papp 1989, Tobias et al. 1986).

The three older European species were described originally in dissimilar genera to *Microplitis* Foerster, 1862, namely: *Microgaster calceatus* Haliday, 1834, *Microgaster marginatus* Nees, 1834 and *Diolcogaster circumvectus* Lyle, 1918 (Haliday 1834, Lyle 1918, Marshall 1885, Telenga 1955).

The present study is framed inside a wide sampling of the entomofauna of an area with marked Mediterranean character from the south slope of the Pyrenees, Santa Coloma in Andorra (Pujade-Villar 1996). The valley of the Gran Valira, where this town is located, constitutes a transition zone toward the Central European or alpine regions of higher altitude. The Iberian Peninsula, of which Andorra is a part, is one of the most peculiar areas of the Palaearctic region. Its relative isolation from the remainder of Europe, owing to the Pyrenees, as well as its proximity to Africa, makes

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it one of the most interesting centers of speciation in the Mediterranean area (Quézel 1978, López Martínez 1989).

Among the Braconidae collected during 1993 in the Andorran Pyrenees through sampling by Malaise trap, one specimen of *Rasivalva* that was found differed from all other known species. Because of the rareness of this genus, we propose a new species of *Rasivalva* with one female only, which is formally described in this paper.

The previously described trap is a passive sampling method that has been used in studies of biodiversity and phenology of the Hymenoptera. However, in the case of Braconidae, it proves unsuitable in gathering reliable and accurate information on the relationships between parasitoids and hosts (Sanchis et al. 1999). All host records thus far assembled suggest that *Rasivalva* spp. are solitary koinobiont parasitoids of Macrolepidoptera (Geometridae, Noctuidae and Arctiidae) (Mason 1981). Particularly in Europe, the hosts recognized belong to Geometridae, but are unknown for *R. karadagi* and *R. desueta*.

The specimen of *Rasivalva* was captured when one of the peaks of abundance of the main groups (Braconidae included) was collected in the second part of the spring. This characteristic peak of abundance is due to the xerothermic conditions of the locality (Pujade-Villar 1996, Segade et al. 1997). *Rasivalva* had never been found in numerous samplings by sweeping, Malaise trap or direct sampling over host plants conducted in Spain from 1960s to present, mainly in the Mediterranean zone. (Jiménez et al. 1996, Moreno-Marí et al. 1999, Oltra Moscardó and Michelena Saval 1988a, 1988b, 1988c, 1988d). This work constitutes both the most southern Palaearctic record and the first record from Iberian Peninsula of this genus. A key to the six western Palaearctic species is proposed, to complete the previous key by Tobias et al. (1986).

Rasivalva pyrenaica Oltra and Jiménez, n. sp.

FEMALE. - Head: In dorsal view 1.85 times as broad as long, eye 0.9 times as long as temple, latter rounded. Eye in lateral view 1.65 times as high as wide and 1.7 times as wide as temple. Ocelli round, distance between fore and a hind ocellus shorter than diameter of an ocellus, posterior tangent to anterior ocellus without touching the posterior ocelli, OOL shorter than 2x diameter of an ocellus, POL twice as long as distance between fore and hind ocellus and scarcely shorter (0.9x) than OOL. Face wider than high (1.32x), inner margin of eyes virtually parallel. Malar space as long as basal width of mandible. Tentorial pits nearer to margin of eye than to each other (1:2). Head and face appearing rugose due to large and crowded punctuation, head rugulose in vertex. First, second and third flagellomeres 3.0-3.5 and 3.3 times as long as broad respectively. Flagellomeres 15 and 16 similar in length (Fig. 1.B), nearly 2 times as long as wide, flagellomere 17 a little shorter (1.8x). As far as it is possible to observe with the stereomicroscope (128x), all antennal segments with 2 ranks of sensillae ("placodes").

Mesosoma: In lateral view 1.4 times as long as high. Mesonotum between tegulae somewhat broader than width of head. Prescutellar furrow deep with seven crenulae. Anterior margin of the postscutellum not closely applied to the posterior margin of the scutellum so that the phragma is distinctly visible. Scutellum in lateral view convex regularly. Mesonotum, scutellum (entirely and coarsely) and mesopleuron (anteriorly) rugose, i.e., dense punctuation confluent giving an impression of rugosity, dull. Notauli indicated by crowded sculpture. Pronotum uneven to rugulose, subshiny. Me-

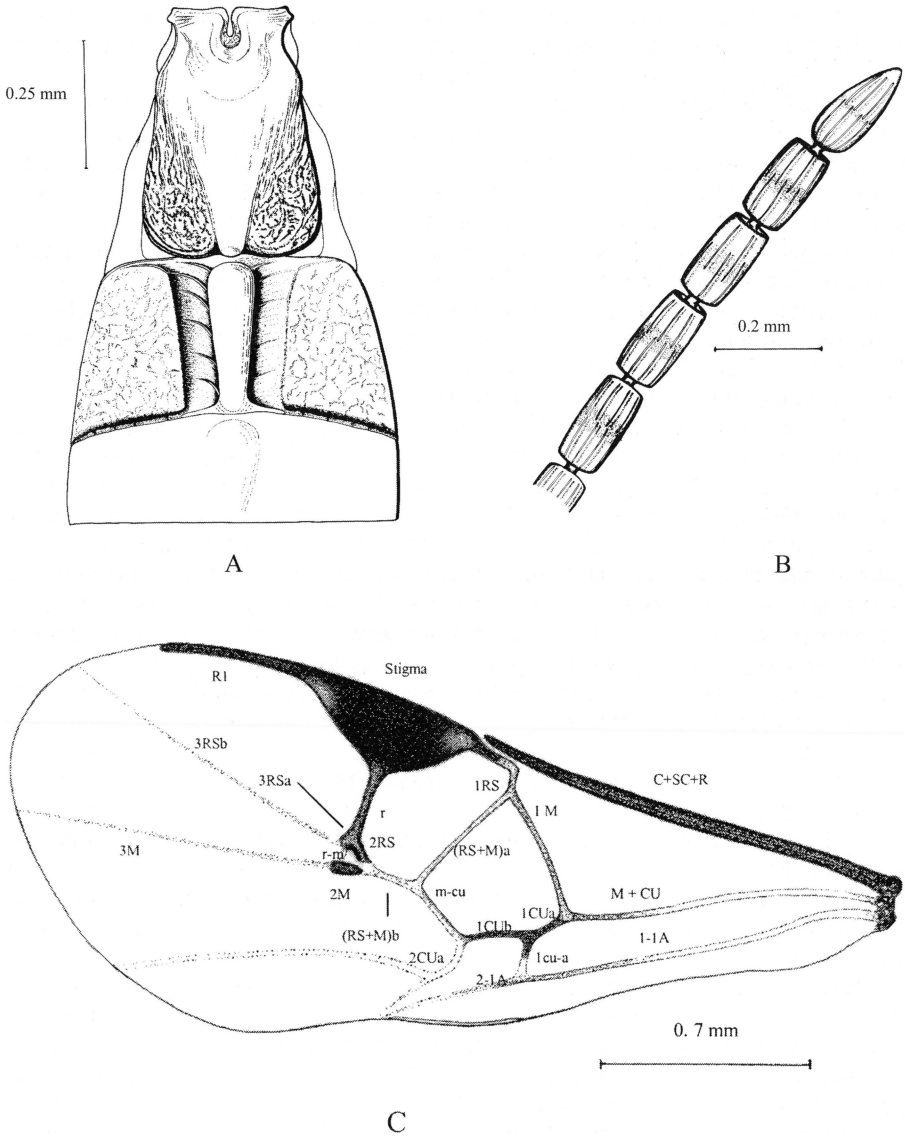

Fig. 1. Rasivalva pyrenaica. A – tergites I, II and III, holotype ♀; B – apical flagellomeres, holotype ♀; C – left fore wing (nomenclature of veins adopted in Wharton et al., 1997), holotype ♀.

sopleuron dorsoposteriorly polished. Metapleuron very rugose. Precoxal sulcus crenulate. Postscutellum polished wholly without rugosities. Propodeum scrobiculate with a medio-longitudinal keel more raised anteriorly and with a narrow, smooth and shiny band basally.

Legs: Hind coxa 2.6 times as long as high. Hind femur 3.8 times as long as broad. Hind tarsus 1.2 times as long as hind tibia. Spurs of hind tibia subequal in length, inner spur longer than outer and shorter than half basitarsus.

Wings (Fig. 1.C): Stigma 2.5x as long as wide, issuing radial vein from its middle basally; r nearly as long as 2.5 times 2RS, perpendicular to fore margin of stigma and lightly shorter than width of stigma. Metacarpus (R1) approximately one-fourth shorter than stigma and 1.6 times as long as distance between its distal end and tip of radial cell. Vein 1RS of fore wing pointed to vein 1Cub; second submarginal cell (areolet) quadrangular, extremely small, almost as wide as width of veins, nearly equilateral triangle-shape because of shortness of 3RSa, 2RS approximately as long as 2M; 1Cub (second section of discoideus, d2) twice as long as 1CUa (first section of discoideus, d1) in left wing or nearly 2x as 1CUa (right wing); 1cu-a almost straight, i.e., faintly arched. Vannal lobe of hind wing convex and hairy.

Metasoma (Fig. 1.A): One fifth shorter than mesosoma. First tergite slightly broadening posteriorly, its greatest hind breadth almost 1.5 times as great as its basal breadth, and nearly 1.4 times as long as its maximum hind breadth; tergite basally moderately excavated but without a medio-longitudinal furrow, its hind corners rounded. First tergite shining and slightly rugulose except two postero-lateral, triangular, rugose zones with basal more or less diagonal-longitudinal carinae delimiting a postero-central almost smooth V-shaped zone with apex rounded and as wide as 0.2 times hind width of tergite. Second tergite transverse, distinctly as wide at hind as twice long medially; with an elongated median area defined by a pair of subparallel wide grooves converging apically, median area as wide as 1/6 width of tergum II basally and as wide as nearly 0.1 width of tergum II distally. Tergite II rugulose with central area smooth almost polished and with transversely carinate in the grooves in its adjacent part to median field; apical margin of tergum II well marked and concave posteriorly. Tergite II nearly 1.3 times as long as tergite III, medially. Third tergite very slightly rugulose with a median area polished, poorly defined. Further tergites polished. Hypopygium evenly sclerotized, truncate apically, short, virtually not surpassing last tergite, the edge directed downward; ovipositor short and decurved; ovipositor sheath shing, short, tapered in distal third with a rounded apex upon which are a few minute setae, a little shorter than the depth of the sheath and smaller than setae of metasomal tergites.

Color: Head and mesosoma black. Antenna brownish fulvous lighter in its third distal, with scape black and pedicel brownish yellow. Labrus fulvous, mandibles yellowish fulvous, palpi mainly whitish with basal joint of maxilar palpi brownish. Tergites of metasoma very dark reddish brown, basal sternites yellowish, hypopygium reddish brown. Legs light, mainly fulvous, with distal extreme of hind femora, distal three quarter of hind tibiae and hind tarsi mainly basitarsi infuscated of brown; hind coxae very dark reddish brown, more light distally. Tegulae yellow with the outer third hyaline. Wings hyaline. Costa, stigma and metacarpus brown; stigma with two small, whitish spots, one basal and another distal; r, veins of areolet and 1CUa+1CUb brownish, other veins light pigmented.

LENGTH. Overall body length: 3 mm. Antenna: 4.1 mm. Fore wing: 3 mm.

MALE. Unknown.

HOST. Unknown.

MATERIAL. Holotype, ♀, Andorra (Santa Coloma), 1-15/VI/1993 (leg. J. Pujade), Malaise trap, deposited in the "Colección del Laboratorio de Entomología de la Universidad de Valencia" (C.L.E.U.V.), Spain.

NAME DERIVATION. The etymology of the specific name, *Rasivalva pyrenaica*, alludes to the locality of Santa Coloma which is located in the Andorran Pyrenees.

REMARKS**.** The new species *R. pyrenaica* is apparently related to *R. karadagi* Tobias, 1995, they can be distinguished from each other and from other species by the features in the following key.

Key to Palaearctic species of genus *Rasivalva* Mason

1 First tergum unusual, distinctly broadening antero-posteriorly (Fig. 2.A), somewhat wider behind than long medially. Body 3.8 mm. Switzerland *R. desueta* (Papp, 1989) - First tergum almost parallel-sided and rounded apically, somewhat longer than wide 2

2 Metacarpus 4 times as long as distance between its distal end and tip of radial cell (Fig. 2.B); phragma clearly visible (Fig. 2.C); first section of discoideus (d1or1CUa) much shorter than second (d2 or 1CUb); bristles on outer side of hind tibiae thin, uniformly and widely scattered 3 - Metacarpus (R1) much shorter 4

3 Scutellum finely and sparsely punctate; postscutellum polished wholly, not interrupted at middle by rugosity; propodeum without trace of longitudinal carina; second and third tergi and antennae black. Body 3.5 mm. Western Europe *R. calceata* (Haliday, 1834) - Scutellum densely punctate; postscutellum polished interrupted at middle by rugosity; propodeum with very slight but distinct longitudinal carina, second tergum lateral to middle area yellow, third tergum along sides somewhat light colored; flagellum, except apex, yellowish. Body 3.5-4 mm. Western Europe *R. marginata* (Nees,1834)

4 Metacarpus 2 times as long as distance between its distal end and tip of radial cell; propodeum without longitudinal carina; mesonotum weakly punctate, lustrous; spines on outer side of the hind tibia thickened, numerous and very compact in its middle part (Fig. 2.D); phragma hidden; postscutellum polished, not interrupted at middle by rugosity; first abscissa of the discoideus (d1 or 1CUa) much shorter than second (d2 or 1CUb); hind femur and tibia entirely reddish yellow. Body: 3-3.5 mm. England, Finland R. circumvecta (Lyle, 1918) - Metacarpus (R1) shorter; propodeum with longitudinal carina; mesonotum and scutellum densely and very coarsely punctate, dull; spines on outer side of the hind tibia thin, sparse and rather uniformly scattered 5

5 Metacarpus 0.5 times as long as distance between its distal end and tip of radial cell; phragma hidden; penultimate flagellomere 1.5 times as long as wide; second tergum slightly sculptured, with smooth fields at anterior angles, separated by transverse grooves and with faintly demarcated longitudinal narrow median area; first abscissa (d1 or 1CUa) of the discoideus slightly shorter than second (d2 or 1CUb); hind femur and tibia entirely brown. Body: 2.8 mm. Crimea *R. karadagi* (Tobias, 1986) - Metacarpus (R1) 1.6 times as long as distance between its distal end and tip of radial cell (Fig. 1.C); phragma visible; penultimate flagellomere 2.4 times as long as wide (Fig. 1.B); second tergum rugulose, with a longitudinal narrow smooth median area clearly defined by a pair of subparallel wide grooves converging apically (Fig. 1.A); second abscissa (d2 or 1Cub) of the discoideus twice (or nearly) as long as first (d1 or 1CUa) (Fig. 1.C); hind femur and tibia brown

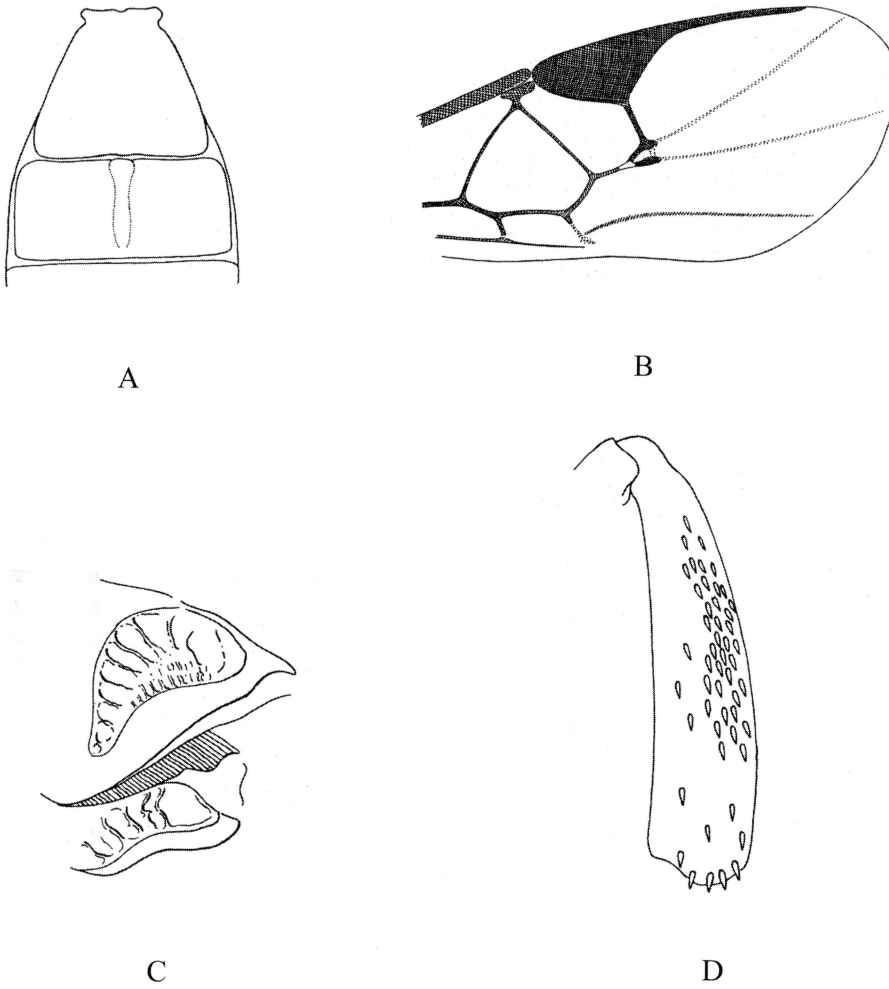

Fig. 2. A – *Rasivalva desueta*, basal tergites (from Papp 1989); B – *Rasivalva calceata*, fore wing, part (from Nixon 1965); C – *Rasivalva marginata*, scutellum, postscutellum and phragma (shaded) visible (from Nixon 1965); D – *Rasivalva circumvecta*, hind tibia (from Nixon 1965).

at apex and at distal three quarter respectively. Body: 3 mm. Andorra ***R. pyrenaica*** n. sp.

Discussion

Because the 1980s, the generic division of the subfamily Microgastrinae Foerster, 1862, commonly used is that by Mason (1981), which was a great improvement of microgastrine classification and was adopted by many subsequent workers, among

them Papp (1988, 1990) for European species and Whitfield (1997) for New World genera.

However, several weaknesses of Mason's (1981) classification gradually became more evident, especially as additional new taxa were discovered and attempts were made to incorporate these into his system. At present, Masońs phylogeny of Microgastrinae is being reassessed by a number of taxonomists world-wide, through data analyses, whether morphological or molecular (or both), summarized in Whitfield et al. (2002). However, until these revisions are presented, *Rasivalva* spp. have two apomorphic features: specialized minute hairs on the ovipositor sheath and toothless mandible in the larva in accordance with Mason's (1981) classification.

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