A REVISION OF THE GENUS *PSEUDEPROTAPION* EHRET, 1990 IN THE IBERIAN PENINSULA, WITH DESCRIPTION OF A NEW SPECIES

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Abstract: The Iberian species of *Pseudoprotapion* are revised. Three species were found. *P. alonsochrysomimus n. sp.* is a new species from East and Southeast Spain. *P. dumeei* (Hoffmann, 1957) *stat. prom.* is a good species, not a subspecies of *P. astra-gali* (Paykull, 1800). It was described from Morocco and is a new record for Iberia. *P. tricarinatum* (Waltl, 1835) *stat. rev.* is a good species previously under synonymy of *P. elegantulum* (Germar, 1818). The two species that had been recorded until now in the catalogues for Spain, *P. astra-gali astra-gali* and *P. elegantulum* were not found in this study and are doubtful records for the Iberian Peninsula. They could be present, but only in northern areas. Finally, the preimaginal states and the biological cycle of *P. alonsochrysomimus* are reported. The larva develops in buds of *Ononis tridentata* subsp. *anguistifolia* in xerothic sites. *Trichomalus* sp. is recorded as a pupal parasitoid of this insect.


Revisión del género *Pseudoprotapion* Ehret, 1990 en la Península Ibérica y descripción de una nueva especie.


Taxonomy: *Pseudoprotapion alonsochrysomimus* new species from East and South Spain.

Introduction

As part of a survey of Western Palearctic Piezotrichelini by one of the authors (MR) it has become apparent that the genus *Pseudoprotapion* is much in need of revision, containing a number of poorly understood taxa and unrecognised species. Within the western Palearctic context the unexplored complexities appear to fall into two geographical areas: the Iberian region in the west and a swathe of territory from Greece to Iran in the east.

Up until now the recognised *Pseudoprotapion* fauna of the Iberian Peninsula has consisted of three species. Two of them were recorded by Alonso-Zarazaga (2002, 2011), namely *P. astra-gali astra-gali* (Paykull, 1800) and *P. elegantulum* (Germar, 1818). The records from Spain of *P. elegantulum* are only cited by Iglesias (1920); Navás (1921, 1923, 1924); Roudier (1954); Santos, Mateos & Viñolas, 2009; Sanz & Gurrea 1991; Oliveira, 1890. The species has been recorded from the provinces of Ávila, Barcelona, Gerona, Granada and Tarragona, and the Portuguese districts of Faro and Guarda. Alonso-Zarazaga (pers. com.) reported 1 male from Sierra de Cazorla, collected by J. de Ferrer in the coll. Fernández Cortés. Another Iberian species of *Pseudoprotapion* remained undetermined, but had been collected persistently on *Ononis tridentata* L. subsp. *anguistifolia* (Lange) Devesa & G. López (Fabaceae, Onioneae) in gypsum soils (Velázquez de Castro, 1990; Megías et al., 2011, in this last publication this species was named *P. baeticum* without description, its status is here established as *nom. nudum*).

Note: Occasionally Iberian specimens of *Pseudoprotapion* have been tentatively identified as *P. ergenense* (Becker, 1864). Ongoing research by MIR suggest that this species is one of a complex ranging from Eastern Europe and western Russia and Ukraine (the nominate species) to the Caucasus and Armenia (undescribed), Turkey (potentially at least two species), and Macedonia/Thracian Greece (undescribed). Superficially the complex differs from Iberian and western European species in having elytra longer in relation to width, metarosstral length less or equal to eye length, with very little or no mesorostral thickening, and legs in most of the group noticeably shorter.

Material and methods

The main collection studied was in the Museo Nacional de Ciencias Naturales (MNCN) in Madrid, where MR was hosted by Dr. M. A. Alonso-Zarazaga. Other private collections were also consulted (see below). For the undescribed species,
additional specimens were collected in several sampling trips to different provinces of Spain where *Ononis tridentata* subsp. *angustifolia* is present, from 1990 to 2013. These collecting localities were mapped by using the DMAP for Windows software (Morton, 2015). In two localities larvae were obtained and reared to adults. The life cycle and phenology were studied in one of these sites, Alborache (fig. 1), Valencia province (UTM 30SX396, 310 m). Its climate is dry Mediterranean, CsA following the classification of Köppen and Geiger (AEMet & IM, 2011). The temperature averages 16.0 °C and the average annual rainfall is 423 mm. Adult specimens collected there were taken to the laboratory and reared in boxes with nylon mesh sides and plastic bases. Flower buds of *O. tridentata* were dissected and larvae and pupae found there were placed in Petri dishes to finish their life cycle. Parasitoids were separate from preimaginal states when found. Petri dishes were also used to observe feeding of adults and larvae. Dissections and mounting of specimens followed standard procedures.

Abbreviations used are: acl, antennal club length; acw, antennal club width; apw, apical pronotal width; arw, apical rostral width; b/w, basal elytral width; b/w, basal pronotal width; brl, basal rostral length (from front of eyes to antennal insertion); el, elytral length; ely, eye length; hl, head length; hw, head width; mew, maximum elytral width; minrw, minimum rostral width; mprw, maximum pronotal width; msrw, metarostral width; mtrw, minimum metarostral width; pl, pronotal length; ptbl, minimum profemoral thickness; ptl, protorsoal length; pbl, protibial length; pthw, maximum protibial width (excluding any vestiture on inner margin); ptsl, protarsal length; rl, rostral length; scl, antennal scape length.

Measurements: The range is given in millimetres, followed by the average value in parentheses.


**Results**

Of the material studied three species identified in the area were different from those previously recorded. No specimens of either *P. astragali* astragali or *P. elegantulum* were found.

A new species is herein described to which some of those Iberian specimens previously considered as *P. astragali* astragali belong. The second species, *P. tricarinatum* (Waltl, 1835) was long considered a synonym of *P. elegantulum* but herein is recognised as a good species. Furthermore *P. astragali dumeci* was found in the Iberian Peninsula and it is raised to species level. The records from Spain of *P. elegantulum* and *P. astragali* must be revised.

A small number of further specimens were studied which differed from the above sufficiently to be excluded, but in singletons or series too short to describe with confidence. Of these specimens those that caused the greatest difficulty are a series collected by E. Colonnelli in Granada Province, Baza area, without host plant indications, some of which compare closely with the new species described herein while others were too different to be included. After considerable agonising it was thought safest to exclude these specimens until further material becomes available. In addition a handful of specimens from Palencia, Teruel and Barcelona provinces were also put aside pending further material for study.

Both *P. astragali* and *P. elegantulum* occur in France close to the Pyrenees, and as they might still be found in adjacent regions of Spain, descriptions of both are included in this revision, and even if not, it helps to illuminate the differences that have led to any changes in taxonomic status.

**Genus Pseudoprotapion Ehret, 1990**

**Type species** *Attelabus astragali* Paykull, 1800


**Description:**

Length (rostrum excluded): 2.00-3.15 mm. Elytra metallic, body black or metallic, antennae black, legs obscurely metallic or black. Vestiture piliform, microscopic.

Rostrum with weak sexual dimorphism, long and curved (rl/pl ♂♂ 1.22-1.58, ♀♀ 1.39-1.76). Male mesorostral weakly dilated.

Eyes round, more or less convex, ventrally closer than dorsally. Frons flat with 3-5 more or less superficial carinae/striae. Gular tooth often present, well developed in some species.

Antennae at basal 0.25-0.35 of rostrum in both sexes. Scape clavate, short (length/ mesorostrum width 0.65-1.20). Club 1.6-2.7 longer than wide, oval, tapered apically, sutures visible.

Pronotum campanulate to subrectangular, slightly transverse, apicically more or less constricted. Basal flange very weak to absent. Prescutellar fovea sulciform, often very long. Pronotal base bowed to slightly bisinuate.

Scutellum triangular-oval, slightly convex, smooth to corrugated. Elytra elliptical to oblong-oval, convex. Striae join at apex 1+2+9 (more deeply impressed than on disc), 3+4, 5+6, 7+8, at base 1st not or hardly reaching scutellum, 3rd basally straight (*elegantulum* group) or excurved (*astragali* group). One seta on apex of 9th stria.

Mesocoxae separated by circa 0.2 x own diameter. Mesosternal apophysis slightly less prominent than metasternal apophysis, latter strongly flanged. Anterior metasternal rim strong. First two sternites moderately convex. Suture 1 visible. Male 1st sternite often with one or two tubercles.

Male tibiae unarmed, legs elongate, profemora 3-4 x as long as wide, protibial length / width 6.4-9.5. Tarsi moderately long, 1st protarsomere 1.6-2 x as long as wide, 2nd-0.9-1.2 x as long as wide. Claws toothed.

Male genitalia: Tegmen with parameroid lobes separated by circa 0.25 mm or less of length, median notch widely triangular, outer membranous area microsetose, inner sclerotised area with short macrochaetae. Fenestrae separated, transverse. Prostegium fused to (*elegantulum* group) or articulated with (*astragali* group) free ring, prostegium acutely protruding medially in all species studied and with high crista in the *astragali* group. Aedeagus in profile curved, apex recurved or not, temones short to minute, internal sac with two rows of teeth. Spiculum gastrale Y-shaped, with manubrium longer than arms.

**Diagnosis:** *Pseudoprotapion* is easily distinguished among Palaearctic Piezotrachelini by their colour. The genus comprises 13 Palaearctic species. There are two subgroups within the genus, one being metallic green or blue with darker legs,
rostrum and antennae, the other black with blue or blue-green elytra. The monospecific genus *Euprotapion* Wagner, 1927 (*E. kueenburgorum* (Reitter, 1898), from central Asia, Armenia and Turkey is the only other western Palaearctic Piezotricheline species with blue elytra. However, it can be readily distinguished by its largely testaceous femora, as well as a highly individual habitus, and a biological association with Apiaceae, unique among western Palaearctic Apionidae.

**Biology:** Species of the metallic green/blue group are associated with plants of the tribe Galegaeae (*Astragalus L.* and *Erophaca* Boiss.), at least where reliably recorded (Dieckmann, 1977, Poiras, 1998), so it is of particular interest to discover the association of *P. aschrochrysmus* with *Ononis tridentata* L. (Trifoliiaceae). They develop in larval state in pods or flowers buds and pupate inside them. These species may be inhabitants of xerothermic sites, as described by Gosik (2006) for *P. ergenense*, and observed also in *P. dameei* and *P. alonsochrysmus*. Species making up the blue and black group have been recorded from *Onobrychis vicifolia* Scop. (Hedysareae) (Dieckmann, 1977). The organ of the plant in which the larvae develops is unknown.

*Pseudoprotapion alonsochrysmus* Russell & Velázquez de Castro sp. nov.

Fig. 2a.

**Description**

**Size and Colour:** Length, male: 2.25-2.54 mm, (average 2.35 mm, 23 specimens), female 2.45-2.70 mm, (average 2.55, 11 specimens). Colour metallic green or golden-green, frons and pronotum sometimes with bluish gleam; rostrum coppery to brassy black on prorostrum, appearing black in indirect lighting; metarostrum more or less parallel-sided, laterally stronger, set into juncture with metarostrum; punctures on metarostrum distinct, angled (the latter more commonly), from there whole rostrum apically; whole rostral surface smooth and shiny, sometimes with any basal metarostral microsculpture further reduced.

**Antennae:** Male: scape length 0.17-0.20 (0.19); club length 0.09-0.10 (0.10). Female: scape length 0.17-0.19 (0.18); club length 0.09-0.11 (0.10). Both sexes: Colour brown to blackish-brown; scape elongate, weakly enlarged apically, paler brown basally; 1st funicular article elongate oval, as thick or slightly thicker than apex of scape, more than half length of scape, 2nd to 5th articles longer than wide, progressively shorter, 5th article sometimes barely longer than wide (dimensions of individual articles quite variable across different specimens), 3rd to 5th articles more or less cylindrical, only slightly narrower at articulation points, 6th article equal in length to 5th, very slightly wider and widest subapically, 7th still wider, isodiametric and widest apically; club remarkably broad in proportion to length, 1/2 club length 2.00-2.11 (1.85), only the known Western Palaearctic species with mean < 2.00; club remarkably setose, each segment appearing hisurate in certain lighting, in addition to the numerous distally directed setae there are an unusual number of very pale and fine setae approximately twice as long and standing out at between 45-60°; funicular setae longer and thicker than other W. Palearctic species, increasing distally both in length and angle of projection, length greater than originating article on last 3-4 articles, angle of incidence on 7th article approximately 45°; club length equal to last four funicular articles.

**Head:** Male: length 0.35-0.38 (0.36); width 0.35-0.39 (0.37); eye length 0.20-0.23 (0.22). Female: length 0.33-0.38 (0.36); width 0.35-0.38 (0.37); eye length 0.21-0.23 (0.22). As broad as long in both sexes (difficult to ascertain precise measurements as most specimens examined are point-matched, with the head greatly extended: 1/2 width 1.95-1.03 (0.98), 1/2 1.92-1.06 (0.99), marginally wider at base than across eyes, narrowest at posterior margin of temples; eyes large, convex, anterior angle approximately 55°-70° from longitudinal axis; frons as wide as metarostrum, strongly quadristriate, mostly impunctate though some individuals with a few scattered punctures, usually laterally, rarely more centrally, surface very shiny even when shallow and confused microsculpture is present (variable character); vertex narrow, particularly laterally where punctures may be jostled together, posteriorly sharply delineated, weakly raised in ℘℘, merely weakly creased in ℘; temples strongly punctate around eyes, usually in single row but occasionally irregularly doubled; ventrally surface between eyes roughly coriaceous, ending in abrupt transverse line a little posterior of eyes, at which point exhibiting minute denticle in lateral view; transverse striations on neck very fine; setae not visible.

**Pronotum:** Male: length 0.50-0.56 (0.52); width at apex 0.44-0.48 (0.46); width at base (maximum width) 0.59-0.65 (0.61). Female: length 0.52-0.59 (0.56); width at apex 0.46-0.51 (0.49); width at base (maximum width) 0.61-0.67 (0.64). Similar in both sexes, slightly broader than long, l/w
Figure 1a-b. Sampling site for P. alonsochrysomimus in Valencia. Figure 2a. Habitus of adults of Pseudoprotapion alonsochrysomimus.
Figure 2b-e. Habitus of adults of *Pseudoprotapion*. 2b) *P. dumeei*; 2c) *P. tricanatum*; 2d) *P. astragali*; 2e) *P. elegantulum*. 
**Sculptum**: small, elongate-oval, black, smooth to vaguely creased longitudinally; sometimes with slight and irregular microsculpture, difficult to estimate without appropriate angle of lighting.

**Elytra**: male: length 1.48-1.64 (1.56); width at base 0.84-0.93 (0.87); maximum width 1.01-1.12 (1.06). Female: length 1.60-1.78 (1.69); width at base 0.88-0.96 (0.91); maximum width 1.09-1.17 (1.14). Similar in both sexes; oval: humeri distinct though very oblique by comparison with other species of the genus (45° to longitudinal axis), more or less rounded (basal w/ maximum w ♂♂ 1.39-1.47, m 1.40; ♀♀ 1.38-1.47, 1.43), outline a continuous smooth curve from humeral region to apical region, broadly widest at or slightly posteriorid of midpoint (some individuals of both sexes exhibit a very slight swerve in outline post-humerally), apical broad and blunt, in direct dorsal view exhibiting only very slight angle with lateral outline; in lateral view moderately convex, with straight apical declivity, steeper in males; striae narrow, maximum width equal to half interstriae, sharply defined to apex, suture stria not reaching scutellum, 3r and sometimes 4th encroached basally; strial punctures small, numerous, separated by at most twice their diameter and not encroaching on interstrial margins; interstriae flat to very weakly convex, finely but distinctively cross-hatched into vague longitudinal; sometimes with slight and irregular microsculpture, difficult to estimate without appropriate angle of lighting.

**Genitalia**: Aedeagus (fig. 3e, 4e). Median lobe ended in developed, also the endocarina. Pupa pale yellow, covered with all cranial sutures clearly developed, also the endocarina. Pupa pale yellow, covered with all cranial sutures clearly developed, also the endocarina.

**Egg** white, oval, length 0.39 mm, width 0.29 (figure 7a). Neonate larva elongate, yellow, length 0.31 mm, width 0.22, cranium length 0.15 mm, width 0.14. Mature larva pale yellow (fig 7 b, c). Form, 2.6 mm length aprox., 0.8 mm high, with all cranial sutures clearly developed, also the endocarina. Pupa pale yellow, covered with very long setae (fig. 7 d, e). Pupal chaetotaxia: head with a pair of rostral setae and a pair of supraorbital setae, pronotum with a pair of apical setae, two pairs of dorsal, two pairs of lateral and one pair of posteralateral setae, metanotum with a pair of dorsal setae, femur with one apical setae, abdomen without setae. Pseudocerci long and parallel.

**INDICES**: Male: Rostrum: brl/r 0.31-0.35 (0.33); rl/pl 1.43-1.58 (1.51); rl/msrw 4.28-4.88 (4.65); msrw/mtrw 1.07-1.31 (1.16); msrw/arw 1.33-1.50 (1.41); msrw/minrw 1.45-1.64 (1.52); msrw/eyl 0.70-0.82 (0.77); brl/r 0.31-0.35 (m. 0.33); brl/eyl 1.04-1.35 (1.19). Antenna: scl/msrw 0.78-0.94 (0.85); acl/acw 1.80-2.00 (1.94). Head: eyl/hl 0.56-0.66 (0.60); hl/hw 0.95-1.03 (0.98).

**Proneural**: mpw/hw 1.59-1.77 (1.66) bwp/apw 1.30-1.38 (1.33); pl/mpw 0.82-0.86 (0.84).

**Elytra**: mew/msrw 1.16-1.80 (1.73); el/pl 2.93-3.18 (3.02); el/mew 1.45-1.50 (1.47); mew/bew 1.16-1.26 (1.21); bew/msrw 1.39-1.47 (1.42); el/plbt 1.87-1.99 (1.93). Legs: pft/msrw 1.11-1.25 (1.20); pft/pl 1.51-1.68 (1.57); pftl/pbtwm 6.42-7.70 (6.91); pftl/pftbl 0.54-0.63 (0.59); pftl/r 1.00-1.09 (1.04).

**Male**: Rostrum: brl/r 1.02-0.33 (0.31); rl/pl 1.57-1.73 (1.68); rl/msrw 5.24-6.13 (5.72); msrw/mtrw 1.07-1.23 (1.05); msrw/arw 1.25-1.45 (1.36); msrw/minrw 1.45-1.70 (1.55); msrw/eyl 0.68-0.81 (m. 0.76); brl/r 0.29-0.33 (m. 0.31); brl/eyl 1.23-1.45 (1.33). Antenna: acl/msrw 0.88-1.07 (0.96); acl/acw 1.64-2.11 (1.85). Head: eyl/hl 0.55-0.64 (0.60); hl/hw 0.92-1.06 (0.99).

**Female**: Rostrum: brl/r 1.09-1.35 (1.23); rl/pl 1.57-1.73 (1.68); rl/msrw 5.24-6.13 (5.72); msrw/mtrw 1.07-1.23 (1.05); msrw/arw 1.25-1.45 (1.36); msrw/minrw 1.45-1.70 (1.55); msrw/eyl 0.68-0.81 (0.76); brl/r 0.29-0.33 (m. 0.31); brl/eyl 1.23-1.45 (1.33). Antenna: acl/msrw 0.88-1.07 (0.96); acl/acw 1.64-2.11 (1.85). Head: eyl/hl 0.55-0.64 (0.60); hl/hw 0.92-1.06 (0.99).

**Proneural**: mpw/hw 1.65-1.83 (1.73); bwp/apw 1.27-1.36 (1.32); pl/mpw 0.84-0.90 (0.87).

**Elytra**: mew/msrw 1.73-1.84 (1.78); el/pl 2.86-3.15 (3.03); el/mew 1.43-1.52 (1.48); mew/bew 1.21-1.29 (1.25); bew/msrw 1.38-1.47 (1.43); el/plbt 1.98-2.12 (2.04). Legs: pftl/msrw 1.19-1.40 (1.23); pl/pbtl 1.42-1.55 (1.48); pftl/pbtwm 6.75-7.64 (7.16); pftl/pftbl 0.54-0.58 (0.56); pftl/r 0.85-0.94 (0.88).

**PREIMAGINAL STATES** (fig. 7): Egg white, oval, length 0.39 mm, width 0.29 (figure 7a). Neonate larva elongate, yellow, length 0.31 mm, width 0.22, cranium length 0.15 mm, width 0.14. Mature larva pale yellow (fig 7 b, c). Form, 2.6 mm length aprox., 0.8 mm high, with all cranial sutures clearly developed, also the endocarina. Pupa pale yellow, covered with very long setae (fig. 7 d, e). Pupal chaetotaxia: head with a pair of rostral setae and a pair of supraorbital setae, pronotum with a pair of apical setae, two pairs of dorsal, two pairs of lateral and one pair of posteralateral setae, metanotum with a pair of dorsal setae, femur with one apical setae, abdomen without setae. Pseudocerci long and parallel.
**ADULT DIAGNOSIS:** Most readily distinguished from other metallic Iberian species by strongly setose antennae and compact antennal club.

**ETYMOLOGY:** from Greek "chryso", gold, and "mimos", an imitator. This noun in apposition means that the bright colour of this species imitates the brilliant career of our dear colleague Dr. M. A. Alonso-Zarazaga, to whom it is kindly dedicated.

**DISTRIBUTION:** East and Southeast of the Iberian Peninsula. From Northeast Granada (Baza) to South Zaragoza (South from Calatayud). Mostly in zones with Triassic gypsum soils (figure 8).
BIOLGY:

Life cycle: Adults are present on the plant almost all year, being rare in winter and in the beginning of autumn (personal observations and data from Sánchez-Piñero, 1994). They are more abundant in spring, when the plant starts to bloom. Mating was observed during May, and gravid females appeared from the beginning of this month. Egg-laying was observed in the middle of May, but it surely begins in April. Mating was observed during May, and gravid females appeared from the second half of April to the end of May. Popes were found in the same period. Only one larva or pupa per flower was ever observed. In the laboratory, the larvae of P. alonsochrysomimus moulted to pupa, and then from pupa to adult, inside the calyx of the flower. The presence of eggs and larvae were simultaneous with the first flowering of the plant. It starts blossoming at the end of April, and develops fruits by the end of May. The plant continues flowering in summer and autumn, coexisting both fruit and flowers till the end of the year. However, larvae were not observed in summer. The plant has no flowers in winter.

Host plant: The insect seems to be monophagous on Ononis tridentata subsp. angustifolia. The distribution in Spain of O. tridentata is shown in fig. 8 (personal compilation, an alternative and detailed compilation is figured in Mota, Sánchez-Gómez & Guirado, 2011). This plant is highly polymorphic and has three subspecies (Devesa & López, 1997, but see preliminary data from Martínez-Nieto, 2012). The nainotypical subspecies occurs in Central, N Central and Eastern of the Iberian Peninsula, also in one small spot in Morocco. It lives on Cainozoic, Tertiary gypsum marls. Instead, O. tridentata subsp. angustifolia is distributed only in eastern of Iberian Peninsula, on Mesozoic, Triassic gypsum or gypsum marls. Finally, O. tridentata subsp. crassifolia (Léon Dufour ex Boiss.) Nyman occurs only in one spot in Granada, on gypsum soils. We have no data on this last subspecies, but O. tridentata subsp. tridentata was intensively sampled during more than a year of research in Zaragoza (Nos Monegros, North East Spain), and no Pseudoprotapion was found (Velázquez de Castro et al., 2000). Moreover, O. tridentata subsp. tridentata is present in an area of Central Spain, including SE of Madrid province, and this zone is also frequently sampled by entomologists, but without any record of this weevil.

Feeding habits: Adults fed on leaves and flowers (fig. 9b). In leaves, their bites were made either in the basal, medial or apical part, the bites form a hole, in some cases from side to side of the leaf (fig. 9c). In flowers, adults ate petals, and were frequently observed making a hole inside a bud to chew the anthers and apparently eat the pollen. The adult specimens that were placed in Petri dishes with only fruits inside did not feed on them; instead they died soon, in 4-5 days.

Larvae feed inside the flowers (fig. 9a). All the androecium and the gynoecium were eaten. Most part of the petals is left intact as they will finally enclose the pupa. Only the internal part of keel and the dorsal part of wings were eaten, while the banner was almost uneaten.

Other habits: Thanatosis was frequently observed when manipulating adults. Only in one occasion an insect was observed using the flight as a defence mechanism.

Parasites: Parasitoids were observed in both larvae and pupae. Two of the larval specimens died as a consequence of parasitoidism. A single parasitoid emerged from each; one of them was studied and mounted to pupa but then died. Its shape and biology make it a possible member of Hymenoptera Eucoilidae (fig. 11). One pupa of P. alonsochrysomimus was also parasitized by a larva of Hymenoptera; this larva moulted to pupa and then to adult in the laboratory, and these three stages were photographed (fig. 10). This parasite belongs to the family Pteromalidae, genus Trichomalus Thompson, 1878. The genus Trichomalus includes species that parasitize Apionidae, other weevils and other insects (Graham, 1969).

TYPE MATERIAL: 8 ♀♀ 11 ♂♂, all from Valencia province and collected on O. tridentata subsp. angustifolia.

Holotypus: One ♀ with the following labels: 1 = VALENcia/30-6-1990/Velazquez; 2 = ♂; 3 = Chelva; 4 = Ononis tridentata, Coll Museo Nacional de Ciencias Naturales de Madrid.

Paratypus: 3 ♂♂ mounted on card (MNCN); 3 ♂♂ mounted on points (CMR); 3 ♂♂ mounted on cards (MNCN); 4 ♀♀ mounted on points (one with detached head glued to same point card ventral side up, CMR); 2 ♀♀ mounted on cards (CVC). All the 15 specimens mentioned before with same labels as holotypus. 1 ♂ mounted on card with labels 1, 3, 4 all in the handwriting of the first author (this is the illustrated specimen, CMR). 1 ♂ and 1 ♀ mounted on points with the following labels: 1 = Cofrentes /8-7-1990; 2 = Valencia/Hispania (CVC).

(Locality data: Chelva 30SXK70, 430 m, Cofrentes 30SXJ63, 776 m)


Figure 6. Spiculum gastrale. a. dumeii b. alonsochrysomimus. Bar = 0.1 mm. Figure 7. Preimaginal stages of P. alonsochrysomimus. a. egg, b) mature larva, c) mature larva, anterior part, d) pupa, ventral view, e) pupa, lateral view. Figure 8: Distribution of Pseudoprotapion alonsochrysomimus (squares) and Ononis tridentata (yellow) in the Iberian Peninsula (plant distribution approximate). Figure 9. Feeding activity of P. alonsochrysomimus. a. larva inside a bud; b. adult feeding on a bud; c. feeding hole of adult in a leaf. Figure 10. Trichomalus sp., parasitoid of pupa of P. alonsochrysomimus. a. larva; b. pupa; c. adult. Figure 11. Pupa of a Hymenopteran parasitoid of a larva of P. alonsochrysomimus.
**Pseudoprotapion dumeei** (Hoffmann, 1957) stat. prom.

Fig. 2b. *Apion astragali dumeei* Hoffmann, 1957.

**DESCRIPTION**

**Size and colour:** male length: 2.44-3.00 mm (2.76), 32 specimens; female length: 2.70-3.15 mm (2.89), 23 specimens. Colour dark green including legs and rostrum, though both these last may appear somewhat darker. Tarsi blackish.

**Rostrum:** Male: length 0.70-0.84 (0.80); width at mesorostrum 0.15-0.19 (0.17); at apex 0.11-0.13 (0.12); minimum width 0.11-0.13 (0.12); minimum metarostral width 0.13-0.18 (0.16). Dark blush to bright green, easily appearing black in indirect lighting; in lateral view moderately and evenly curved from mesorostrum to apex, base of rostrum dorsally approximately in straight line with frons; mesorostrum gently to hardly dilated, the proximal lateral outline narrowing gradually to narrowest part of metarostrum close to base of rostrum; proorostrum gradually and weakly narrowing for proximal half to two thirds, apical third cylindrical to very feebly expanded at apex; ventral dilation of mesorostrum slight however proximal angle of incidence with metarostrum (in lateral view) usually distinct; punctation present throughout, small (approximately ommatidium-sized), elongate, numerous, discrete, tending to wavy longitudinal alignment, largest and tending to feebly longitudinal confluence on metarostrum (even punctate grooves on lateral sides are usually more weakly developed than is usual in the genus), smallest apically on proorostrum but present up to apex; microsculpture fine and scratchy on metarostrum, particularly basally, weaker to absent on proorostrum, whole surface gleaming rather than shining.

Female: length 0.88-1.10 (1.00); width at mesorostrum 0.15-0.19 (0.16); at apex 0.12-0.14 (0.13); minimum width 0.11-0.14 (0.12); minimum at metarostral 0.13-0.17 (0.15). Distinctly longer, in lateral view less curved and degree of curvature more evenly spread along whole length, ventral dilation of mesorostrum very slight to virtually absent; in dorsal view metarostrum more parallel-sided, mesorostrum weakly to hardly at all dilated, proorostrum tapering gently to narrowest around 2/3rd of length, apical third cylindrical to weakly expanded; punctation and microsculpture similar to male, if anything a bit lighter.

**Antennae:** male: club length 0.21-0.25 (0.23); width 0.09-0.10 (0.09); scope length 0.15-0.18 (0.17). Female: club length 0.21-0.24 (0.23). Scopa length 0.09-0.10 (0.09); scope length 0.17-0.21 (0.18). Similar in both sexes, slender, all funicular articles elongate, decreasingly so distally, seventh sometimes virtually isodiametric; colour very dark brown to black with articles elongate, decreasingly so distally, seventh sometimes weakly expanded; punctation and microsculpture similar to Fig. 2b.

**Elytra:** Male: length 0.93-1.08 (1.00); maximum width 1.12-1.30 (1.23). Female: length 1.81-2.12 (1.92); width at base 0.95-1.13 (1.03); maximum width 1.20-1.43 (1.29). Elytra-oval, broadest in middle, shoulders sloping (45-60° from horizontal) but distinct, angled in outline around more or less prominent, elongate humeral callus, from thence outline continued in gentle curve through widest midpoint to subapex, distal half more rounded in females, often rather compressed in males in which case giving the widest point a rather angular impression; apical declivity steep in males with apical margin ‘bow’ only briefly visible dorsally, in females declivity is shallower and marginal bow consequently more prominent; striae narrow, sharply incised, distinct to apex; strial punctures small, numerous (separated by 1-1.5 their diameter), entirely contained within strial margins; interstriae broad (at least twice strial width), sub-flat to weakly raised, extensively marked with fine transverse scratches, grooves and pleats which seldom traverse the whole interstrial width and give the surface a silky sheen in contrast to the more metallic pronotum and head; interstrial punctures minute numerous, irregularly uniserial to triseriate; setae small and fine, not overlapping, numerous, visible overall at higher magnification.
Legs: male foreleg: tibial length 0.82-0.99 (0.92); maximum tibial width 0.10-0.12 (0.11); femoral thickness 0.19-0.23 (0.21); tarsal length 0.49-0.59 (0.54). Female foreleg: tibial length 0.84-1.05 (0.94); others as male. Longest and proportionally thinnest legs of all western Palaearctic Pseudoprotropia species; metallic greenish black, femora often more distinctly green, tarsi brownish-black; femora long, weakly inflated medially (slightly more on profemora, least on metafemora), elongate apically, appearing thin due to length as actual thickest width similar to P. astragali and P. alonsochrysuminus, punctate and microreticulate, particularly distally, setae small, pale and sparse, only really noticeable pre-apically in certain lighting, general appearance glabrous; protibia long and thin, straight to weakly outwardly curved, apex very weakly expanded, internal margin barely excavate subapically, surface punctate and longitudinally rather grooved and ridged, giving a rough appearance though still shiny, setae very small and sparse, apico-internal comb of setae fine and short, pale brown, insignificant; meso- and metatibiae very similar to above, mesotibiae approximately 10% shorter, both meso- and metatibiae weakly expanded apically with very little swerve in internal margin outline preapically, apical comb setae short and fine, though thicker than on protibia, also darker, remaining setae as for protibia; all tarsi long and thin; 1st protarsomere in both sexes at least x 2.5 longer than wide with straight sides widening from base and ending apically in sharp right-angled ‘cut-off’, thus widest at apex, similar on meso- and metatarsi but a little shorter; 2nd tarsomere elongate triangular (length/width x 1.5 on protarsi, x 1.25 on others), sides straight from narrow-shouldered base to distinct apical angles; lobes of 3rd tarsomere elongate-oval; onychium extended by half its length or a little more; tarsal claws small, sharply hooked and strongly toothed; tarsal setae very fine, hairlike (including even the normally more robust apical overreaching setae), not obscuring the shiny smooth surface, surface with small isolated punctures.

Genitalia: Aedeagus. Median lobe (fig. 3d, 4d) very thin, ball pointed, tegmen (fig. 5d) with prostecticum articulated to free ring. Spiculum gastrale as in fig. 6a.

Indices: Male: rostrum: rl/pl 1.30-1.50 (1.39); rl/msrw 4.21-4.94 (4.59); brlrl 0.31-0.35 (0.33); msrw/mtrw 1.06-1.29 (1.11); msrw/arw (=msrw/minrw) 1.31-1.50 (1.41); msrw/eyl 0.63-0.72 (0.68); brl/eyl 0.96-1.13 (1.04). Antenna: scl/msrw 0.83-1.06 (0.98); acl/acw 2.10-2.67 (2.43). Head: hl/hw 0.90-1.08 (0.99); eyl/hl 0.58-0.69 (0.64); pronotum: mwp/hw 1.61-1.87 (1.71); bpw/apw 1.30-1.43 (1.35); pl/mpw 0.79-0.88 (0.84). Elytra: mew/mpw 1.71-1.88 (1.79); el/pl 3.00-3.61 (3.21); el/mew 1.44-1.63 (1.50); mew/bew 1.18-1.29 (1.23); bew/mpw 1.40-1.55 (1.46). Foreleg: pft/msrw 1.12-1.35 (1.23); ptbl/ptbmw 1.51-1.68 (1.661); ptbl/ptbmw 7.58-9.50 (8.36); ptsl/ptbl 0.54-0.62 (0.58); ptbl/rl 1.11-1.22 (1.16); el/ptbl 1.87-2.17 (2.00).

FEMALE: rostrum: rl/pl 1.49-1.74 (1.63); rl/msrw 5.44-6.75 (6.07); brlrl 0.27-0.32 (0.30); msrw/mtrw 1.06-1.15 (1.08); msrw/arw 1.23-1.42 (1.31); msrw/minrw 1.23-1.55 (1.41); msrw/eyl 0.56-0.75 (0.65); brl/eyl 1.00-1.38 (1.16). Antenna: acl/acw 2.30-2.67 (2.46); scl/msrw 0.94-1.20 (1.09). Head: hl/hw 0.95-1.05 (1.01); eyl/hl 0.57-0.68 (0.63); pronotum: mwp/hw 1.63-1.83 (1.74); bpw/apw 1.28-1.40 (1.34); pl/mpw 0.82-0.94 (0.87). Elytra: mew/mpw 1.71-1.93 (1.84); el/pl 3.00-3.35 (3.16); el/mew 1.39-1.56 (1.49); mew/bew 1.19-1.31 (1.25); bew/mpw 1.41-1.54 (1.47). Foreleg: pft/mswr 1.06-1.44 (1.28); plbl/pl 1.41-1.63 (1.53); ptbl/ptbmw 7.42-9.09 (8.39); ptsl/ptbl 0.52-0.62 (0.56); brl/rl 0.27-0.32 (0.30); ptbl/rl 0.91-1.01 (0.94); el/ptbl 1.92-2.17 (2.06).

DIAGNOSIS: Most readily distinguished by long thin legs, pronounced anterior collar of pronotum and larger size.

Distribution: Originally described from Morocco, recorded since from southern Portugal (collected abundantly in recent years at several locations in the Algarve by P.J. Hodge and M.G. Morris although three trips to the Baixo Alentejo by MR failed to find this species) and the Castilian region of Spain, although all records for this latter region date from 1920-30s. Sampling of its host plant by AJV in Valencia (L’Olleria) in leaves and seeds of the host plant was unsuccessful.

Biology: Recorded exclusively from Erophaca baetica (L.) Boiss. subsp. baetica (=Astragalus lusitanicus Lam. subsp. lusitanicus). The larvae develop in seeds (Hoffmann, 1957). Four specimens were obtained by this author from buds in 10.IV.1921. According to the material studied, adults are collected from April to November. Peyerimhoff (1926) reported the presence of a race of P. astragali of big size living in pods of A. lusitanicus, probably P. dumeei.

Specimens Examined: SPAIN: 1♀, Escorial (Madrid), 30. vii.1925 (MNCN); 1m 1f, San Rafael (Segovia), 15 vi.1929 (MNCN); 2♂♂ 1♀, Valsain (Segovia), 15.ix.1931 (MNCN).


Pseudoprotropia tricarinatum (Waltl, 1835) stat. res. Fig. 2c.

Apion tricarinatum Walt, 1835.

Description: Size and Colour: Male: 2.15-2.35 mm (2.26, 5 specimens). Female: 2.25-2.40 mm (2.34, 3 specimens). Colour black, elytra dark blue to greeny blue, tarsi may be very dark brown, lightest on apical joints, antennae black, including base of scape, antennal club may be very dark brown.

Rostrum: male: length 0.65-0.70 (0.67), basal rostral length 0.20-0.23 (0.22); minimum width 0.10-0.12 (0.11) (= width at apex); at mesorostrum 0.15-0.18 (0.16); at metarostrostrum 0.13-0.16 (0.14). Moderately short and robust, evenly curved and weakly angled with frons in profile, with virtually no ventral swelling of mesorostrum, forming very obtuse but distinct angle at juncture with gular region; metarostrostrum short, parallel-sided medially, basal buttresses flared, prominent in three of the four specimens examined; mesorostrum more or less strongly thickened, with proximal origin of thickening quite precise (more obviously so in specimens with greater thickening), distal narrowing of mesorostrum more gradual; prochoron more or less cylindrical, in some specimens very feebly enlarged apically; punctuation on metarostrostrum few, shallow, aligned dorsally, often indistinct against or more less strong background microreticulation which extends from the base onto the proximal part of the prochoron, punctuation on prochoron by contrast appears stronger against smooth background, the punctures continuing to apex in declining size and number.
Female: length 0.71-0.85 (0.79); basal rostral length 0.19-0.21 (0.20); minimum width 0.10-0.11 (0.11); width at mesorostrum 0.140-0.15 (0.15); at metorostrum 0.13-0.14 (0.14); at apex 0.11-0.12 (0.11). Distinctly longer and more slender in appearance, the effect enhanced by the proportionally more elongate prorostrum and less dilated mesorostrum; in profile similarly curved with a barely perceptible angle between frons and metatostrum and virtually no ventral swelling of mesorostrum; in dorsal view mesorostrum markedly less dilated; prorostrum cylindrical to very feebly enlarged apically, in which case narrowest part in proximal third; punctures comparatively reduced in size and quantity, particularly on prorostrum which is also shiny and smooth along entire length.

**Antenna**: male: club length 0.19-0.21 (0.20); width 0.09-0.10 (0.09); scape length 0.12.

Fairly short and moderately robust; scape short, apically rather roundly clubbed; 1st funicular article short-oval (at most x1.5 longer than wide), equal to or a little wider than apical swelling of scape; articles 2-4 progressively less longer than wide, 5th more or less isodiometric, all quite thickly jointed (2nd narrower at base) like close-set beads, 6th slightly broader and longer than 5th, 7th a little more so; antennal club approximately twice as long as wide, apical segment tapered to an acute point, length equal to at least last four funicular articles; funicular setae short (all less than length of originating article), curved to follow axis of antenna, a little more radiant distally, setae of club fine and sparse; colour black, including cle), curved to follow axis of antenna, a little more radiant distally, setae of club fine and sparse; colour black, including

**Scutellum**: small, bluntly triangular, variably smooth to quite coriaceous.

**Elytra**: male: length 1.41-1.59 (1.51); width at base 0.75-0.94 (0.83); maximum width 0.98-1.15 (1.08). Oval, widest at or slightly posterior of midpoint, humeri oblique (circa 60° to vertical axis), variably rounded with reduced humeral callus to weakly angled when callus is more pronounced, very little or no swerve in elytral outline subumbonally, apical half broadly rounded with steep apical declivity leaving relatively little of the apical ‘prow’ visible from above, this apical margin briefly semicircular with distinct angle formed at point of disappearance under lateral elytral bulge, in lateral view convex, less curved in anterior third, more or less steep posteriorly; striae sharply defined, distinct to apex, width not more than half interstrial width on disc, sutural stria not or barely reaching apex of scutellum (those that do almost reach do so as an abruptly much finer groove, sometimes even only on one elytron), 3rd and sometimes 2nd stria basally very weakly excurred; striae punctures small, numerous, separated by approximately twice their diameter and set entirely within stria so as not to affect margins; interstrial flat to weakly convex, very finely transversely scratched and even weakly pleated, giving the surface a finely rouged, satiny appearance; interstrial punctures exceedingly fine, confusedly uni-, bi- or occasionally triseriate, associated setae very fine indeed, at first glance appearing glabrous.

Female: length 1.47-1.59 (1.53); width at base 0.80-0.89 (0.84); maximum width 0.98-1.12 (1.06).

**Legs**: male foreleg: femoral thickness 0.17-0.18 (0.17); tibial length 0.69-0.76 (0.72); maximum tibial width 0.08-0.11 (0.10); tarsal length 0.41-0.49 (0.44). Female foreleg: femoral thickness 0.17-0.18 (0.18); tibial length 0.70-0.77 (0.73); maximum tibial width 0.09-0.11 (0.10); tarsal length 0.41-0.43 (0.42). Moderately slender; profemora longer and more muscular, apical narrow portion on all femora elongate (particularly in their dorsal aspect), smooth and shiny but variably punctate and microreticulate on apical narrower portion; all tibiae straight on internal margin, not much expanded apically; protibiae particularly slender apically, only very feebly enlarged on apical internal portion, not at all on external side, obliquely truncated (longest internally), apical comb of setae few, fine and short, indistinct, apico-internal
setae also fine and short, surface punctuation fine and scattered, often indistinct against extremely fine background reticulation, setae minute, pale, indistinct; metatibiae widening gradually from basal region without any abrupt increase apically, apical setal comb more developed; protarsi longer (1.14), 1st tarsomere at least twice as long, conically enlarged to truncate apex, 2nd and 3rd longer due to broadness of basal articulatory 'shoulders', sides straight, apex weakly concave, lobes of 3rd more angular, elongate oval, ocelliferous extended beyond lobes by approximately one third its length, claws small, acutely hooked and with long triangular tooth, setae fine and sparse, not obscuring surface which is smooth and shiny with isolated small punctures; meso- and metatarsi shorter, 1st tarsomere less than twice as long as wide, conically enlarged but with rather more curved sides, appearing more thickened or swollen apically, 2nd more briefly triangular, actually a little wider apically than long, also more strongly shouldered basally, the rest as for protarsi.

**Genitalia**: Aedeagus. Median lobe (fig. 3b, 4b) in lateral view wider at apex than at other species described here. Tegmen (fig. 5b) with prostegium fused to ring.

**INDICES**: Male: head: hl/hw 0.97-1.03 (1.01); eyl/hl 0.58-0.68 (0.62); rostrum: rl/pl 1.35-1.43 (1.39); rl/msrw 3.89-4.33 (4.12); brl/rl 0.31-0.34 (0.33); mswr/tnetrw 1.13-1.15 (1.14); mswr/arw 1.36-1.50 (1.44); mswr/minrw 1.45-1.55 (1.49); mswr/eyl 0.72-0.84 (0.79); brl/eyl 0.92-1.16 (1.07); antenna: scl/msrw 0.67-0.80 (0.73); ac/act 2.10-2.11 (2.11); pronotum: pl/mpw 0.85-0.91 (0.88); mwp/npw 1.62-1.72 (1.67); bpw/apw 1.20-1.33 (1.26); elytra: mew/mpw 1.88-2.07 (1.95); el/pl 2.96-3.32 (3.11); el/mew 1.37-1.44 (1.40); mew/bew 1.22-1.38 (1.31); bew/mpw 1.43-1.55 (1.49); foreleg: pft/msrw 1.00-1.13 (1.06); ptbl/ptbl 1.43-1.53 (1.49); ptbl/ptbmw 6.82-9.00 (7.63); ptbl/ptbl 0.58-0.64 (0.60); ptbl/rl 1.04-1.10 (1.07); el/ptbl 2.04-2.17 (2.09).

Female: head: hl/hw 1.00-1.09 (1.04); eyl/hl 0.57-0.62 (0.59); rostrum: rl/pl 1.52-1.69 (1.60); rl/msrw 5.07-5.67 (5.40); brl/rl 0.25-0.27 (0.26); mswr/tnetrw 1.07-1.08 (1.07); mswr/arw 1.25-1.36 (1.30); mswr/minrw 1.27-1.50 (1.38); mswr/eyl 0.67-0.71 (0.70); brl/eyl 0.90-1.00 (0.97); antenna: acl/act 2.10-2.25 (2.19); scl/msrw 0.67-0.71 (0.68); pronotum: pl/mpw 0.78-0.98 (0.89); mwp/npw 1.59-1.66 (1.62); bpw/apw 1.28-1.35 (1.32); elytra: mew/mpw 1.81-1.95 (1.90); el/pl 2.83-3.50 (3.11); el/mew 1.42-1.50 (1.45); bew/bew 1.23-1.27 (1.25); bew/mpw 1.48-1.53 (1.51); foreleg: pft/msrw 1.20-1.21 (1.20); ptbl/ptbl 1.33-1.67 (1.48); ptbl/ptbmw 7.00-7.78 (7.33); ptbl/ptbl 0.56-0.59 (0.57); ptbl/rl 0.88-0.99 (0.92); el/ptbl 2.06-2.13 (2.10).

**DIAGNOSIS**: Distinguished from *P. elegantulum* by smaller size and more compact habitus, and most particularly by much reduced size of gular tooth.

**DISTRIBUTION**: Confined to Spain, all the records are from NE Spain.

**BIOLOGY**: The host plant is unknown. It was collected always at 1000 m of altitude or higher. In Soria (Muriel de la Fuente) it was collected in a gallery forest along a river. This habitat is quite variable, often appearing quite black, almost black with metallic gleams only at certain angles; tars dark brown to blackish, even these may have slight metallic gleam (in specimens examined, series from a single locality are either all blue or all green).

**Rostrum**: Male: length 0.62-0.72 (0.67); minimal width 0.10-0.12 (0.11); width at mesorostrum 0.14-0.17 (0.15); at metarosorostrum 0.12-0.15 (0.14); at apex 0.11-0.12 (0.11); brl/rl 0.31-0.35 (0.33). More or less shiny blue-green to green, often appearing darker in apical half; in lateral view evenly and moderately strongly curved, basally forming a straight line with frons, occasionally very weakly angled, in lateral view ventrally barely swollen if at all in mesorostral region and forming very slight angle at juncture with gular region; metarosorostrum variably straight-sided and only slightly narrower than mesorostrum to markedly concave-sided, appearing pinched at narrowest point subbasally in front of small oblique basal buttresses (in which case mesorostrum appears comparatively more swollen); prorostrum very gradually narrowed from mesorostrum, in apical half more or less parallel-sided to apically weakly enlarged; whole rostrum distinctly punctate throughout, including mesorostrum, tending to align in more or less confused rows on metarosorostrum (often forming strong grooves on lateral surfaces, though even here quite variable), smaller and more scattered on prorostrum, sparser and declining in size distally but present to apex; microreticulation on metarosorostrum very light, patchy and ephemeral, occasionally extending onto proximal quarter of prorostrum, rest of prorostrum smooth and shiny, in fact at lower magnification entire rostrum appears shiny; setae very small and hard to see, occasionally one or two visible protruding beyond lateral outline of metarosorostrum.

Female: length 0.77-0.85 (0.82); minimal width 0.10-0.12 (0.11); width at mesorostrum 0.13-0.15 (0.14); at metarosorostrum 0.12-0.14 (0.13); at apex 0.11-0.12 (0.11); brl/rl 0.27-0.31 (0.29). Distinctly longer, with mesorostrum even less thickened; colour less metallic throughout length, copper (in southern specimens) to brassy-black, prorostrum often appearing quite black; in lateral view less curved, straight to weakly angled at juncture with frons, without ventral swelling of mesorostrum; apical enlargement of prorostrum in dorsal view slightly more pronounced (in UK
specimens, not the case in southern Italian specimens); punctate throughout though punctures distinctly smaller and fewer, particularly apically, generally less distinctly aligned on dorsal surface of metarostrum, giving the surface a much smoother appearance (quite strongly grooved on lateral surfaces); microreticulation at most confined to base of metarostrum

**Antennae**: male: club length 0.17-0.23 (0.21); width 0.07-0.09 (0.08); scape length 0.11-0.14 (0.13). Female: club length 0.17-0.22 (0.20); width 0.07-0.09 (0.08); scape length 0.14-0.15 (0.14). Similar in both sexes; slender, moderate length, black to blackish-brown with base of scape obscurely lighter; scape shorter in male (scape l/mesorostral w 0.80-0.93 in all examined male specimens except for single specimen from Drôme, France, 0.65; This specimen has shortest scape combined with broadest mesorostral width), weakly clubbed apically; 1st funicular article elongate-oval, up to 2/3 length of scape in males, a little over ½ in females, equal width to apex of scape (globular and marginally thicker than scape in Drôme specimen), 2nd to 5th articles elongate, progressively shorter and thickly articulated, 6th and 7th articles less differentiated than is usual in Apionidae, neither much longer nor broader, although 7th weakly more globular, thus whole funiculus appearing filiform without sensible widening distally; club elongate-oval, apically tapered, equal to last five articles in length; funicular setae fine, only distally slightly longer than originating article, raised at 30-45° to antenmal axis; setae on club very fine, not obscuring shiny surface, the more erect type of setae so fine as to be barely visible.

**Head**: male: length 0.28-0.32 (0.31); width 0.33-0.38 (0.36); eye length 0.19-0.22 (0.20). Female: length 0.31-0.35 (0.32); width 0.34-0.38 (0.36); eye length 0.19-0.23 (0.20).

Similar in both sexes; wider than long, widest at base of neck, widening from posterior margin of eyes; eyes moderately large, strongly convex, anterior margin circa 80° to longitudinal axis; frons as wide as metarostral width, erratically quadristriate, usually quite strongly and sharply delineated but occasionally partially effaced, with small round to subelongate punctures discretely and irregularly scattered among the sculpturing, microsmooth surface smooth and shiny (Drôme specimen has microreticulation anteriorly towards base of rostrum), colour most often distinctly bluish even in specimens which are otherwise quite green; vertex narrow to very narrow, more or less sparsely but distinctly punctate (size roughly equal to one ommatidium), flat in males, weakly raised in females; temples narrowly punctate around eye in irregularly single row; gular region coriaceous to hind margin of eyes, posteriorly sharply demarcated from neck by transverse constriction giving ventral outline a slightly slrangulated appearance in lateral view, with small but usually sharp gular tooth; dorsal surface of neck shiny and smooth with weak to virtually absent transverse striation, ventral surface much more distinctly transversely striated; gular suture distinct; setae minute and sparse, easily overlooked.

**Protonotum**: male: length 0.46-0.52 (0.49); width at apex 0.41-0.5 (0.46); width at base 0.52-0.64 (0.58); maximum width 0.52-0.64 (0.58). Female: length 0.49-0.55 (0.52); width at apex 0.43-0.49 (0.46); width at base 0.56-0.63 (0.59); maximum width 0.56-0.63 (0.59).

Similar in both sexes; wider than long; base weakly biarcuate to bowed or even almost straight, with edge sharply demarcated; posterior lateral angles more or less right-angled, often briefly and abruptly flared, almost as if rimmed, lateral outline weakly swollen to widest a little anterior of midpoint, from thence quite abruptly constricted to form anterior collar, anterior margin not swollen, thus lateral margins of collar more often perpendicular than weakly recurved; pre-ommatridial fovea strong, deep, broadly linear, extending from close to basal margin to slightly anterior of midpoint, occasionally extended further forward as much narrower and shallower line (two female specimens from Potenza in southern Italy show reduced fovea barely reaching midpoint); punctures strong, round, distinctly demarcated, equal in size to at least two ommatidia, interstices less than half diameter of punctures except in a few small smooth patches and a more or less clearly defined sub-basal impunctate band; setae small, indistinct, scarcely overreaching originating puncture; surface smooth to very weakly and finely microreticulate, appearance shiny, metallic.

**Scutellum**: small, rather variable in shape from isodiametric (seldom) to slightly elongate (usual), either parallel-sided with rounded apex to sub-triangular with more pointed apex; surface more or less smooth to centrally lightly grooved or even uni- or bipunctate.

**Elytra**: male: length 1.42-1.61 (1.51); width at base 0.75-0.89 (0.83); maximum width 0.94-1.10 (1.02). Female: length 1.49-1.64 (1.59); width at base 0.80-0.89 (0.85); maximum width 1.02-1.12 (1.08). Elongate oval with moderately prominent rounded humeri, widest at around middle, with little or no swerve in outline subhumeraly, apically moderately and variably elongate-rounded with distinct broadly rounded apical margin or ‘bow’, often reduced in males with their generally steeper apical declivity; striae narrow, distinct, sharply demarcated to apex, half as wide as interstriae, sutureal stria not reaching scutellum, sometimes by as much as the length of the scutellum, 3rd stria basally more or less excurred, strial punctures contained, not affecting stria margin; humeral callus small but distinct; interstriae sub-flat to weakly convex, minutely uni- or bi-serially punctate, not or only weakly transversely pleated or grooved but with quite extensive transverse microsculpture, giving elytra a more velvety appearance by comparison with head and pronotum; setae small and fine, not overlapping but quite distinct where they catch the light.

**Legs**: male foreleg: femoral thickness 0.18-0.21 (0.19); tibial length 0.66-0.79 (0.74); maximum tibial width 0.09-0.11 (0.10); tarsal length 0.40-0.46 (0.43). Female foreleg: femoral thickness 0.18-0.19 (0.18); tibial length 0.69-0.77 (0.73); maximum tibial width as male; tarsal length 0.40-0.44 (0.43). Slender, sexually undifferentiated; femora elongate, slender, profemora not noticeably larger; protibiae straight, slender, widening steadily from proximal articulation without any sudden increases, apex weakly enlarged externally, hardly at all internally, apical comb of setae fine and short, not very noticeable, surface finely punctate and more or less microreticulate, setae small and fine, white; meso- and metatibiae sometimes slightly curved, moderately expanded apically; tarsi moderately elongate (protarsi longer in both sexes); protarsal 1st tarsomere circa 2 x longer than wide in males, 1.5-2 x in females, 2nd tarsomere triangular with narrow effaced shoulders at proximal articulation, straight sides, apically as wide as or wider than long, lobes of 3rd tarsomere elongate-oval, onychium extended beyond lobes by half its length; tarsal claws acutely dentate but tooth is small, claw apex fine and sharp; all tarsal segments finely and sparsely punctate on
smooth shiny surface, tarsal setae fine, hairlike, yellowish, not obscuring background.

Genitalia: Aedeagus. Median lobe (fig. 3c, 4c) slender, strongly bent at apex, ball pointed. Tegmen (fig. 5c) wide, with prostegium articulated to free ring.

INDICES: male: head: hl/hw 0.77-0.91 (0.86); eyl/eh 0.59-0.73 (0.65); rostrum: rl/pl 1.28-1.48 (1.36); rl/msrw 4.00-4.67 (4.46); brl/r 0.31-0.35 (0.33); mswr/mtrsw 1.07-1.21 (1.11); mswr/arw 1.25-1.55 (1.34); mswr/minrw 1.25-1.55 (1.38); mswr/eyl 0.68-0.85 (0.75); brl/eyl 1.00-1.21 (1.10); antenna: scl/msrw 0.65-0.93 (0.88); acl/acw 2.25-2.63 (2.51); pronotum: mwp/hw 1.51-1.78 (1.61); bwp/apw 1.20-1.39 (1.26); pl/mpw 0.78-0.90 (0.86); mew/mpw 1.70-1.88 (1.77); elytra: el/pl 2.87-3.22 (3.04); el/mew 1.42-1.51 (1.47); mew/bew 1.19-1.33 (1.24); bew/mpw 1.34-1.51 (1.43); foreleg: ptbl/pl 1.40-1.53 (1.49); ptbmw 6.64-8.33 (7.14); ptbl/ptbl 0.55-0.63 (0.59); ptbl/r 1.03-1.16 (1.10); el/ptbl 1.95-2.14 (2.04).

Female: head: hl/hw 0.84-0.94 (0.90); eyl/eh 0.58-0.66 (0.63); rostrum: rl/pl 1.43-1.69 (1.58); rl/msrw 5.13-6.15 (5.75); brl/r 0.27-0.31 (0.29); mswr/mtrsw 1.07-1.15 (1.08); mswr/arw 1.18-1.27 (1.25); mswr/minrw 1.25-1.50 (1.36); mswr/eyl 0.65-0.75 (0.70); brl/eyl 1.04-1.26 (1.18); antenna: acl/acw 2.13-2.63 (2.45); scl/msrw 0.87-1.15 (1.00); pronotum: pl/mpw 0.82-0.91 (0.87); mwp/hw 1.50-1.70 (1.64); bwp/apw 1.24-1.33 (1.28); elytra: mew/mpw 1.75-1.89 (1.81); el/pl 2.81-3.31 (3.07); el/mew 1.40-1.55 (1.48); mew/bew 1.21-1.31 (1.26); bew/mpw 1.35-1.50 (1.43); foreleg: pt/ mswr 1.20-1.38 (1.30); ptbl/pl 1.29-1.55 (1.42); ptbl/ptbmw 6.36-8.11 (7.32); ptbl/ptbl 0.55-0.63 (0.58); ptbl/r 0.87-0.94 (0.90); el/ptbl 2.04-2.25 (2.17).

DIAGNOSIS: Distinguished from P. alonsochrysomimus by elongate antennal club and finer, shorter antennal setae; from P. dumei by more compact body with proportionally shorter legs and rostrum.

DISTRIBUTION: Widespread in Europe from SW France to Russia, northward to England (UK), Denmark, southern Sweden and southern Norway. There are further records eastward to Eastern Siberia and southward to Morocco, Algeria, Tunisia, Syria and Turkey. However, all specimens examined from Sicily, Greece and Turkey represent new, as yet undescribed species. All records beyond the confines of Europe need confirmation.

BIOLOGY: Reputedly oligophagous on various Astragalus spp. In northern Europe it appears to be confined to Astragalus glycyphyllos L. Hoffmann (1958) quoted Astragalus virgatus Pall., A. mossspulcianus L., A. sempervirens Lam. and A. vesicarius L. as host plants, but he included the good species Pseudoprotopia argentea (Becker, 1864) as a variety of P. astragali, thus confusing the host plants of both species. For now the suspicion remains that oligophagy is unlikely, or at least more limited than the literature would suggest.

The development has been observed by Dieckmann (1977). One larva was observed to develop in flower buds of A. glycyphyllos, while three other larvae were found dead in other buds. The first larva ate the internal parts of the flower bud and pupated inside the calyx. Females with eggs inside were found in May but not in July. Imagoes are present from April to October.


Pseudoprotopia elegantulum (Germar, 1818)

Fig. 2e. Apion eleganztum Germar, 1818.

DESCRIPTION

Size: male: 2.25-2.52 (2.43), 9 specimens. Female: 2.12-2.55 (2.40), 16 specimens.

ROSTRUM: male: length 0.69-0.74 (0.71); basal rostral length 0.21-0.22 (0.21); minimum width 0.11-0.12 (0.11); width at mesorostrum 0.16-0.18 (0.17); at metarostrum 0.14-0.16 (0.15); at apex 0.11-0.12 (0.12). Female: length 0.71-0.85 (0.80); basal rostral length 0.20-0.25 (0.23); minimum width 0.10-0.12 (0.11); width at mesorostrum 0.14-0.16 (0.15); at metarostrum 0.13-0.14 (0.14); at apex 0.10-0.12 (0.12). Moderately short and robust, in lateral view moderately curved, less so basally where dorsal outline is continuous with frons, ventrally with no distinct swelling of mesorostrum, forming a distinct obtuse angle at juncture with gular region; metarostrum short, thick, often rather concave-sided due to variable degree of basal buttress flare and mesorostral thickening, noticeably thicker than prorostrum, dorsally rather finely and indistinctly punctate, distinctly and evenly microreticulate, this continued over mesorostrum and more or less proximal half of prorostrum, lateral grooves on metarostrum variable from weak to strong; mesorostrum variably but not greatly swollen, proximally less abruptly than in P. tricarinatum; prorostrum cylindrical to apex which is not widened, finely and sparsely punctate although more noticeable than on metarostrum at higher magnification due to smoother surface, apically almost impunctate (punctures altogether less evident than in P. tricarinatum).

Antennae: male: scape length 0.11-0.13 (0.12); club length 0.20-0.23 (0.21); width 0.08-0.09 (0.09). Female: scape length 0.11-0.14 (0.12); club length 0.18-0.21 (0.20); width 0.08-0.10 (0.09). Little difference between both sexes; brownish-black, occasionally scape lighter at base; scape distinctly shorter than mesorostral width, apically variably clubbed, mostly often rather gradually, occasionally more abruptly; 1st funicular article 1.6-2 times longer than wide, rather oval, at least as thick as apex of scape, 2-5th articles decreasingly longer than wide, each only weakly inflated subapically,
thickly-articulated, close-set (2nd narrowest basally), 6th similar to 5th, marginally broader, 7th broader, isodiometric; club 2-2.5 times as long as wide (on average longer in males), obconic with tapered apex, equal in length to last four funicular articulated, finely setose, surface not obscured; funicular setae fine, not longer than originating article, raised at circa 25° to antennal axis, thicker on distal articles.

**Head:** male: length 0.33-0.36 (0.35); width 0.34-0.36 (0.35); eye length 0.18-0.21 (0.21). Female: length 0.30-0.37 (0.34); width 0.31-0.36 (0.34); eye length 0.18-0.22 (0.21). As wide as long, often appearing longer due to variably conical shape, widest basad, narrowest in line with rear margin of vertex and weakly swollen temples, otherwise narrowest at posterior margin of eyes; eyes prominent, variably rounded with anterior angle of 45-60° to longitudinal axis, never the widest part of head; frons normally a bit narrower than metatormstrum, very variably 3-5 carinate, from reduced and partially effaced against a relatively smooth background, to strongly carinate against a more sculptured background, the carinæ often extending to fan out anteriorly and the central carina often extending posteriorly further than the lateral ones, any punctures on frons tending to be confined to postero-lateral areas; vertex sparsely to quite densely punctate, often raised posteriorly, particularly when rear margin is also narrowest part of head, surface microreticulate (as in frons); temples in lateral view quite broad (equal to circa three rows of ommatidia) with large, shallow, uni- or biseriate punctures, these usually separated from margin of eyes by a smooth impunctate area; gular region ventrally with prominent bifurcate backward-pointing median tooth on posterior margin, this a very distinctive character of the species; neck shiny, transverse grooves very fine; setae on head not visible.

**Pronotum:** male: length 0.50-0.55 (0.53); width at apex 0.44-0.47 (0.46); at base 0.56-0.61 (0.59); maximum width 0.56-0.62 (0.59). Female: length 0.45-0.56 (0.51); width at apex 0.41-0.48 (0.45); at base 0.52-0.61 (0.57); maximum width 0.53-0.62 (0.59). Slightly broader than long, broadest in middle, distinctly narrowed basally to either right-angled or briefly expanded (flared) basal angles, making base sometimes almost as wide as median width, anteriorly narrowed with little or no swerve in outline (basal constriction usually much more marked than apical constriction), anterior margin more or less straight in dorsal view, not or only weakly raised, base bowed to very weakly biarcuate; prescutellar fovea long, narrow, sharply defined, reaching well forward of midpoint and often almost to front margin; punctuation strong, variably close-set (most crowded centrally), rarely separated by more than their own diameter, usually by much less, each puncture equal to at least two ommatidia; setae minute, contained within puncture, hardly evident.

**Scutellum:** small, rather variably elongate-oval, convex, usually (but not always) deep-set, as if peering out of a pocket.

**Elytra:** male: length 1.60-1.73 (1.68); width at base 0.84-0.90 (0.87); maximum width 1.09-1.16 (1.12). Female: length 1.38-1.82 (1.60); width at base 0.75-0.88 (0.84); maximum width 0.95-1.15 (1.09). Oval, widest at or a bit behind middle, posteriorly often more rounded than tapered, apical declivity steep but less so than in *P. tricarinatum*, revealing more of the apical marginal ‘prow’ which also forms a more obtuse angle laterally at the point of disappearance under the elytral bulge; humeri oblique, rounded, forming angle of 45-70° to midline, even if only briefly, elytral outline subhumbly weakly swerved to not at all, depending much on the relative development of the humeral callus; elytral striae strong to apex, approximately half the width of interstriae though often appearing wider due to variably distinct convexity of the latter shadowing the strial margins (this convexity varies from slight to strong but most usually more than in *P. tricarinatum*), sutural stria not or barely reaching apex of scutellum, 3rd striae basally not or only very weakly excurred; interstriae rather smooth and shiny, only weakly creased and with very shallow, almost ephemeral microreticulation, punctures confusedly uni- to biseriate, very small and shallow, often barely visible, setae minute, fine, barely visible, appearance glabrous.

**Legs:** male foreleg: tibial length 0.77-0.84 (0.81); maximum tibial width 0.09-0.11 (0.10); femoral thickness 0.19-0.20 (0.20); tarsal length 0.43-0.48 (0.45). Female: tibial length 0.67-0.80 (0.75); maximum tibial width 0.09-0.12 (0.11); femoral thickness 0.17-0.21 (0.19); tarsal length 0.35-0.45 (0.42). Both sex: Moderately slender though comparatively more robust than in *P. tricarinatum*; profemora relatively more developed than meso- and metafemora, all femora more muscular; all tibiae straight, slender, with exceedingly fine, hairlike setae, difficult to see; protibiae apically weakly enlarged internally, hardly or not at all externally, apical spines small and few with a small cluster of relatively larger spines on ventral-internal side, punctuation along length of proibia discrete and isolated but distinctly visible against smoother, shinier background; meso- and metatibiae apically weakly enlarged but still distinctly more so than in *P. tricarinatum*; tarsi elongate, protarsi longer than meso- and metatarsi, 1st protarsomere at least twice as long as wide, 2nd triangular, a little longer than apically wide, lobes of 3rd more narrowly oval and apically often more acutely rounded, onychium apically more expanded and protruding by half its length or less, tarsal claws distinctly more robust, though still fine, hooked and triangularly dentate; 1st mesotarsomere less than twice as long, 2nd isodiometric; 3rd metatarsomere shorter than 1st mesotarsomere, often rather curved in profile and thickened apically, more noticeably in males; all tarsal setae very fine, hairlike, not obscuring smooth, lightly punctate surface; tarsi often more obviously brown than in *P. tricarinatum*, though still very dark.

**Genitalia:** Aedeagus. Median lobe (fig. 3a, 4a) wide in lateral view, but thin in the apical part, recurved at apex. Tegmen (fig. 5a) with prostegium fused to ring.

**Indices:** male: head: hl/hw 0.92-1.03 (0.98); eyl/hl 0.51-0.64 (0.59); rostrum: rl/msrw 3.74-5.07 (4.27); rl/pl 1.27-1.42 (1.35); brl/r 0.28-0.31 (0.30); mssrw/mtrw 1.13-1.19 (1.14); mssrw/awr 1.27-1.58 (1.46); mssrw/minrw 1.40-1.58 (1.48); mssrw/eyl 0.70-0.90 (0.82); brl/eyl 1.00-1.17 (1.05); antenna: scl/msrw 0.67-0.92 (0.76); acl/acw 2.33-2.56 (2.40); pronotum: mpsw/hw 1.57-1.77 (1.66); bwp/apw 1.22-1.33 (1.29); pl/ptsw 0.83-0.96 (0.90); elytra: mmpw/1.81-1.96 (1.88); pl/ptsw 3.02-3.27 (3.16); el/mew 1.45-1.55 (1.50); mew/bew 1.25-1.33 (1.29); bew/mepw 1.42-1.50 (1.46); foreleg: pl/mssrw 1.17-1.25 (1.21); plb/pl 1.49-1.61 (1.53); plb/plmmpw 7.45-8.56 (7.87); ptsb/ptbl 0.52-0.59 (0.55); plb/rl 1.11-1.20 (1.15); el/ptbl 1.99-2.15 (2.07).

Female: head: hl/hw 0.91-1.06 (0.99); eyl/hl 0.56-0.63 (0.60); rostrum: rl/pl 1.48-1.71 (1.55); brl/rl 0.26-0.32 (0.29); rl/msrw 4.53-5.67 (5.16); mssrw/mtrw 1.07-1.23 (1.14); mssrw/awr 1.25-1.50 (1.35); mssrw/minrw 1.25-1.60 (1.43); mssrw/eyl 0.68-0.79 (0.75); brl/eyl 0.95-1.28 (1.12); antenna: acl/acw
1. Head and pronotum metallic, blue/green .......................... 2
   - Head and pronotum black ............................................. 4

2. Large species (♂♂ 2.4-3 mm, ♀♀ 2.7-3 mm), legs and:
   - Gular tooth small ........................................ 4
   - Gular tooth prominent ........................................ 3

3. Antennae setose, last three articles of funiculus with semi-
   - Antennal setae fine, short, not outstanding; antennal club 
     elongate (club length/width 2.25-2.65), setae not distinct
     .................... dumei .........................
   - Smaller species (♂♂ 2.1-2.5 mm, ♀♀ 2.3-2.7 mm), legs
     shorter (prothorax length; ♀♀ 0.66-0.85, ♀♀ 0.7-0.87 mm)
     .......... 3

4. Antennae setose, last three articles of funiculus with semi-
   - Antennal setae fine, short, not outstanding; antennal club 
     elongate (club length/width 2.25-2.65), setae not distinct
     ........................................... alonschrysochominus
   - Antennal setae small ......................................... 4

Gular tooth prominent ........................................... eleganctum
   - Gular tooth small ........................................... tricarinatum

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