

A REVISION OF THE GENUS *PSEUDOPROTAPION* 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. dumei* (Hoffmann, 1957) **stat. prom.** is a good species, not a subspecies of *P. astragali* (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. astragali astragali* 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. *angustifolia* in xerothermic sites. *Trichomalus* sp. is recorded as a pupal parasitoid of this insect.

Key words: Apionidae, *Pseudoprotapion*, new species, biology, parasitoid, Pteromalidae, *Trichomalus*, Spain, *Ononis tridentata*, gypsum soils.

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

Resumen: Se revisan las especies ibéricas de *Pseudoprotapion*. Se encontraron tres especies. *P. alonsochrysomimus* **n. sp.** es una nueva especie del este y el sureste de España. *P. dumei* (Hoffmann, 1957) **stat. prom.** es una buena especie, no una subespecie de *P. astragali* (Paykull, 1800). Fue descrita de Marruecos y es un nuevo registro para Iberia. *P. tricarinatum* (Waltl, 1835) **stat. rev.** es una buena especie, previamente en sinonimia de *P. elegantulum* (Germar, 1818). Las dos especies que habían sido registradas hasta ahora en los catálogos de España, *P. astragali astragali* y *P. elegantulum* no se encontraron en este estudio y son registros dudosos para la Península Ibérica. Podrían estar presentes, pero sólo en las zonas septentrionales. Por último, se presentan los estados preimaginales y el ciclo biológico de *P. alonsochrysomimus*. La larva se desarrolla en capullos de *Ononis tridentata* subsp. *angustifolia* en sitios xerotérmicos. *Trichomalus* se registra como un parasitoide de la pupa de este insecto.

Palabras clave: Apionidae, *Pseudoprotapion*, especie nueva, biología, parasitoide, Pteromalidae, *Trichomalus*, España, *Ononis tridentata*, suelos yesíferos.

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

Introduction

As part of a survey of Western Palaearctic Piezotrachelini 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 Palaearctic 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. astragali astragali* (Paykull, 1800) and *P. elegantulum* (Germar, 1818). The records from Spain of *P. elegantulum* are only cited by Iglesias (1920, 1928), from two distant places, Andalusia and Ourense. Alonso-Zarazaga (pers. com.) reported one specimen from Albacete in coll. of Autónoma University of Madrid. *P. astragali* is recorded by several authors: Iglesias (1920); Navás (1921, 1923, 1924); Roudier (1954); Santos, Mateos & Viñolas, 2009; Sanz & Gurra 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 undeter-

mined, but had been collected persistently on *Ononis tridentata* L. subsp. *angustifolia* (Lange) Devesa & G. López (Fabaceae, Ononideae) 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, metarostral 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 30SXJ96, 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; bew, basal elytral width; bpw, basal pronotal width; brl, basal rostral length (from front of eyes to antennal insertion); el, elytral length; eyl, eye length; hl, head length; hw, head width; mew, maximum elytral width; minrw, minimum rostral width; mpw, maximum pronotal width; msrw, mesorostral width; mtrw, minimum metarostral width; pft, maximum profemoral thickness; pl, pronotal length; ptbl, protibial length; ptbmw, maximum protibial width (excluding any vestiture on inner margin); pttl, protarsal length; rl, rostral length; scl, antennal scape length.

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

Collections studied: AVC: Antonio J. Velázquez de Castro (Valencia, Spain), CG: Carlo Giusto (Genova, Italy), GALZ: Gabriel Alziar (Cassagnes-Bégonhès, France), MGM: M. G. Morris (Dorchester, UK), MK: Michael Kostal, MIR: Mark I. Russell (Llangoed, UK), MNCN: Museo Nacional de Ciencias Naturales (Madrid, Spain), PJH: Peter J. Hodge (Lewes, UK).

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 dumei* 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

Wagnerium Alonso-Zarazaga, 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 mesorostrum weakly dilated.

Eyes round, more or less convex, ventrally closer than dorsally. Frons flat with 3-5 more or less superficial carinae/striolae. 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, apically 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 I 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. kuenburgorum* (Reitter, 1898), from central Asia, Armenia and Turkey is the only other western Palaearctic Piezotracheline 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 Galegeae (*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. alonsochrysomimus* with *Ononis tridentata* L. (Trifolieae). 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. dumei* and *P. alonsochrysomimus*. Species making up the blue and black group have been recorded from *Onobrychis viciifolia* Scop. (Hedysareae) (Dieckmann, 1977). The organ of the plant in which the larvae develops is unknown.

***Pseudoprotapion alonsochrysomimus* 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 almost purple, often appearing black according to light; legs also metallic, though darker and easily appearing black, tarsi dark brown to almost black.

Rostrum: Male: length 0.75-0.80 (0.78); width, minimum 0.10-0.12 (0.11); minimum at metarostrum 0.13-0.16 (0.14); mesorostrum 0.16-0.18 (0.17); apex 0.11-0.12 (0.12). Colour dark greenish blue on metarostrum, gradually turning coppery to brassy black on prorostrum, appearing black in indirect lighting; metarostrum more or less parallel-sided, insignificantly enlarged basally, very slightly and gradually thickened at mesorostrum, then gradually narrowed for proximal half of prorostrum, distal half cylindrical, parallel-sided to very weakly enlarged apically, barely noticeable; in lateral view dorsal outline basally continuous with frons to weakly angled (the latter more commonly), from there whole rostrum curved, more strongly in apical half of prorostrum; ventrally mesorostrum only feebly enlarged, weakly angled at ventral juncture with metarostrum; punctures on metarostrum distinct, aligned each side of bare midline, laterally stronger, set into grooves giving the whole a sinewy appearance; punctures on prorostrum smaller, elongated, separated by more than their diameter in both relevant axes, decreasing markedly in size apically; whole rostral surface smooth and shiny, sometimes metarostrum more or less basally with scratchy, confused and weak microsculpture dorsally, extending forward from frons.

Female: length 0.88-0.99 (0.93); width, minimum 0.10-0.12 (0.11); minimum at metarostrum 0.13-0.15 (0.14); at mesorostrum 0.15-0.18 (0.16); at apex 0.1-0.13 (0.12). Greenish colour confined to base of metarostrum and coppery colour often turning almost purple towards apex, appearing similarly black in indirect lighting; metarostral width as in

male but appearing thinner due to greater length (brl/rl being more or less equal in both sexes); longer prorostrum often more distinctly widened apically, sometimes hardly at all; in lateral view angle between frons and metarostrum very weak to absent, and curvature of whole rostrum less pronounced; both ventral swelling of mesorostrum and angle of juncture with metarostrum even weaker; punctation similar, though punctures even smaller throughout prorostral length and fewer on metarostrum; whole surface equally shiny and smooth, with any basal metarostral microsculpture further reduced.

Antennae: Male: scape length 0.14-0.15 (0.14); club length 0.17-0.20 (0.19); width 0.09-0.10 (0.10). Female: scape length 0.15-0.17 (0.16); club length 0.17-0.19 (0.18); width 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, l/w ♂♂ 1.80-2.00 (1.94); ♀♀ 1.64-2.11 (1.85), the only known Western Palaearctic species with mean < 2.00; club remarkably setose, each segment appearing hirsute 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. Palaearctic 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-mounted, with the head greatly extended: l/w ♂♂ 0.95-1.03 (0.98), ♀♀ 0.92-1.06 (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 posteriad 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*.

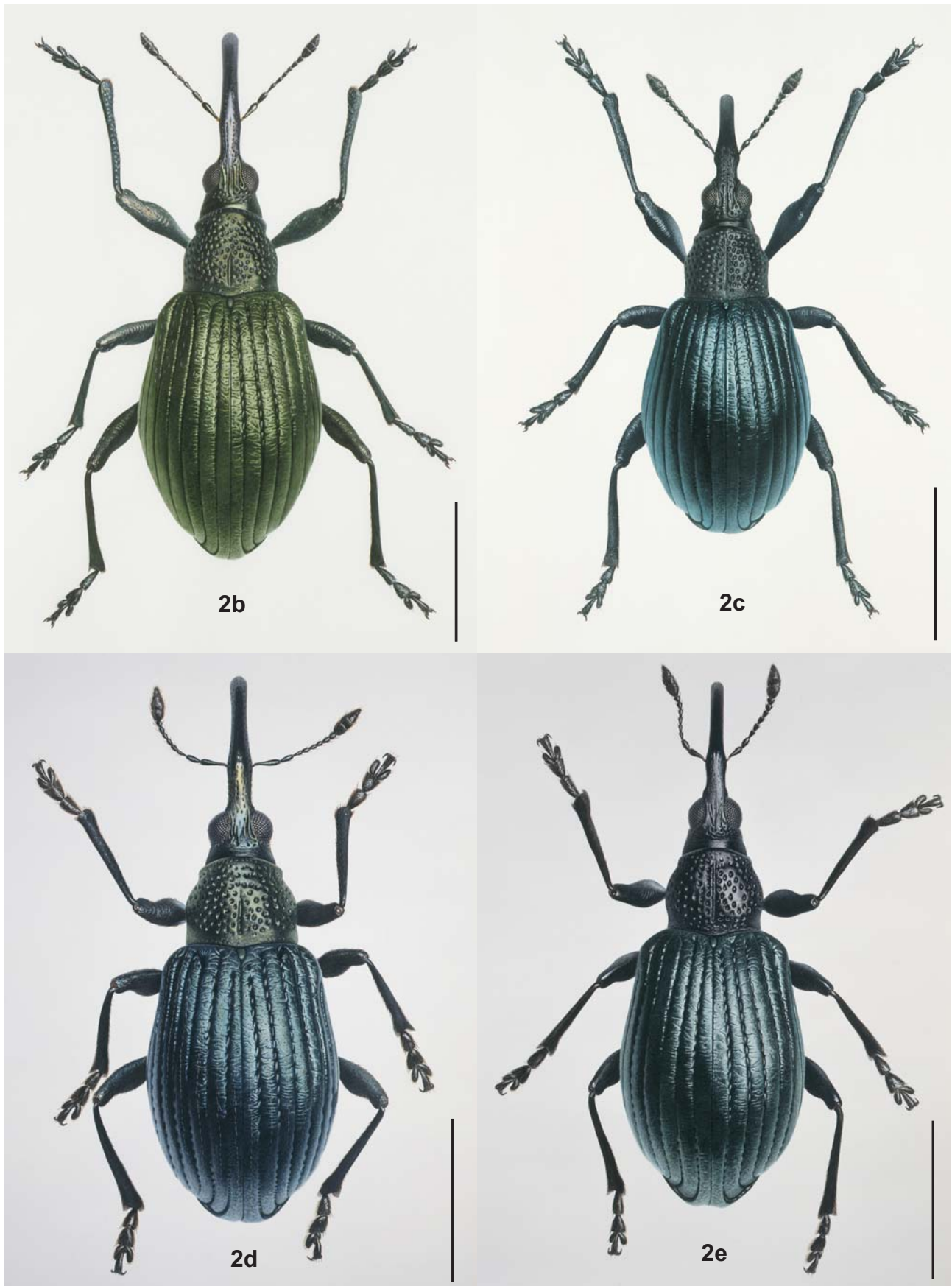


Figure 2b-e. Habitus of adults of *Pseudoprotapion*. **2b)** *P. dumei*; **2c)** *P. tricarinatum*; **2d)** *P. astragali*; **2e)** *P. elegantulum*.

♂♂ 0.82-0.86, m 0.84; ♀♀ 0.84-0.90, m 0.87; base weakly bisinuate to merely bowed; widest at base; sides subparallel to weakly convergent from base for approximately two thirds of length, then gently convergent to apical "collar" which has lateral sides variably parallel to more or less outwardly swollen (w base/w apex ♂♂ 1.30-1.38, m 1.33; ♀♀ 1.27-1.36, m 1.32); prescutellar fovea strong, narrow knife-like cut extended forward to midpoint or slightly beyond (in one male extended further forward as very fine shallow line), posteriorly often originating unusually distant from basal margin by as much as diameter of two average pronotal punctures; punctures strong and crowded, interstices mostly less than half diameter of punctures, punctures more or less round to roughly hexagonal; narrow sub-basal region impunctate or sparsely micro-punctate; setae exceedingly fine, barely overreaching margin of originating puncture, easily overlooked altogether; microsculpture fine but distinct shagreening, appearance shiny green to blue-green, often with golden-orange gleams particularly along anterior margin, sometimes more brassy; in lateral view dorsal surface flat to weakly bowed.

Scutellum: 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, m 1.43), outline a continuous smooth curve from humeral region to apical region, broadly widest at or slightly posteriad of midpoint (some individuals of both sexes exhibit a very slight swerve in outline post-humerally), apical bow 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, sutural stria not reaching scutellum, 3rd and sometimes 4th excurved basally; stria punctures small, numerous, separated by at most twice their diameter and not encroaching on interstitial margins; interstriae flat to very weakly convex, finely but distinctly cross-hatched into vague shallow "boxes" containing the minute and confusedly uniserial interstitial punctures, these last occasionally doubling up, setae very fine, white and short, not overlapping, virtually invisible except laterally in subhumeral region; microsculpture fine and shallow but distinct, giving the whole surface a glowing rather than glittering appearance.

Legs: male foreleg: femoral thickness 0.19-0.22 (0.20); tibial length 0.77-0.85 (0.81); maximum tibial width 0.10-0.12 (0.12); tarsal length 0.45-0.50 (0.47). Female foreleg: femoral thickness 0.19-0.22 (0.20); tibial length 0.80-0.87 (0.83); maximum tibial width 0.11-0.12 (0.12); tarsal length 0.44-0.49 (0.46).

Various metallic green to almost black with muted green gleams, the latter more so on tibiae, tarsi very dark brown; femora moderately slender, quite strongly punctate-granulate preapically, profemora slightly but visibly more robust; protibiae moderately long and straight, widening evenly from base to apex with very little or no special thickening apically (l/w ♂♂ 6.42-7.70, m 6.91, SD 0.44; ♀♀ 6.75-7.64,

m 7.16, SD 0.24), apical comb of setae fine and short, indistinct, setae of preapical internal comb also short but dense, general surface setae very fine, small, white, surface punctate and microsculptured, punctures genally isolated but sometimes tending to confluent rugosity distally in some lighting; meso- and metatibiae straight (mesotibiae sometimes weakly bowed), briefly expanded apically; tarsi moderately short for the genus (protarsal length/protibial length ♂♂ 0.54-0.63, m 0.59; ♀♀ 0.54-0.58, m 0.56); 1st tarsomere x2 longer than wide, slightly more on protarsi, 2nd sharply triangular, isodiametric to a little longer than wide, again more so on protarsi, lobes of 3rd small, elongate, onychium protruding by half its length, tarsal claws small, fine, dentate; tarsal setae fine, hair-like, golden-brown, not obscuring smooth shiny surface; punctuation small, isolated.

Genitalia: Aedeagus (fig. 3e, 4e). Median lobe ended in a small ball, less curved than in *P. astragali*. Tegmen (fig. 5e) with prostegium articulated to free ring. Spiculum gastrale (fig. 6b) "Y" shaped.

INDICES: Male: Rostrum: brl/rl 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/rl 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).

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

Elytra: mew/mpw 1.68-1.80 (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/mpw 1.39-1.47 (1.42); el/ptbl 1.87-1.99 (1.93). Legs: pft/msrw 1.11-1.25 (1.20); ptbl/pl 1.51-1.68 (1.57); ptbl/ptbmw 6.42-7.70 (6.91); ptsl/ptbl 0.54-0.63 (0.59); ptbl/rl 1.00-1.09 (1.04).

Female: Rostrum: brl/rl 0.29-0.33 (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/rl 0.29-0.33 (m. 0.31); brl/eyl 1.23-1.45 (1.33). Antenna: scl/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).

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

Elytra: mew/mpw 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/mpw 1.38-1.47 (1.43); el/ptbl 1.98-2.12 (2.04). Legs: pft/msrw 1.19-1.40 (1.23); ptbl/pl 1.42-1.55 (1.48); ptbl/ptbmw 6.75-7.64 (7.16); ptsl/ptbl 0.54-0.58 (0.56); ptbl/rl 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), C-form, 2.6 mm length approx., 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 posterolateral setae, metanotum with a pair of dorsal setae, femur with one apical setae, abdomen without setae. Pseudocerci long and parallel.

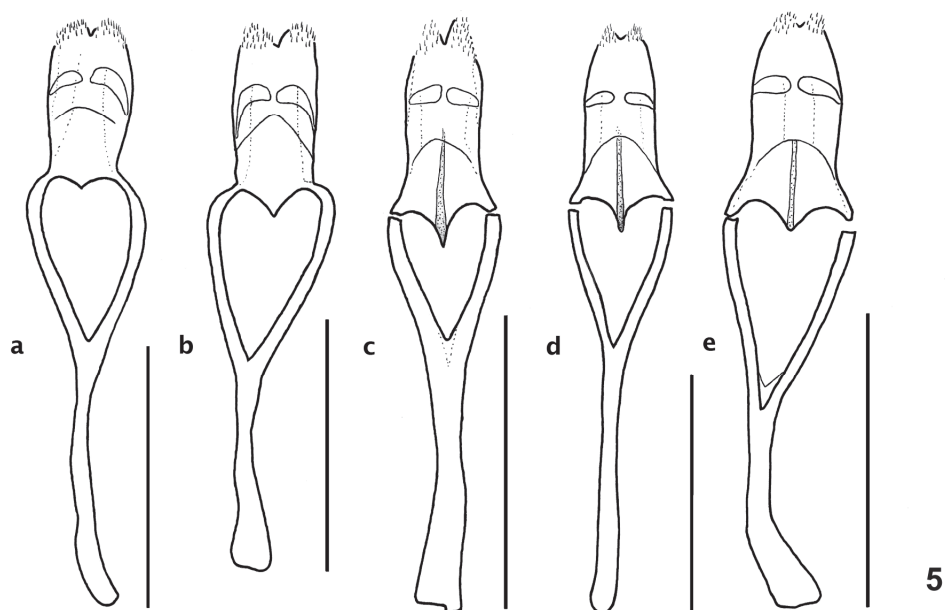
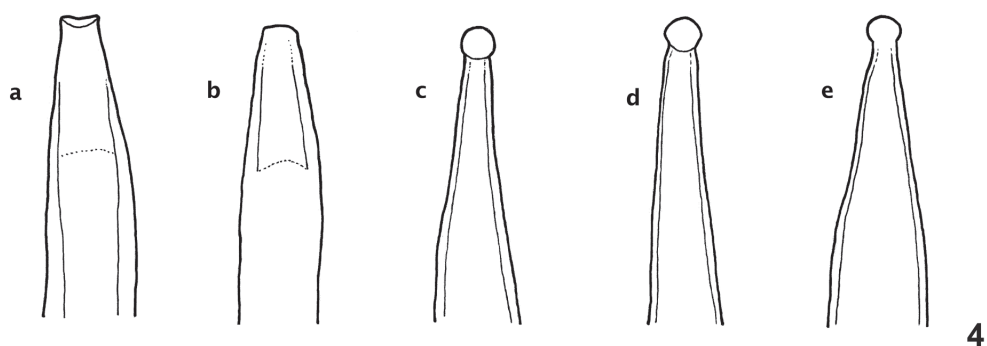
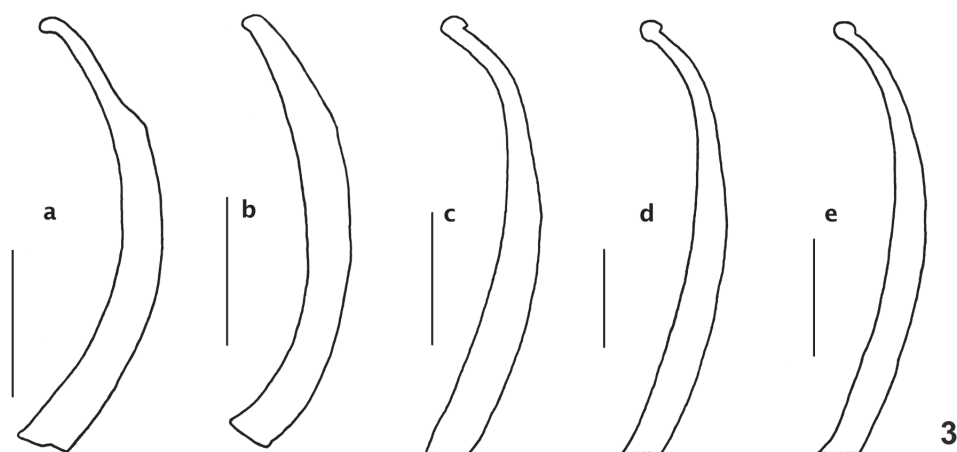


Figure 3. Median lobe of aedeagus, lateral view. a. *elegantulum*; b. *tricarinatum*; c. *astragali*; d. *dumei*; e. *alonsochrysomimus*. Bar = 0.2 mm. **Figure 4.** Median lobe of aedeagus, ventral view. a. *elegantulum*; b. *tricarinatum*; c. *astragali*; d. *dumei*; e. *alonsochrysomimus*. **Figure 5.** Tegmen of aedeagus of *Pseudoprotapion*. a. *elegantulum*; b. *tricarinatum*; c. *astragali*; d. *dumei*; e. *alonsochrysomimus*. Bar = 0.4 mm.

ADULT DIAGNOSIS: Most readily distinguished from other metallic Iberian species by strongly setose antennae and compact antennal club.

ETYMOLOGY: from Greek "chrysos", gold, and "mimos", an imitator. This noun in apposition means that the bright colour of this species imitates the brilliant career of our dear co-

league 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).

BIOLOGY:

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. The egg stage is brief; in the laboratory one egg was observed to hatch in four days. Larvae were observed inside the flowers from the second half of April to the end of May. Pupae 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 nominotypical 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 (Los 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 larvae studied died as a consequence of para-

sitoidism. A single parasitoid emerged from each; one of them was studied and moulted to pupa but then died. Its shape and biology make it a possible member of Hymenoptera Eulophidae (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).

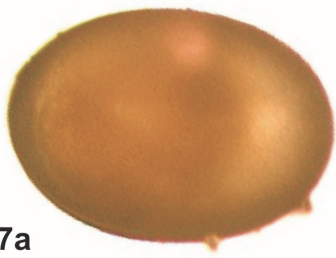
(Locality data: Chelva 30SXK70, 430 m, Cofrentes 30SXXJ63, 776 m)

OTHER SPECIMENS EXAMINED: all of them were collected by the second author except when stated. **Alicante.** 1 ex. Montnegre 30SYH16, 410 m, 3-v-1991 (CVC). **Castellón.** 1 ex Montanejos 30SYK13, 500 m 20.iv.1993 (CVC). **Granada.** 1 ex. Baza 30SWG18, 1000 m 13-viii-1991 (MNCN). **Murcia.** 6 ♂♂, 3 ♀♀, 5 ex. Fortuna 30SXH62, 200 m, 13-iv-1998 (CVC). 6 ♂♂, 4 ♀♀ Jumilla 30SXH35, 647 m, Triassic soils, *O. tridentata* 20.vii.2013, J.L. Lencina leg. (CVC). **Teruel.** 4 ex. Manzanera 30TXK83, 960 m, 18.viii.1997. Triassic gypsum soils, (CVC). 3 ex Navarrete del Río: 30TXL43, 910 m, 18.ix.2007, Alziar leg (Coll Alziar). **Valencia.** 13 ♂♂, 6 ♀♀, 4 ex Alborache 30SXJ96, 310 m (CVC); 3 ♂♂ 2 ♀♀, Chiva 30SXJ88, in *O. tridentata angustifolia* on Triassic gypsum soils, 7.viii.1998, (CVC); 4 ♂♂, 5 ♀♀ same data except 2.viii.1997 (CVC); 1 ♂ 1 ♀, 8.vii.1990 (CVC); 2 ex. Quesa: 30SXJ 93, 600 m, 15-vii-91, (CVC); 3 ex same data except 9.viii.1993 (CVC). **Zaragoza.** 8 ex. between Calatayud and Monebrega 30TXL06, 720 m, 17.ix.2007, Alziar leg. (Coll CVC).



Figure 6. Spiculum gastrale. a. *dumeei*; b. *alonsochrysomimus*. Bar = 0.1 mm. **Figure 7.** Preimaginal states 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*.

7a



7b



7c



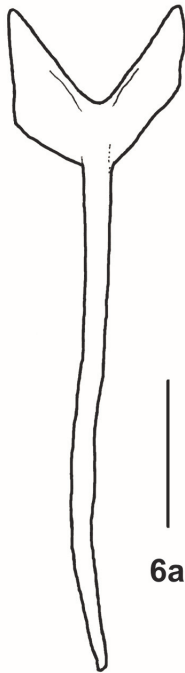
7d



7e



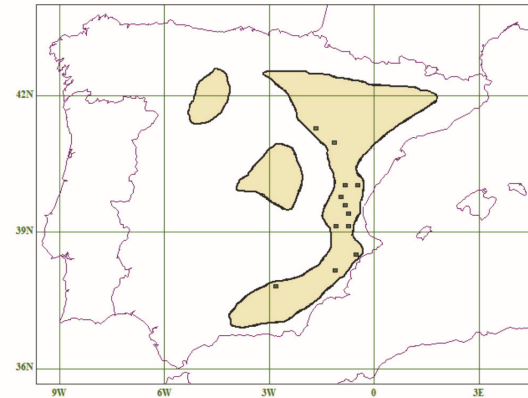
6a



6b

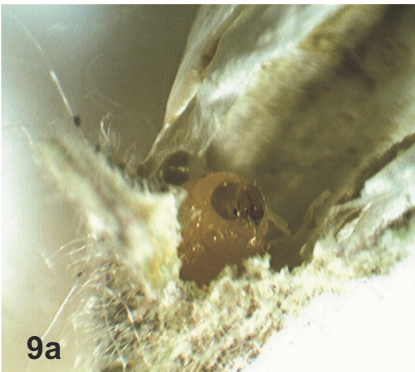


Pseudoprotapion



8

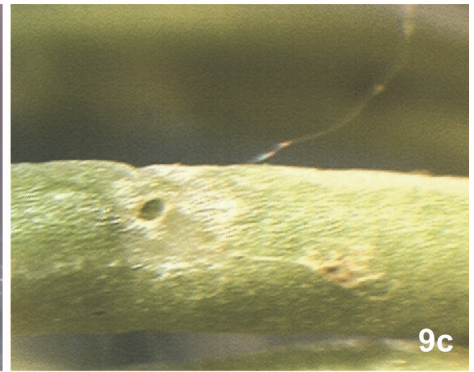
9a



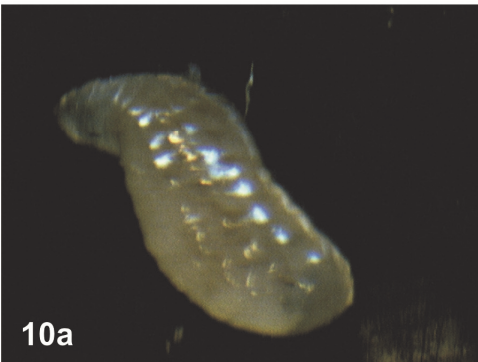
9b



9c



10a



10b



10c



11



Pseudoprotapion dumei (Hoffmann, 1957) *stat. prom.*

Fig. 2b.

Apion astragali dumei 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 bluish 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; prorostrum 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 feeble longitudinal confluence on metarostrum (even punctate grooves on lateral sides are usually more weakly developed than is usual in the genus), smallest apically on prorostrum but present up to apex; microsculpture fine and scratchy on metarostrum, particularly basally, weaker to absent on prorostrum, 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, prorostrum 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); scape length 0.15-0.18 (0.17). Female: club length 0.21-0.24 (0.23); width 0.09-0.10 (0.09); scape 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 metallic blue-green glints, particularly on scape, base of scape sometimes obscurely lighter; scape elongate, weakly clubbed apically, more or less equal in length to mesorostral width in male, slightly longer in female; 1st funicular article circa x2 longer than wide, as broad as or slightly broader than apical width of scape, articles 2-5 diminishingly elongate, only weakly swollen apically, appearing rather moniliform, articles 6-7 slightly broader; club elongate, particularly in one aspect, tapering to acute apex; antennal setae very fine, indistinct.

Head: male: length 0.36-0.42 (0.40); width 0.37-0.43 (0.40); eye length 0.21-0.27 (0.26). Female: length 0.37-0.43 (0.41); width 0.38-0.43 (0.40); eye length 0.23-0.28 (0.26).

As broad as long, widening variously from posterior margin of eyes or from behind punctate temples to greatest width basad at front margin of pronotum, often giving the

head a slightly squeezed or bulbous appearance, width at base equal to or greater than width across eyes; eyes large, convex, anterior angle to midline c.70°, oval in lateral view; frons equal in width to metarostrum (female) or slightly narrower (male), clearly quadristriate, impunctate or with few scattered punctures, then mostly laterally around eyes, microsculpture rougher in male, often smooth and shiny in female; vertex narrow, sparsely to moderately punctate against generally smooth background, posterior margin variously flat to weakly raised; temples around rear margin of eyes confusedly uni- to biserially punctate, limited postero-ventrally in more (female) or less (male, sometimes even absent) developed backward-pointing denticle (in lateral view); transverse striation of neck region extremely fine and shallow, smooth and shiniest part of head.

Pronotum: male: length 0.52-0.64 (0.57); width at apex 0.45-0.54 (0.51); width at base (=maximum width) 0.60-0.74 (0.69). Female: length 0.56-0.70 (0.61); width at apex 0.49-0.56 (0.52); width at base (=maximum width) 0.64-0.76 (0.70). Wider than long, more or less campanulate; widest at base which is weakly to distinctly flared, lateral margins thence more or less parallel to distinctly bulging for 2/3rd length (widest forward of midline, sometimes equalling but not exceeding basal flared width), then abruptly constricted into distinctive, relatively elongate collar, apical margins laterally often appearing thickened and inrolled (the overall effect is rather 'turtle-necked'); base weakly bowed (almost straight) to weakly biarcuate; prescutellar fovea distinct, linear, deep, reaching at least to centre, usually clearly beyond; punctation strong and dense, separated mostly by less than half their diameter, irregularly round or angular to more or less horizontally oval, with broad relatively impunctate sub-basal region, similar smaller areas on disc and apical margin of collar; interstices flat to feebly swollen, smooth to very finely and ephemerally etched with microreticulation, usually most distinct basally, overall effect very shiny, blue-green; setae very small and fine, pale yellow, barely overreaching margins of originating puncture.

Scutellum: small, elongate-oval, smooth to more frequently grooved and/or reticulate.

Elytra: male: length 1.64-1.96 (1.84); width at base 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). Elongate-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; stria punctures small, numerous (separated by 1-1.5 their diameter), entirely contained within stria margins; interstriae broad (at least twice stria width), sub-flat to weakly raised, extensively marked with fine transverse scratches, grooves and pleats which seldom traverse the whole interstria width and give the surface a silky sheen in contrast to the more metallic pronotum and head; interstria punctures minute numerous, irregularly uni- 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 Palearctic *Pseudoprotapion* 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. alonsochrysomimus*, 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 prostegium 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); brl/rl 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: mpw/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/pl 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); brl/rl 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: mpw/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/msrw 1.06-1.44 (1.28); ptbl/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. dumei*.

SPECIMENS EXAMINED: SPAIN: 1♀, Escorial (Madrid), 30.vi.1925 (MNCN); 1m 1f, San Rafael (Segovia), 15.vi.1929 (MNCN); 2♂♂ 1♀, Valsain (Segovia), 15.ix.1931 (MNCN). PORTUGAL: Algarve: 5♂♂ 2♀♀, 1km E Parises, 3.v.2003; 17♂♂ 15♀♀, same locality, 27.iv.2004; 7♂♂ 3♀♀, same locality, 5.v.2006, all ex. in *Astragalus lusitanicus* (colls. P.J.H & MGM).

Pseudoprotapion tricarinatum (Waltl, 1835) *stat. res.*

Fig. 2c.

Apton 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 metarostrum 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; metarostrum 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; prorostrum more or less cylindrical, in some specimens very feebly enlarged apically; punctation on metarostrum few, shallow, aligned dorsally, often indistinct against more or less strong background microreticulation which extends from the base onto the proximal part of the prorostrum, punctation on prorostrum 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 0.14-0.15 (0.15); at metarostrum 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 metarostrum 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.

Antennae: 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 isodiametric, 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 base of scape, club sometimes browner.

Female: club length 0.18-0.21 (0.20); width 0.08-0.10 (0.09); scape length 0.10. Slenderer, with funicular articles more narrowly articulated, particularly noticeable on proximal articles; scape apically less roundly clubbed; 1st funicular article more than 1.5x longer than wide, 6th and 7th articles comparatively broader; club slightly more elongate (care should be taken to compare widest angle as club is somewhat flattened).

Head: male: length 0.32-0.37 (0.34); width 0.32-0.36 (0.33); eye length 0.19-0.25 (0.21). Female: length 0.34-0.37 (0.36); width 0.34-0.35 (0.34); eye length 0.21. As broad as long, widest at base, narrowed conically to posterior margin of temples which are more or less swollen behind eyes, swelling lateral outline in dorsal view; eyes large, round in profile view, oval in dorsal view, outline smoothly curved and moderately prominent; frons narrower than base of rostrum, more or less flat in females, rather convex in males, distinctly tri- or quadricarinate, carinae tending to dislocate and bifurcate, particularly laterally, few scattered punctures present among carinae, more so postero-laterally, surface anteriorly finely microreticulate, posteriorly smoother although sometimes difficult to quantify due to corrugated effect of carinae and punctures; vertex irregularly punctate, punctures mostly shallow and separated by more than their own diameter although on some specimens tending to cluster irregularly, surface shiny to finely microreticulate, rear margin sharply demarcated by a variably developed constriction of the head, giving both frons and vertex a raised appearance and the neck a more or less weakly strangulated appearance; neck smooth and shiny, in lateral view bifurcate gular tooth variably but always noticeably reduced by comparison with *P. elegantulum*.

Pronotum: male: length 0.46-0.52 (0.49); width at apex 0.42-0.46 (0.43); at base (= maximum width) 0.52-0.61 (0.55). Female: length 0.42-0.54 (0.50); width at apex 0.40-

0.43 (0.42); at base 0.53-0.58 (0.55); maximum width 0.54-0.58 (0.56). Wider than long; base weakly bowed to almost straight, male lateral margins more or less perpendicular for basal half length to very weakly enlarged around midpoint (the more developed this feature the more the basal angles tend to be flared to approximately the same width), in females perpendicular for approximately basal third and more distinctly enlarged at midpoint, in both sexes narrowed from widest point to anterior margin in more or less straight line, when swerved this is usually quite weak and consequently any anterior 'collar' is very feeble; anterior margin not raised; prescutellar fovea narrow, sharply-defined, reaching almost to anterior margin, in some specimens tending to fragment or disintegrate in anterior third; punctuation strong, more or less crowded 2-4 deep each side of median fovea, laterally a little less dense, more noticeably so in males examined, punctures close-set in bands, these separated by less than half diameter, latero-basal areas variably less punctate; microreticulation barely visible though surface can appear rough due to pitting and corroding of puncture margins; setae very fine and small, hardly overlapping margin of originating puncture.

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 subhumeral, 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 excurved; stria punctures small, numerous, separated by approximately twice their diameter and set entirely within stria so as not to affect margins; interstriae flat to weakly convex, very finely transversely scratched and even weakly pleated, giving the surface a finely roughened, 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 punctation fine and scattered, often indistinct against extremely fine background reticulation, setae minute, pale, indistinct; mesotibiae widening gradually from basal region without any abrupt increase apically, apical setal comb short and fine but distinct; metatibiae very similar to mesotibiae, only feebly enlarged apically, apex bluntly rounded, apical setal comb more developed compared to other tibiae, all setae on apical half also comparatively more developed; protarsi longer (1.14), 1st tarsomere at least twice as long as wide, conically enlarged to truncate apex, 2nd equilaterally triangular though appearing longer due to broadness of basal articulatory 'shoulders', sides straight, apex weakly concave, lobes of 3rd small, elongate oval, onychium extended beyond lobes by approximately half its length, claws small, acutely hooked and with large 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 all 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); msrw/mtrw 1.13-1.15 (1.14); msrw/arw 1.36-1.50 (1.44); msrw/minrw 1.45-1.55 (1.49); msrw/eyl 0.72-0.84 (0.79); brl/eyl 0.92-1.16 (1.07); antenna: scl/msrw 0.67-0.80 (0.73); acl/acw 2.10-2.11 (2.11); pronotum: pl/mpw 0.85-0.91 (0.88); mpw/hw 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/pl 1.43-1.53 (1.49); ptbl/ptbmw 6.82-9.00 (7.63); ptsl/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); msrw/mtrw 1.07-1.08 (1.07); msrw/arw 1.25-1.36 (1.30); msrw/minrw 1.27-1.50 (1.38); msrw/eyl 0.67-0.71 (0.70); brl/eyl 0.90-1.00 (0.97); antenna: acl/acw 2.10-2.25 (2.19); scl/msrw 0.67-0.71 (0.68); pronotum: pl/mpw 0.78-0.98 (0.89); mpw/hw 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); mew/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/pl 1.33-1.67 (1.48); ptbl/ptbmw 7.00-7.78 (7.33); ptsl/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 very different to that of some species of *Pseudoprotapion* that

are xerothermic: *P. ergenense*, *P. alonsochrysomimus* and *P. dumei*.

SPECIMENS EXAMINED: SPAIN: 1♂, San Juan de la Peña (Huesca), 23.vi.1972 (MGM); 1♂, same locality, 12.ix.1974 (MGM); 1♂, Linza (Huesca), 3.vii.1972 (MGM); 1♂, Adradas (Soria), 25.vii.1997, leg. LA (MNCN); 1♂ 3♀♀, Muriel de la Fuente 1025 m (Soria), 23.vii.2012, leg. J.I. Pascual (AVC & MIR colls.).

COMMENTS: *Stat. res.* from synonymy under *P. elegantulum* (Germar, 1818)

Pseudoprotapion astragali (Paykull, 1800)

Fig. 2d.

Attelabus astragali G.de Paykull, 1800

Apion saeculare M.des Gozis, 1881

DESCRIPTION

Size and colour: Male: 2.06-2.40 mm (2.29, 19 specimens). Female: 2.28-2.48mm (2.38, 18 specimens). Bright metallic green or blue, including legs and rostrum, though both these last may appear much darker, almost black with metallic gleams only at certain angles; tarsi 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 metarostrum 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; metarostrum 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 metarostrum (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 metarostrum 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 metarostrum.

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 metarostrum 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, coppery (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 1/2 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 antennal 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, microsurface 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 strangulated 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.

Pronotum: 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-scutellar 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, sutural stria not reaching scutellum, sometimes by as much as the length of the scutellum, 3rd stria basally more or less excurved, stria 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/hl 0.59-0.73 (0.65); rostrum: rl/pl 1.28-1.48 (1.36); rl/msrw 4.00-4.67 (4.46); brl/rl 0.31-0.35 (0.33); msrw/mtrw 1.07-1.21 (1.11); msrw/arw 1.25-1.55 (1.34); msrw/minrw 1.25-1.55 (1.38); msrw/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: mpw/hw 1.51-1.78 (1.61); bpw/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: pft/msrw 1.19-1.33 (1.26); ptbl/pl 1.40-1.53 (1.49); ptbl/ptbmw 6.64-8.33 (7.14); ptbl/ptbl 0.55-0.63 (0.59); ptbl/rl 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/hl 0.58-0.66 (0.63); rostrum: rl/pl 1.43-1.69 (1.58); rl/msrw 5.13-6.15 (5.75); brl/rl 0.27-0.31 (0.29); msrw/mtrw 1.07-1.15 (1.08); msrw/arw 1.18-1.27 (1.25); msrw/minrw 1.25-1.50 (1.36); msrw/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); mpw/hw 1.50-1.70 (1.64); bpw/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: pft/msrw 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/rl 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, Turkey and Syria. 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. monspessulanus* L., *A. sempervirens* Lam. and *A. vesicarius* L. as host plants, but he included the good species *Pseudoprotapion ergenense* (Becker, 1864) as a variety of *P. astragali*, thus confusing the host plants of both species. For now the suspicion must remain 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.

SPECIMENS EXAMINED: FRANCE: 1♂, 2 km N. Joncheres (Drôme), 11.vi.1979 (MIR). ITALY: 1♂, Santa Severa (Ro-

ma), 25.v.1986 (MIR); 1♀, Cugno Acero 1450 m, Mass. Pollino (Potenza), 21.vi.1988 (MIR); 1♀, Duglia 1400 m, Mass. Pollino (Potenza), 23.vi.1988 (MIR); 6♂♂ 4♀♀, pende SE Monte Antola, 1200 m (Genova), 18.vii.1985 (CG); 1♂ 2♀♀, Badolato (Calabria), 11.viii.1975 (leg. Pace, coll. CG); 2♀♀, Pescopennataro, 1400 m, (Isernia), 14.vi.2010 (CG). SLOVA-KIA: 1♂, Kalonda 300 m, Cerova vrchovina (Zapadoslovensky), 28. viii.1981, leg. MK (MIR). UK: 1♂ 1♀, Bedford Purlieu nr. Wansford (Northamptonshire), 31.vii.1985, leg. PH, ex *Astra-galus glycyphyllos* (L.) (MIR); 5♂♂ 4♀♀, Bedford Purlieu, 2.viii.1987, ex *A. glycyphyllos* (L.) (MIR); 2♂♂ 3♀♀, Sundon Quarry (Bedfordshire), 6.vii.1989 ex *A. glycyphyllos* (L.) (MIR).

Pseudoprotapion elegantulum (Germar, 1818)

Fig. 2e.

Apion elegantulum Germar, 1818.

DESCRIPTION

Size: male: 2.25-2.58 (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*).

Female: similar to male, distinctly longer, proportionally thinner; metarostrum longer with microreticulation not extending beyond proximal half of mesorostrum (rest of rostrum smooth and glossy); mesorostral swelling variable from slight to quite strong but always distinct; prorostrum cylindrical, sometimes very slightly thinner towards distal end of proximal half; punctuation fine on metarostrum, very fine on prorostrum, barely visible apically even under higher magnification.

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, most 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, isodiametric; 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 articles, 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 metarostrium, very variably 3-5 carinate, from reduced and partially effaced against a relatively smooth background, to strongly carinate against a more sculptured background, the carinae often tending 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; punctation 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 subhumeral 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 stria 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 excurved; 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, punctation along length of protibia 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 isodiametric; 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/rl 0.28-0.31 (0.30); msrw/mtrw 1.13-1.19 (1.14); msrw/arw 1.27-1.58 (1.46); msrw/minrw 1.40-1.58 (1.48); msrw/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: mpw/hw 1.57-1.77 (1.66); bpw/apw 1.22-1.33 (1.29); pl/mpw 0.83-0.96 (0.90); elytra: mew/mpw 1.81-1.96 (1.88); el/pl 3.02-3.27 (3.16); el/mew 1.45-1.55 (1.50); mew/bew 1.25-1.33 (1.29); bew/mpw 1.42-1.50 (1.46); foreleg: pft/msrw 1.17-1.25 (1.21); ptbl/pl 1.49-1.61 (1.53); ptbl/ptbmw 7.45-8.56 (7.87); ptsl/ptbl 0.52-0.59 (0.55); ptbl/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); msrw/mtrw 1.07-1.23 (1.14); msrw/arw 1.25-1.50 (1.35); msrw/minrw 1.25-1.60 (1.43); msrw/eyl 0.68-0.79 (0.75); brl/eyl 0.95-1.28 (1.12); antenna: acl/acw

2.10-2.38 (2.26); scl/msrw 0.73-0.93 (0.82); pronotum: mpw/hw 1.58-1.82 (1.69); bpw/apw 1.21-1.33 (1.26); pl/mpw 0.81-0.92 (0.87); elytra: mew/mpw 1.77-1.94 (1.86); el/pl 2.89-3.32 (3.13); el/mew 1.38-1.64 (1.46); mew/bew 1.26-1.36 (1.31); bew/mpw 1.37-1.46 (1.42); foreleg: pft/msrw 1.20-1.33 (1.27); ptbl/pl 1.37-1.60 (1.48); ptbl/ptbmw 6.25-7.78 (7.07); ptsl/ptbl 0.52-0.58 (0.55); ptbl/rl 0.90-1.03 (0.95); el/ptbl 2.05-2.30 (2.12).

DISTRIBUTION: Europe (not in the north), Asia till Kazakhstan and Siberia. Unconfirmed record also from Algeria.

BIOLOGY: The host plant is *Onobrychis viciifolia* (Dieckmann 1977). The development of the larva is unknown. The imagoes appear from May to October after Dieckmann (1977).

SPECIMENS EXAMINED: FRANCE: 1♀, Digne (Basses Alpes), 13.vii.1977 (MIR); 1♀, 3 km N les Echelles (Savoie), 8.vi.1979 (MIR); 1♂, Col St.Louis 680 m (Aude), 17.v.1992 (MIR). HUNGARY: 1♀, Kaza'r 300m. (Nograd), 7.vii.1982, lgt. MK (MIR). ITALY: 1♂ 1♀, Barisciano (L'Aquila), 28.v.1986; 4♂♂ 7♀♀, 4 km E. Borbona (Rieti), 12.vii.1990 (MIR); 1♀, Verrico, 8 km N Montereale (L'Aquila), 12.vii.1990; 1♂, Pourrieres, Valle Chisone, 1420m. (Torino), 30.v.2000, lgt. F.Angelini (CG). SLOVAKIA: Belina 300 m, Cerova vrchovina (Zapadoslovensky), 6.viii.1981, leg. MK (MIR). TURKEY: 1♂ 1♀, env. E Tekebeli Geçidi, 1200 m (Ankara), 2.vi.2002 (CG); 2f, 20 km NE Çubuk, Camilibeli Geçidi, 1200 m. (Ankara), 8.vi.2002.

Key to described species

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 rostrum markedly elongate (protibial length ♂♂ 0.8-1 mm, ♀♀ 0.84-1.05) *dumeei*
– Smaller species (♂♂ 2.1-2.5 mm, ♀♀ 2.3-2.7 mm), legs shorter (protibial length; ♂♂ 0.66-0.85, ♀♀ 0.7-0.87 mm) 3
3. Antennae setose, last three articles of funiculus with semi-erect setae exceeding length of originating article; club at most twice as long as wide, densely setose
..... *alonsochrysomimus*
– Antennal setae fine, short, not outstanding; antennal club elongate (club length/width 2.25-2.65), setae not distinct *astragali*
4. Gular tooth prominent *elegantulum*
– Gular tooth small *tricarinatum*

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