

# Cynipid wasps inducing galls on plants of the genus *Picris* (Asteraceae) in Europe, with a description of a new species of *Phanacis* Foerster (Hymenoptera: Cynipidae) from the Iberian Peninsula

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**Abstract.** The cynipid species (Hymenoptera: Cynipidae), inducing galls on plants of the genus *Picris* (Asteraceae) in Europe, are revised. A key for the identification of adult wasps and galls of the three known species is provided. *Phanacis helminthiae* (De Stefani) is recorded from Sicily for the first time since its description, and re-described with newly collected materials. The final instar larva of *Phanacis caulicola* is described and new biological data on the sex ratio and life-cycle of this species are given. A new species, *Phanacis comosae* **nov. sp.**, is described from the Southwest portion of the Iberian Peninsula. The new species is closely allied to *P. caulicola* and induces conspicuous galls in flower receptacles of *Picris comosa*.

**Résumé.** Les cynipides qui induisent des galles sur les plantes du genre *Picris* (Asteraceae), avec la description d'une nouvelle espèce de *Phanacis* Foerster (Hymenoptera : Cynipidae) de la Péninsule Ibérique. Les espèces de cynipides (Hymenoptera) qui induisent des galles sur les plantes du genre *Picris* (Asteraceae) en Europe sont révisées. Une clé pour l'identification des trois espèces connues est fournie pour les guêpes adultes et leurs larves. *Phanacis helminthiae* (De Stefani) est observée de Sicile pour la première fois depuis sa description. Elle est redécrite grâce à du nouveau matériel récolté. Le dernier stade larvaire de *Phanacis caulicola* est décrit et de nouvelles données biologiques sur son sex-ratio et sur son cycle de vie sont apportées. Une nouvelle espèce, *Phanacis comosae* **nov. sp.**, est décrite du sud-ouest de la Péninsule Ibérique. Cette nouvelle espèce est étroitement apparentée à *P. caulicola* et elle induit des galles dans les réceptacles floraux de *Picris comosa*.

**Keywords:** Gall wasps, larvae, Compositae, Sicily, Spain.

Cynipids of the tribe “Aylacini” (Hymenoptera: Cynipoidea: Cynipidae), also termed herb gall wasps, induce galls on herbs and shrubs of several botanical families, mainly Asteraceae, Papaveraceae, Lamiaceae and Rosaceae. The greater species richness of this group of cynipids is reported from the West Palaearctic biogeographic region, where it is hypothesized that a centre of herb gall wasp diversity arose around the Black Sea (Liljeblad & Ronquist 1998; Ronquist & Liljeblad 2001; Nieves-Aldrey 2001; Melika 2006). About 160 species of Aylacini are known worldwide, with 125 of them recorded from the Palaearctic (Liljeblad 2002). The Western European genera of Aylacini were revised by Nieves-Aldrey (1994), who also later revised all species of the Iberian Peninsula (Nieves-Aldrey 2001). A

recent revision of the gall wasp fauna of Ukraine was produced by Melika (2006). Morphological and molecular studies on the phylogeny of Cynipidae have shown that the “Aylacini”, as currently classified, is an artificial non monophyletic assemblage of different lineages (Liljeblad & Ronquist 1998; Nylander *et al.* 2004; Nylander 2004). A revision of the classification of the genera included in that tribe is necessary.

One of the more species-rich Aylacini genera is represented by the species complex *Phanacis/Timaspis*. *Timaspis* has been alternatively synonymized with *Phanacis* by Eady & Quinlan (1963), resurrected by Nieves-Aldrey (1994), and returned to synonymy again by Melika (2006). This fact reflects the taxonomical complexity of those two genera. However, a thorough revision of the species complex, including phylogenetic data, is still necessary. The group includes about 25 species, most of them distributed in the Palaearctic, especially in Europe and Central Asia (Nieves-Aldrey 2001; Liljeblad 2002; Melika 2006). More recently the first *Phanacis* species from the Afrotropical region has been described (Melika & Prinsloo 2007).

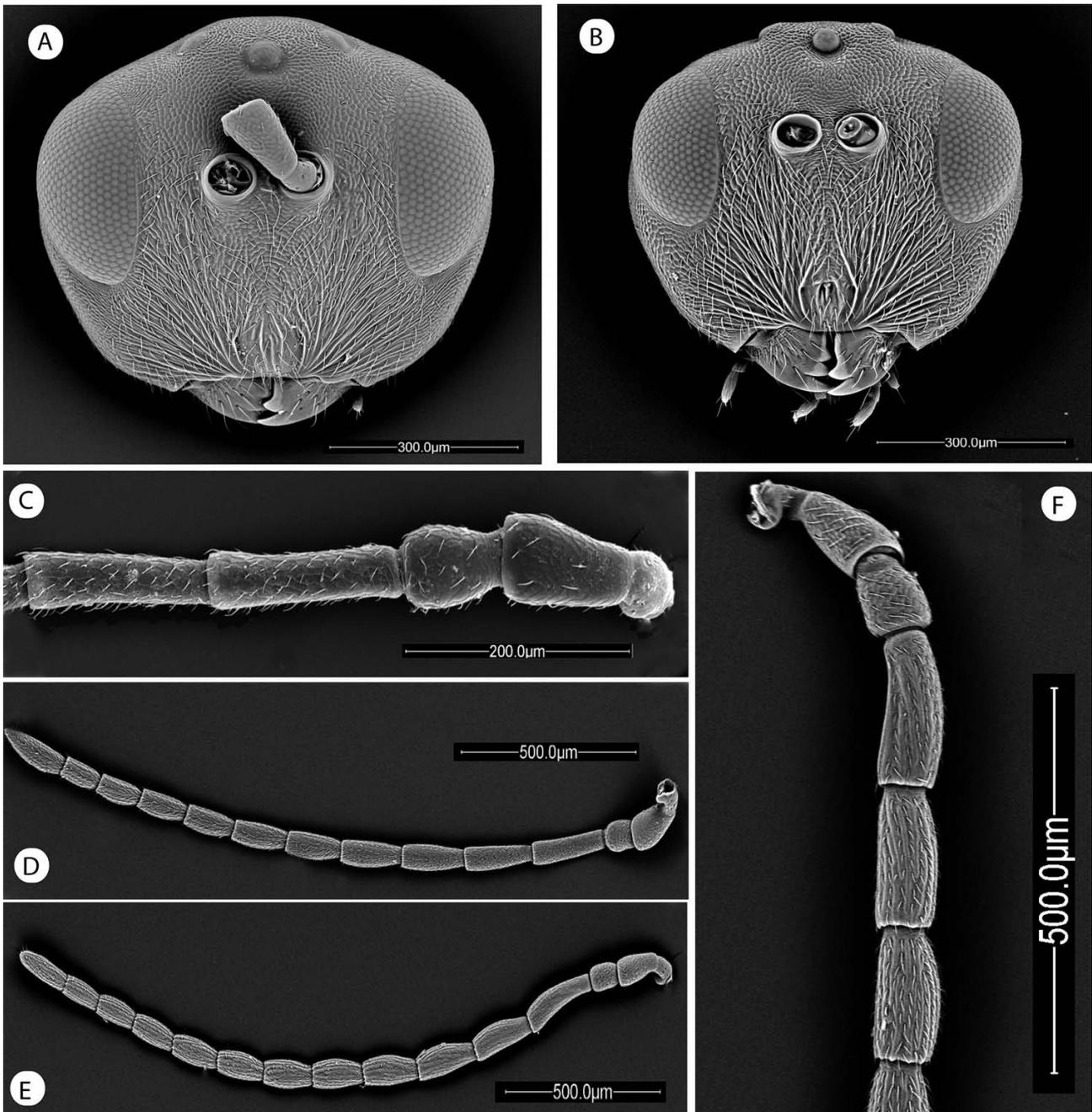
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The species of *Phanacis* predominantly induce galls on plants of the Asteraceae family, especially on species of *Centaurea*, except two species producing galls on *Phlomis* (Lamiaceae) and *Eryngium* (Apiaceae). Two species were known to be associated with plants of the genus *Picris* (or its synonymous *Helminthia*): *Phanacis*

*caulicola* (Hedicke 1939) and *Timaspis helminthiae* De Stefani, 1902. The later species was not recorded further for more than 100 years since its description. A third species *Aylax picridis* Kruch (Kruch 1891; Dalla Torre & Kieffer 1910; Pagliano 1995) was described from a gall collected on *Picridium vulgare* in Italy (a plant



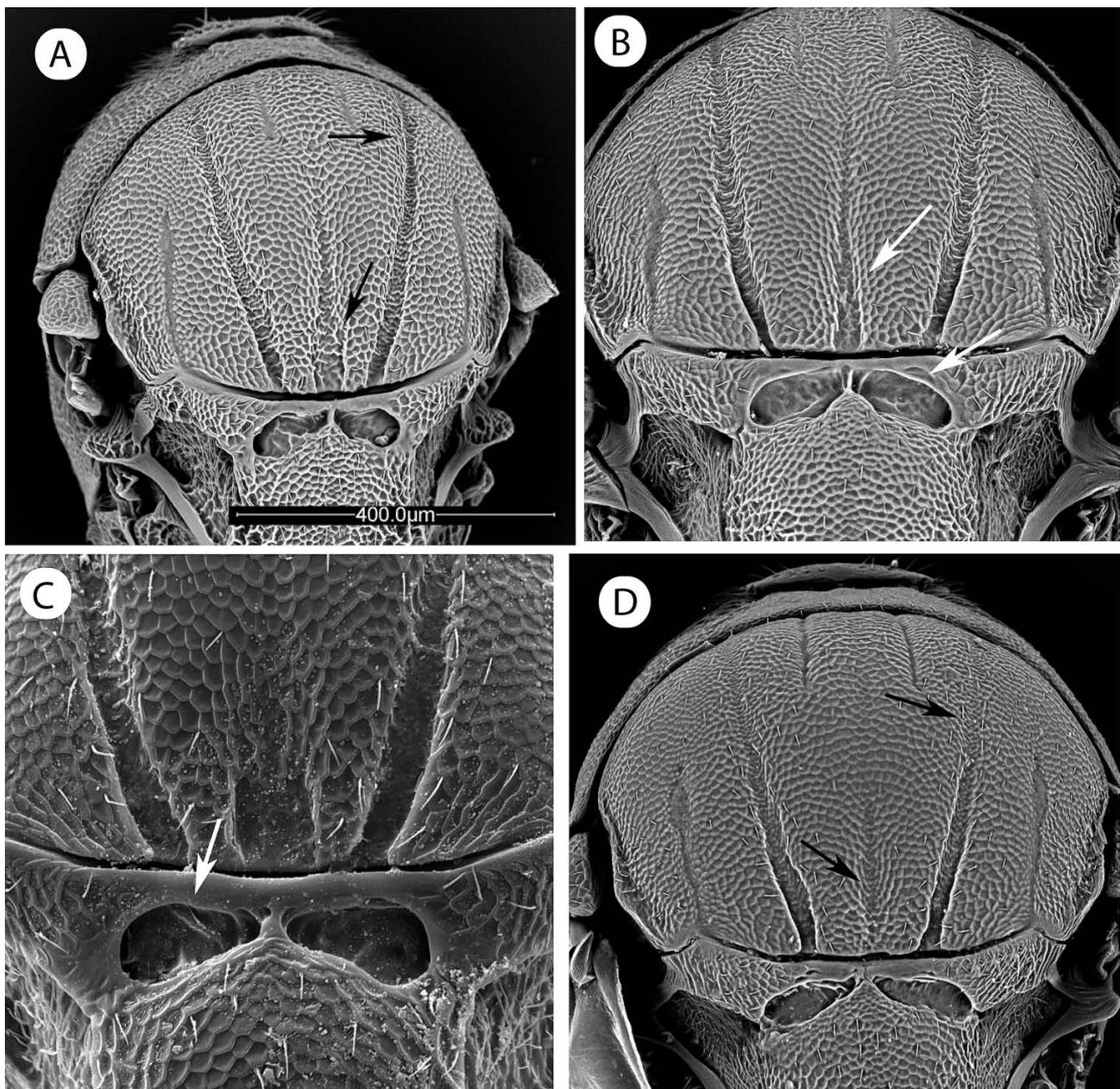
**Figure 1**  
*Phanacis* spp. gall inducers on *Picris*. (SEM). **A**, Head anterior view, female of *P. helminthiae*; **B**, Head anterior view, female of *P. caulicola*; **C**, Scape, pedicel and two first flagellomeres of female antenna of *P. caulicola*; **D**, Antenna female; **E**, antenna male of *P. helminthiae*; **F**, Detail of first antennomeres of male antenna of *P. caulicola* (ex stem galls on *Picris comosa*).

closely related to *Picris*). The gall is a stem hypertrophy and it is likely to belong to a *Phanacis* species. However, no insect material of this species could be found and it has been not included in this revision. The objective of this work is to revise the cynipids galling *Picris* species from freshly collected materials in Italy and Spain. We include the description of a new species from the southwest of the Iberian Peninsula, which induces galls

on *Picris comosa*. We aim also to provide a key for their identification, and for the first time to describe the mature larvae of this group of species.

#### Materials and Methods

Studied materials were reared from galls collected in the field in Spain and Italy. Adults emerged in rearing cages from galls under laboratory conditions. Freshly collected galls were dissected and their contents (larvae and adults) identified and



**Figure 2**  
Mesoscutum of species of *Phanacis* gall inducers on *Picris*, females (SEM). **A**, *P. caulicola* (ex galls stems *P. comosa*); **B**, *P. comosae*; **C**, *P. caulicola* (ex gall stems *P. echioides*); **D**, *P. helminthiae*.

photographed. Adult insects were dissected in 70% ethanol, air dried, mounted on a stub and coated with gold. Micrographs were taken with a scanning electron microscope FEI QUANTA 200 (high vacuum technique) for several standardized views. Forewings were mounted in Euparal on slides, and examined under a stereomicroscope. Larvae were transferred directly from absolute alcohol onto a SEM-stub and examined at a low vacuum without fixation or coating, but larval mandibles were dissected, mounted, and observed as morphological parts of adult, following protocol described in Nieves-Aldrey et al (2005). Images of forewings, adult habitus, galls, and dissected galls were taken with a Nikon digital camera attached to a Leica stereomicroscope. Terminology of the morphological structures and abbreviations follow Ronquist & Nordlander (1989), Ronquist (1995), Liljeblad (2002), & Nieves-Aldrey (2001). SEM pictures of adult and larva will be deposited in Morphbank (<http://morphbank.com>).

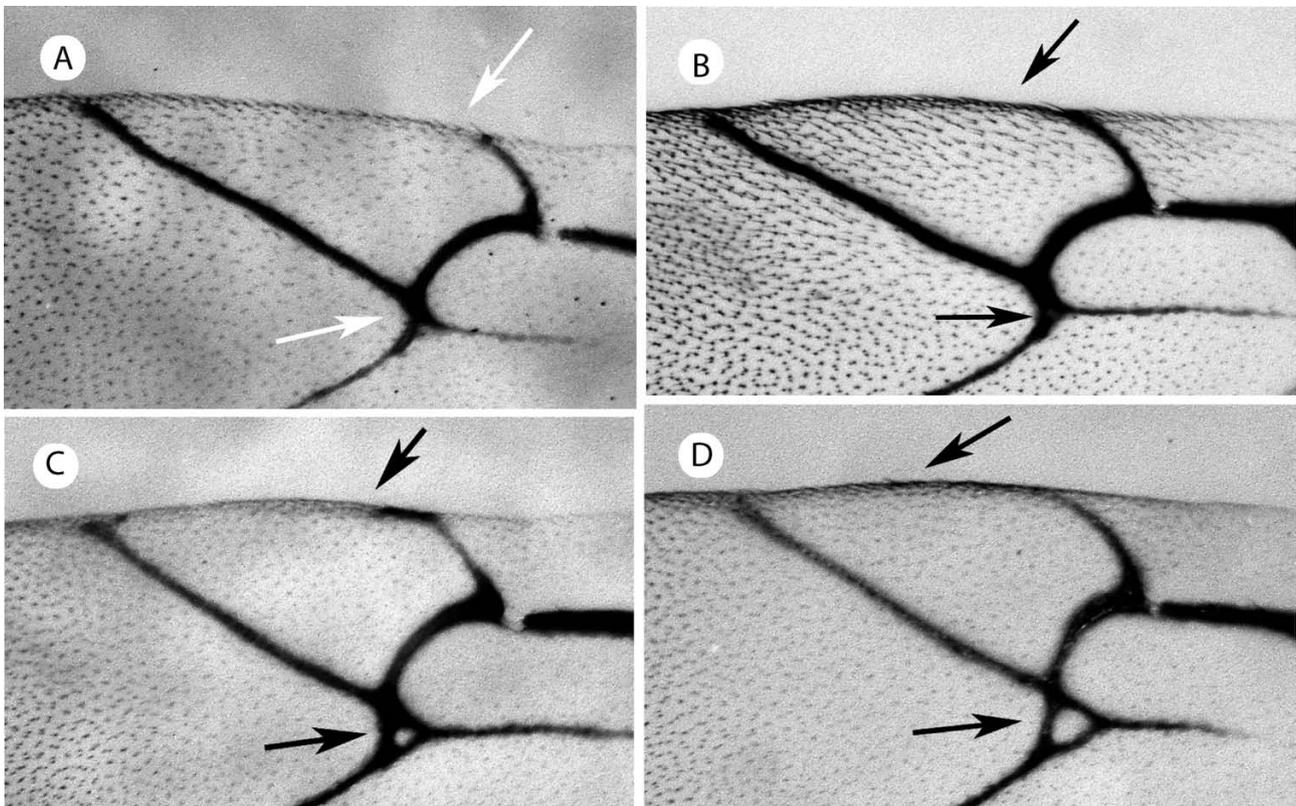
## Results

### Key to cynipid species that induce galls on plants of the genus *Picris*

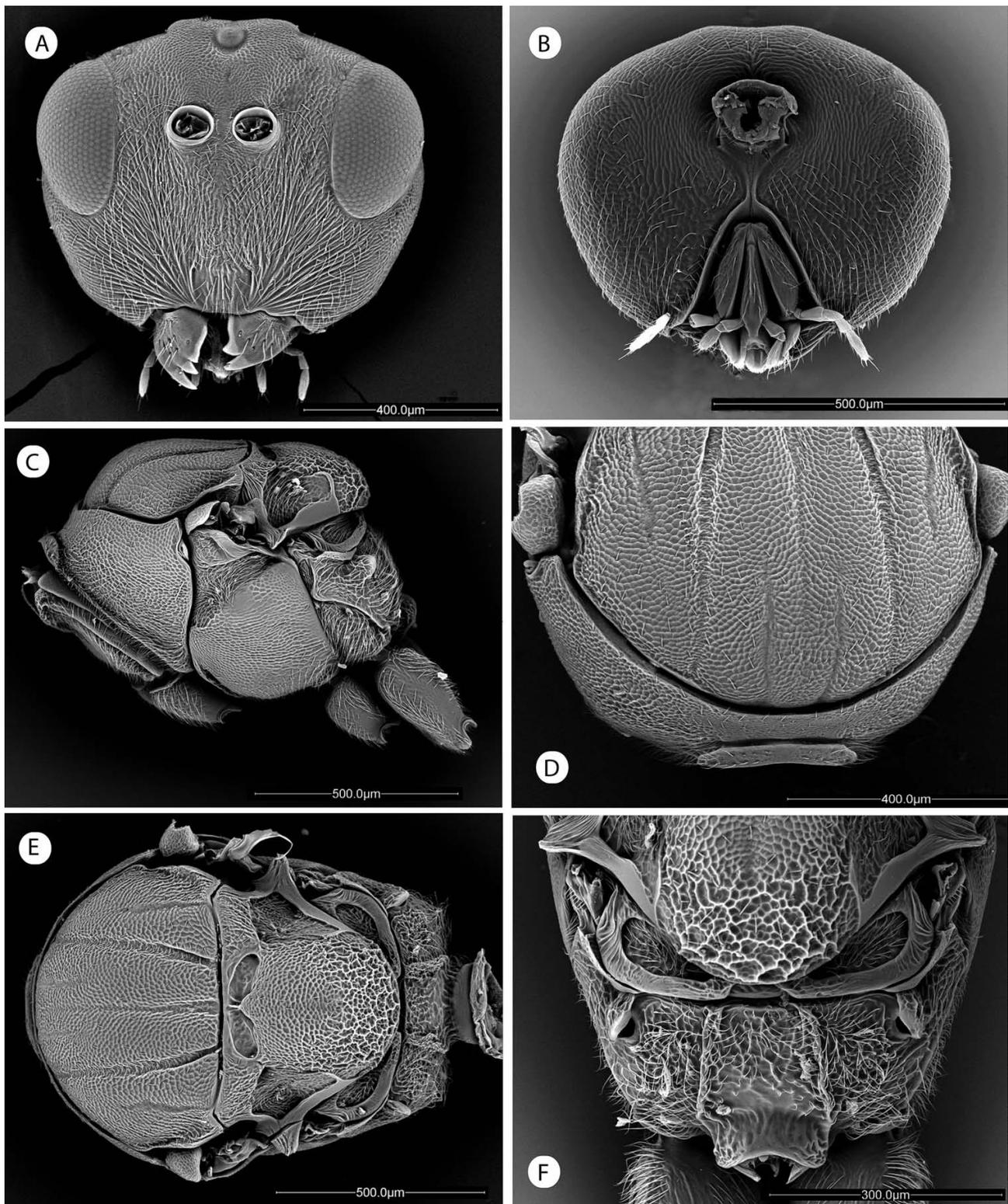
1. **A.** Head in anterior view with the ocellar triangle on vertex distinctly raised anteriorly; anterior margin

of vertex strongly bowed medially (Fig. 1A); median ocellus separated from anterior margin of vertex by a distance equal to its diameter. **B.** Compound eyes 1.4-1.6 times as long as the malar space. **C.** Distance between antennal rim and compound eye 1.2 times as long as width of antennal socket including rim (Fig. 1A). **D.** F1 of antennal female 2.6 times as long as pedicel (Fig. 1D). **E.** Median mesoscutal impression weak, narrow and shallowly impressed in posterior one third of mesoscutum. Notauli shallow anteriorly (Fig. 2D). **F.** Radial cell of forewing closed along anterior half margin of wing; R1 pigmented in basal half of anterior margin of marginal cell. Areolet distinct, large (Fig. 3D). **G.** Galls in flower heads of *Picris aculeata* (Sicily, Italy) (Figs 7A, B) ..... ***Phanacis helminthiae* (De Stefani)**

- **A.** Head in anterior view with the ocellar triangle on vertex only slightly raised anteriorly; anterior margin of vertex straight or only slightly bowed medially; median ocellus separated from anterior margin of vertex by a distance much shorter than the diameter of the median ocellus (Fig. 1B). **B.** Compound eyes about 1.1-1.3 times as long as malar space. **C.** Distance between antennal rim and compound eye 0.9-1 times as long as width of antennal socket including rim (Figs 1B, 4A). **D.** F1 of antennal female 2.2 times as long as pedicel (Figs 1C, 5C). **E.** Median mesoscutal impression wider



**Figure 3**  
Radial cell of forewing of species of *Phanacis* gall inducers on *Picris*, females. (LM). **A.** *P. caulicola* (ex gall stems *P. echinoides*; **B.** *P. caulicola* (ex galls stems *P. comosa*); **C.** *P. comosae*; **D.** *P. helminthiae*.



**Figure 4**  
*Phanacis comosae* sp. nov., (SEM). **A**, Head anterior view. **B** Head posterior view; **C**, Mesosoma lateral view; **D**, Pronotum anterior view; **E**, Mesosoma dorsal view; **F**, Propodeum.

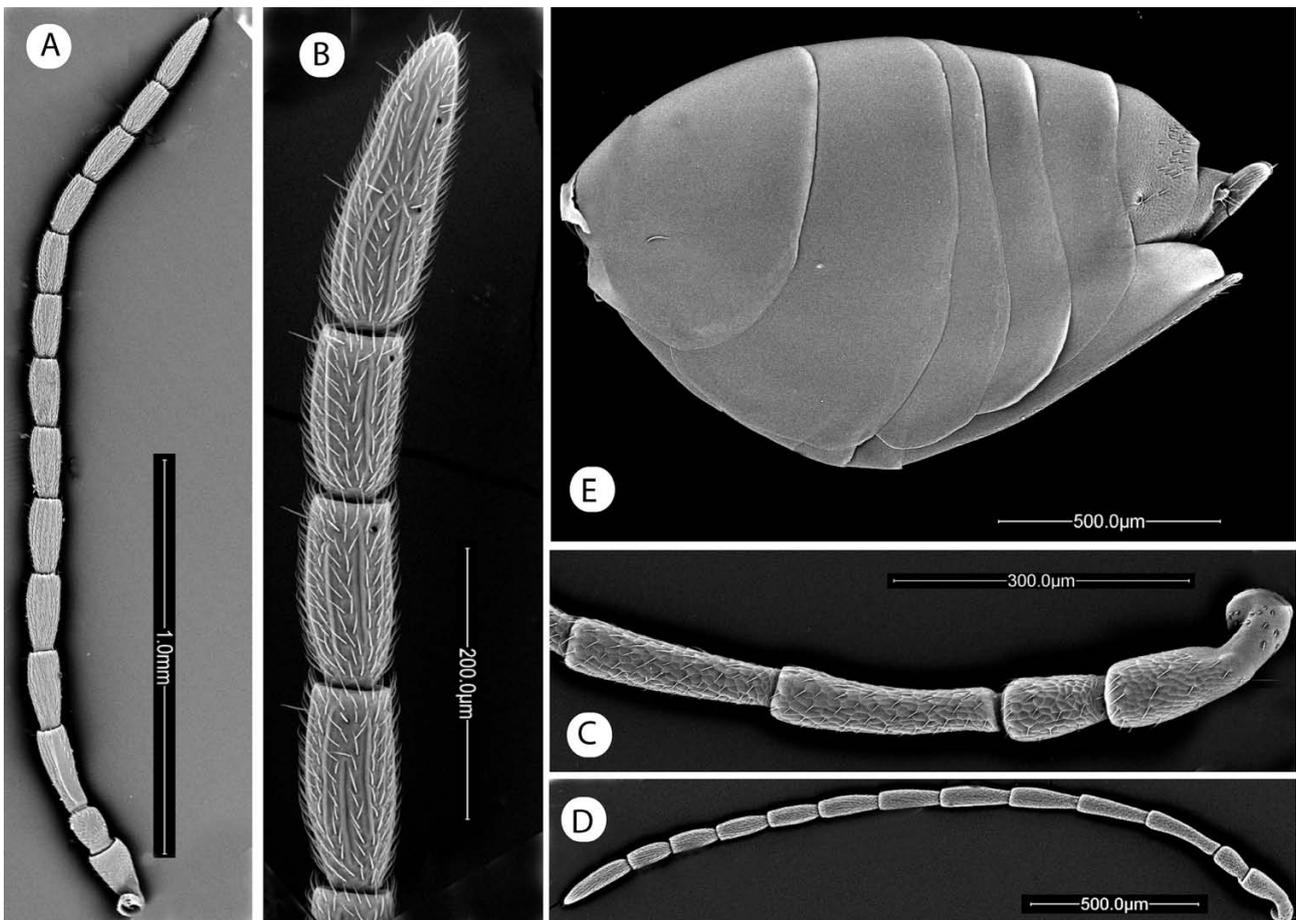
and more deeply impressed in posterior one third of mesoscutum. Notauli more deeply impressed anteriorly (Figs 2A, 2B). **F.** Radial cell of forewing open along anterior basal margin of wing or closed only in basal third; R1 pigmented only in basal third of anterior margin of radial cell or not completely pigmented along anterior margin. Areolet inconspicuous or small (Figs 3A, 3B, 3C). **G.** Gall in stems or flower heads of other species of *Picris* .....

2. **A.** Female antennal pedicel relatively short and wide; 1.1-1.3 times as long as wide; 1.3-1.6 times as wide as F1 (Fig. 1C). F11 1.6 times as long as F10. **B.** F1 of antenna of male less curved and only slightly expanded apically. **C.** Median mesoscutal impression relatively broad; at its wider part broader than the distance between the notauli and the mesoscutal impression, measured across the transscutal fissure (Fig. 2A, 2C). **D.** Scutellar foveae more or less rim shaped; their anterior margins together forming a straight line parallel to the transscutal fissure (Fig. 2C). **E.** Radial cell of forewing about 2.5 times as long as wide; R1 vein not

pigmented along anterior margin of wing; radial cell appearing open (Fig. 3A, 3B). Areolet inconspicuous.

**F.** Galls cryptic, in stems of *Picris echioides* and *Picris comosa* ..... ***Phanacis caulicola* (Hedicke)**

- A.** Female antennal pedicel relatively long and narrow; 1.6 times as long as wide; 1.1 times as wide as F1 (Fig. 5C). F11 1.8 times as long as F10 (Fig. 5B). **B.** F1 of antenna of male rather curved and clearly expanded apically (Fig. 5A). **C.** Median mesoscutal impression relatively narrow; at its wider part narrower than the distance between the notauli and the mesoscutal impression, measured across the transscutal fissure (Fig. 2B). **D.** Scutellar foveae more or less ellipsoidal; their anterior margins together forming an arc contra to the transscutal fissure (Fig. 2B). **E.** Radial cell of forewing about 2 times as long as wide; R1 vein partially pigmented along basal third anterior margin of wing; radial cell appearing partly closed (Fig. 3C). Areolet present, but small. **F.** Galls conspicuous, in flower heads of *Picris comosa* ..... ***Phanacis comosae* sp. nov.**



**Figure 5**  
*Phanacis comosae* sp. nov., (SEM). **A.** Antenna male; **B.** Last flagellomeres of female antenna; **C.** First antennomeres of female antenna; **D.** Female antenna; **E.** Metasoma female, lateral view.

***Phanacis helminthiae* (De Stefani 1902)***Timaspis helminthiae* De Stefani 1902. *Marcellia* 1: 110 (lapsus)*Timaspis helminthiae* De Stefani. Dalla Torre & Kieffer 1910. In: *Cynipidae, Das Tierreich* 24: 702*Phanacis helminthiae* (De Stefani). Pagliano 1995. In: *Hymenoptera Cynipoidea. Checklist delle specie della fauna italiana* 96: 6.

This species was first recorded by De Stefani, who found the gall on *Helminthia aculeata* (= *Picris aculeata*) in two mountain sites near Palermo (Sicily, Italy). He described the gall and included a description of the insect by Mayr, to whom he sent the reared insects (De Stefani 1902).

Both the original insect description, and the subsequent diagnosis by Kieffer (1902) and Dalla Torre & Kieffer (1910), are relatively poor, as they refer to a few morphological characters only. The species was not further recorded and we now include a complete re-description of the adults based on SEM images.

**Redescription. Habitus. female** (Fig. 8A); **male** (Fig. 8B). Body length; 2.8 mm for females (N = 6); 2.3 mm for males (N = 4). Body coloration black; antennal flagellum as well as the base of mandibles, the apices of coxae and the trochanter, the distal half of femorae and all tibiae and tarsi of legs, light brown. Metasoma distally and basally dark brown. **Head.** Head, dorsal view, about two times as wide as long and slightly wider than mesosoma; POL 1.6 times OOL, posterior ocellus separated from inner orbit of eye by about 2.5 times its diameter. Genae not expanded behind eyes. Head anterior view (Fig. 1A) 1.2 times as wide as high; lower face moderately pubescent; facial striae radiating from clypeus extended to compound eyes and laterally to the anterior margin of antennal toruli; the facial striae are absent medially above clypeus. Upper face and vertex almost bare and with minute reticulate sculpture. Ocellar plate distinctly raised; the median ocellus separated from the anterior margin of the vertex by a distance equal to its diameter. Lateral margin of gena slightly convergent towards mouth, malar space 0.6-0.7 times as long as height of a compound eye. Clypeus slightly rectangular, 1.3 times as wide as long, ventral clypeal margin entire, not projected over mandibles. Anterior tentorial pits not clearly visible, epistomal sulcus not impressed, clypeopleurostomal lines hidden by lateral clypeal striae. Medially the clypeus present three longitudinal striae, which are not prolonged anteriorly towards the median region of the face. Antennal toruli situated at mid height of compound eye; ventral margin of a torulus separated from vertex by a length equal to the distance to ventral margin of clypeus. Distance between antennal rim and compound eye 1.3 as long as width of antennal socket including rim. Occiput sparsely pubescent, with alutaceous-reticulate sculpture, without occipital carina. Distance between occipital and oral foramina 0.8 times as long as height of occipital foramen. Hypostomal sulci well impressed, joining near hypostomata. Oral foramen about 1.6 times as high as occipital foramen. **Mouthparts.** Mandibles strong, exposed; right mandible with 3 moderately acute teeth; left with 2 teeth. Maxillary stipes long; maxillary palp 5-segmented; labial palp 3-segmented. **Antennae,** female (Fig. 1D) slender, with 13 articles; flagellum not broadening apically. Elongate placodeal sensilla present on all flagellomeres except the first. Length of antennomeres as 15:11:26:24:22:21.5:17.5:19:17.5:16:15:14:23. Pedicel 1.1 times as long as wide; F1 not

curved and not expanded at apex. Placodeal sensillae long, 3-5 moderately spaced sensillae, disposed in a single row, visible in each flagellomere; pores present in four last flagellomeres. Male antenna (Fig. 1E), with 14 antennomeres; F1 distinctly curved, flattened and slightly expanded distally; placodeal sensillae present in all flagellomeres; 6-8 close spaced sensillae being visible per segment. **Mesosoma.** Pronotum, female. Length of pronotum medially (= shortest distance between dorsal and anterior margins) moderately long (high). Admedian pronotal depressions united medially, forming a transverse impression anteriorly on the pronotum. Lateral surface of pronotum with reticulate sculpture. Mesonotum. Mesoscutum 1.4 times as wide as long; with reticulate sculpture and with some scattered short setae. Median mesoscutal impression shallow in posterior one third of mesoscutum, absent anteriorly. Notauli complete, deep and relatively broad posteriorly, faint and shallow anteriorly (Fig. 2D). Anteroadmedian signa distinct. Mesoscutum and scutellum separated by a distinct transscutal suture. Scutellar foveae ellipsoidal, 0.16 times as long as scutellum, foveae smooth; their anterior and posterior margins well marked, the posterior margins widely diverging from their anterior contacting point; anterior margins forming an arc contra to the transscutal suture. Scutellum in lateral view extending posteriorly slightly past dorsellum. Dorsal surface of scutellum anteriorly and medially with marked reticulate-imbricate sculpture, rugose posteriorly; a longitudinal shallow impression is seen in anterior third of scutellum. Axillula densely pubescent. Posterodorsal and posterior margins of axillula distinct. Posterior part of axillar strip extended dorsally. Mesopleuron beneath mesopleural triangle completely reticulate sculptured. Mesopleural triangle distinctly impressed and densely pubescent. Metanotum. Metascutellum conspicuously constricted medially. Metanotal trough narrow and densely pubescent. Metapectal-propodeal complex. Lateral propodeal carinae narrow, subparallel. Lateral and median propodeal area with rugose sculpture and densely pubescent. Nucha dorsally rugose. **Legs.** Metatibia 1.15 times as long as protarsus. First metatarsomere almost as long as following metatarsomeres combined. Tarsal claws simple, without a basal lobe or tooth. **Forewing** (Fig. 3D) 0.94 times as long as body, hyaline. Radial cell 2.1 times as long as wide; R1 prolonged along anterior margin of wing, but the vein is depigmented in posterior third; first abscissa of radius (2r) curved and radius (Rs) slightly bowed, reaching anterior margin of wing. Areolet distinct. Hair fringe along apical margin of wing long. **Metasoma.** Female metasoma as long as head and mesosoma combined. Third abdominal tergum covering more than one third of metasoma, about 1.7 times as long as fourth tergum; antero-medial area of third abdominal tergum with five long setae not forming a distinct patch. Fourth to seventh terga smooth, bare, micropunctures visible only from sixth metasomal segment. Projecting part of hypopygial spine short, as long as basal height of spine; ventrally with some short hairs.

**Gall** (Figs. 7A, 7B). The floral receptacle of *Picris aculeata* is hypertrophied into an irregular globular mass. The gall size is variable, often about the size of a nut, measuring from 18 x 13 mm to 12 x 13 mm. Galls are plurilocular (polythalamous), the internal tissue is white and tough, and containing several irregularly scattered larval cells. The surface of the galls is mostly smooth with some sparse long white hairs. The galls develop in late spring, mature in July and remain on the dry plants in summer.

**Studied material.** 6♂♂, 4♀♀, ITALY, Sicily, Nature Reserve Zingaro, 24/06/2003, ex gall *Picris aculeata* Vahl Rocco La Duca leg; 2♂, 2♀, same data but gall collected 29/03/2003, M.C.Rizzo and D.Askew leg

**Remarks.** This species is closely allied to the other two species associated with the *Picris* species examined here. However the shape of the head, the antennal conformation, and the almost closed radial cell of the wing, as outlined in the identification key provided, allow clear differentiation between *P. helminthiae*, *P. caulicola* and *P. comosae* sp. nov.

Although previously described within *Timaspis*, after the recently synonymization of this genus with *Phanacis* (Melika 2006), the species is now transferred to the genus *Phanacis*.

**Life cycle.** A typical single brooded sexual generation; the insects emerge from the galls in the spring of the second year, when new host plants are available. The sex ratio is even.

**Distribution.** Recorded only from Sicily (Italy).

### *Phanacis caulicola* (Hedicke 1939)

*Aylax caulicola* Hedicke 1939. In: Niblett, Proc. R. Entomol. Soc. London (B) 8(3): 46

*Phanacis caulicola* is the best known cynipid species that induces galls on *Picris*. The species was described by Hedicke and extensive additional descriptive data were given later by Nieves-Aldrey 2001. The species, here revised by the characters indicated in the identification key provided, is readily distinguished from the other species associated with *Picris*. Habitus female (Fig. 8C).

**Biology.** Induces cryptic galls in stems of *Picris echinoides* L. (= *Helminthia echinoides*; Asteraceae; figs 7C, 7G). As in the case of *Phanacis centaureae*, and other *Aylacini*, the galls consist of small larval cells (2.5 mm diameter), of ellipsoidal form inside of stems. There is not stem hypertrophy, and galls are not externally detected. Stems containing galls have a thickness of 5 to 10 mm and a hispid surface. Descriptive details of galls and larva, as well as notes on the ecology of the host plant, have been detailed by Bowdrey (1992). Galls mature in summer and the insects emerge at the end of spring of the next year. The lifecycle is univoltine. The male of this species remained unknown since the species description, but recently Jennings (2004) recorded males, provided information about the morphology of the adult insect and provided biological information on the sex ratio of this species. He reported that the males were extremely rare or absent in most populations of this species (males accounted for about 1.3 % of total individuals in England and 0.8% in France). As is the case for the main European populations of this species,

the reproduction of this species is by thelitokous parthenogenesis.

**Distribution.** The species was described from materials collected in England by Niblett (1939). Later the species was recorded in Poland (Kierych 1979), Spain (Nieves-Aldrey 1988, 2001), and France (Askew in Jennings 2004).

### Description of a bisexual population of *Phanacis caulicola* on *Picris comosa* and of the terminal larva

From cryptic galls in stems of *Picris comosa* collected in southern Spain, we reared a series of individuals which we also identified as *P. caulicola*. This finding represents the first record of *P. caulicola* on a plant other than *Picris echinoides*. In contrast to the populations of *P. caulicola* on *Picris echinoides*, which reproduce by thelitokous parthenogenesis, the *P. caulicola* reared from *Picris comosa* appears to have a normal sexual generation, the males being as common as the females.

**Studied material.** 27 males, 6 females, ex stems *Picris comosa*, Spain, Jerez de la Frontera, Las Aguilillas, 18/II/2005; III/05, I. Sánchez leg

### Terminal instar larva (Figs. 6A, 6C-H).

**Material examined:** Spain, Guadalajara, Valdenoches, 31/07/2001 ex galls in stems of *Picris echinoides*, J.L. Nieves leg (n = 15)

**Description.** **Length** 1.63 mm (range 1.33-2; n = 10). **Body** in ventral view sub-rectangular (Fig. 6A), weakly and gradually tapering towards the posterior end; relatively straight and not curved ventrally. Integument whitish and smooth, with a few short setae concentrated in the head region and the first thoracic segment. Body composed of head and 13 segments. First segment, in ventral view divided into two parts, one dorsal and other ventral, separated by a constriction or a suture; anterior and posterior margins of ventral part of this first body segment almost touching at the ventral-most point; segments 6-11 of similar length but progressively narrower; last segment truncate at apex and wider than long. **Head** (Fig. 6C) more or less rounded, broader dorsally; medial area of vertex convex. Antennal areas and antennae invisible. Antennal setae absent. A pair of very short and inconspicuous genal setae present. **Mouthparts.** Clypeus (Fig. 6D) well marked with its ventral margin straight and clearly prolonged ventrally into a sub-rectangular piece above the labrum; pair of supraclypeal setae present. Labrum more or less semicircular with regularly curved sides. Pair of ventro-lateral setae of labrum situated clearly above medioapical pair. Maxillae triangular with its apex pointed and with a pair of conspicuous maxillary palps. Maxillary setae present but inconspicuous. Labium small and concavous, usually collapsed. Salivary opening rounded and situated under a funnel-shaped depression; surrounding salivary opening is a tuberculate area not clearly visible, extended upwards above the salivary opening but ventrally extended in a wide band reaching ventral margin of labium and not extending into its lateral areas. **Mandibles** (Figs 6E-H) slightly asymmetrical,

without sculpture or hairs and hidden beneath labrum. Right mandible, with two teeth, a large apical acute tooth, and one secondary smaller, slightly shorter than the apical tooth; basally to second tooth present a large blunt projection, more evident in posterior view of mandible, which could be considered as a third tooth. This projection is more pronounced and acute on the left mandible which appears as a clear third tooth.

**Description of the adult and terminal larvae of a new species, *Phanacis comosae* Nieves-Aldrey sp. nov.**

*Phanacis comosae* Nieves-Aldrey n. sp.

**Type material. Holotype:** 1 ♀, card mounted, SPAIN, Cádiz, Jerez de la Frontera, Parque de las Aguilillas, 36° 41.134'N, 06° 03.900'W, 31 m; ex gall in flower heads of *Picris comosa* (Boiss.) Benth. & Hook. f. ex B. D. Jacks (Asteraceae) galls collected on 18/X/2004, insect emerged III/2005, Iñigo Sánchez and J. L. Nieves-Aldrey leg. (in Museo Nacional de Ciencias Naturales, Madrid). **Paratypes:** 4♂♂, 13♀♀ same data as holotype, in Museo Nacional de Ciencias Naturales, Madrid (catalogue number 9928) (1 paratype male and 2 females dissected for SEM observation).

**Additional material.** 13♂♂, 35♀♀, ex gall on heads *P. comosa*, Aguilillas, 27/III/2006; III/06. I. Sánchez leg. **Galls collected or seen on *Picris comosa*,** in Jerez de la Frontera, La Suara, 16/X/2004, I. Sánchez leg.; Jerez, Dehesa Espinola, 3/VI/2007, I. Sánchez leg.; San Fernando, Camposoto, 3/II/2006, I. Sánchez leg.; Villaluenga del Rosario, 22/X/2005, I. Sánchez leg.; PORTUGAL, Algarve, Silves, 29/V/2007; I. Sánchez leg. 15 terminal larvae dissected from galls on flower heads of *Picris comosa*, Las Aguilillas, 16/X/2004, J. L. Nieves leg.

**Etymology.** Named after the host plant, *Picris comosa*.

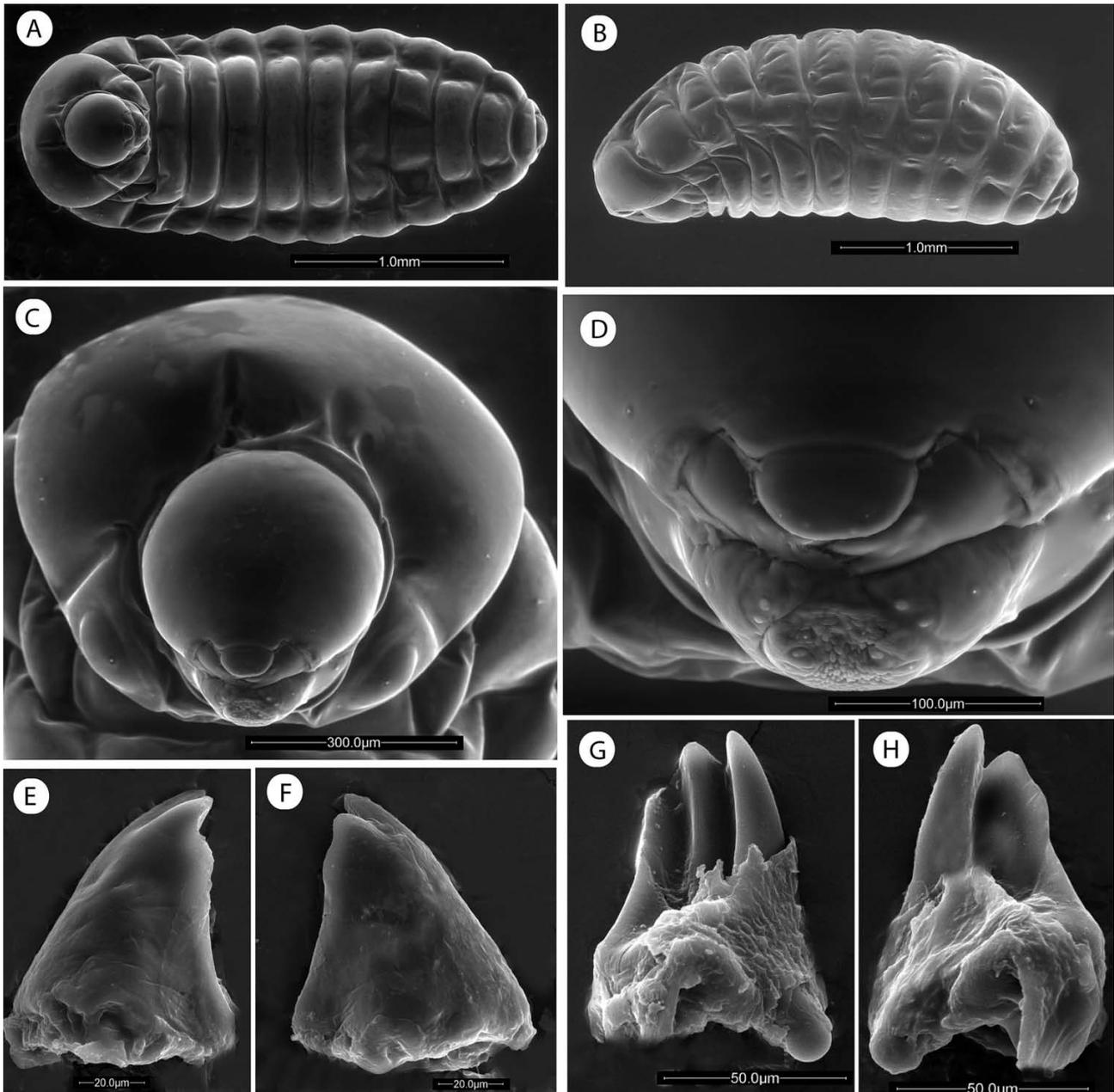
**Description.** Body length, measured from anterior margin of head to posterior margin of metasoma, 3 mm for females (N = 14); 2.5 mm (N = 4) for males. Coloration black; antennal flagellum yellowish, darkened after the sixth flagellomere; coxae of all legs black; distal half of femora, tibiae and tarsi, yellowish.

**Head.** Head, dorsal view, slightly wider than mesosoma; 2.1 as wide as long, POL 1.4 times as long as OOL, posterior ocellus separated from inner orbit of eye by about 3.5 times its diameter. Genae not expanded behind eyes. In anterior view (Fig. 4A), 1.2 times as wide as high; lower face moderately pubescent; facial striae radiating from clypeus extended to compound eyes and to the antennal toruli, absent medially. Upper face and vertex less setose and with reticulate sculpture. Ocellar plate only slightly raised. Lateral margin of gena slightly convergent towards mouth, malar space 0.7 times the height of compound eye. Clypeus rectangular, 1.3 times as wide as long, ventral clypeal margin slightly sinuate, entire, not projected over mandibles. Anterior tentorial pits visible, epistomal sulcus not impressed. Antennal toruli situated at mid height of compound eye, 2.4 times as close to vertex as ventral margin of clypeus; distance between antennal rim and compound eye about as long as width of antennal socket, including rim. Occiput moderately pubescent, with alutaceous-reticulate sculpture (Fig. 4B), without occipital carina. Distance between occipital and oral foramina as long as height of occipital foramen. Hypostomal sulci well impressed; joining at hypostomata; median hairy strip of hypostomal bridge narrow. Oral foramen about 2 times

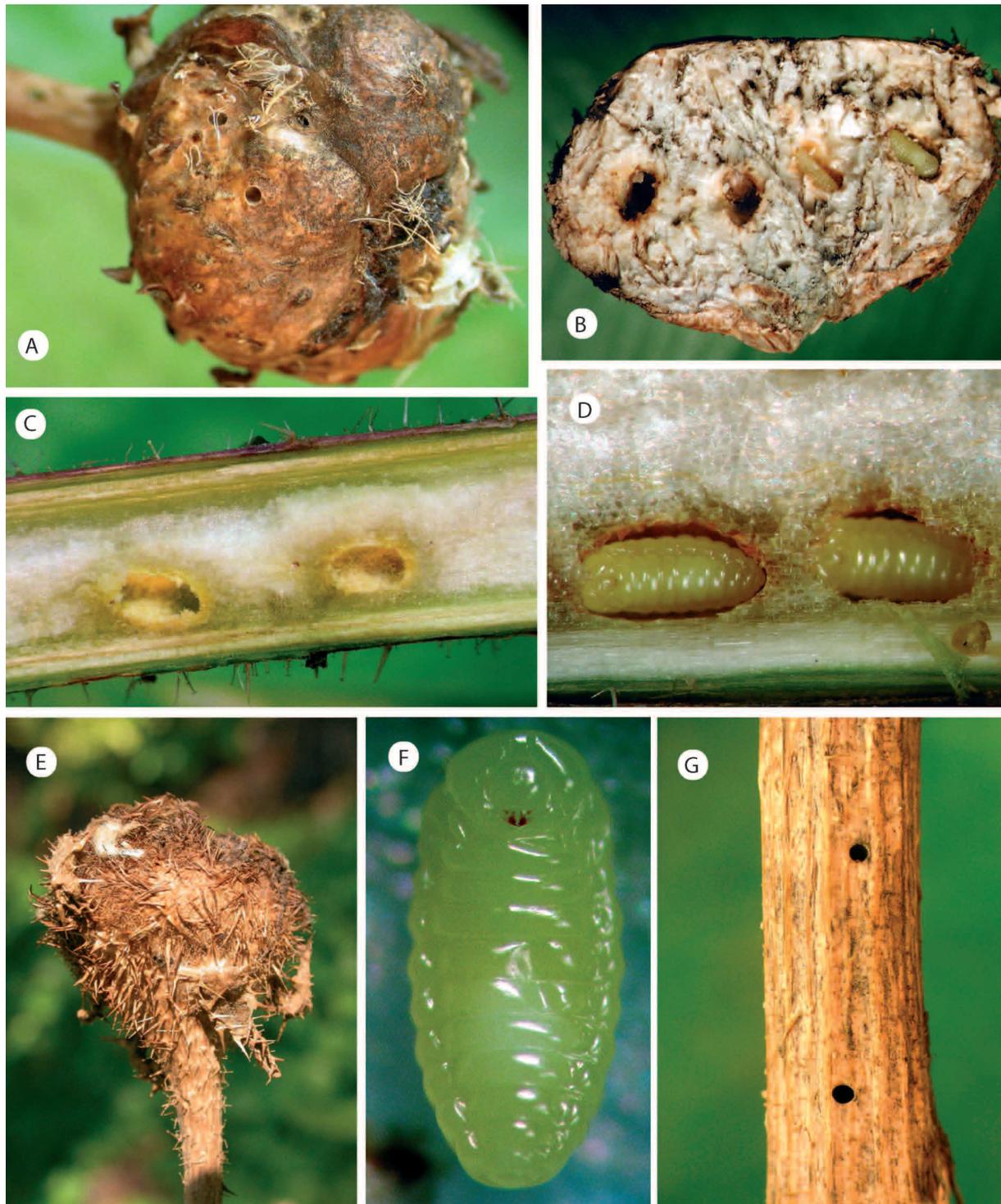
as high as occipital foramen. **Mouthparts.** Mandibles strong, exposed; right mandible with 3 moderately acute teeth; left with 2 teeth. Maxillary stipes long, about 4 times as long as broad, reaching base of labial palps. Maxillary palp 5-segmented: first segment very short, as wide as long; second about 1.6 times as long as wide; third to fourth segments 2 times as long as broad; fifth segment long, 3 times as long as fourth. Prementum more or less conical. Labial palp 3-segmented; lengths as 16:6:25. **Antennae,** female (Fig. 5D) slender; 0.7 times as long as body, with 13 antennomeres; flagellum not broadening apically. Elongate placodeal sensilla present on all flagellomeres except the first, the second, and base of third. Length of antennomeres: 16:13:29:27:25:25:20:21:18:17:15:28. Pedicel 1.6 times as long as wide (Fig. 5C); F1 curved and distinctly, although slightly, expanded at apex. Placodeal sensillae long, three widely spaced sensillae, disposed in a single row, visible in each flagellomere; pores present in three last flagellomeres (Fig. 5B). Male antenna (Fig. 5A), with 14 antennomeres; F1 more distinctly curved and expanded distally; placodeal sensillae present in all flagellomeres; 6-8 close spaced sensillae being visible per segment. **Mesosoma.** Pronotum, female (Fig. 4D). Length of pronotum medially (= shortest distance between dorsal and anterior margins) moderately long (high); in lateral view, ratio of length to width of pronotum (measured near mesopleural spiracle) = 0.31. Admedian pronotal depressions united medially, forming a transverse impression anteriorly on the pronotum. Posterior pronotal plate rectangular, setose with weak reticulate sculpture. Lateral surface of pronotum with marked reticulate sculpture. Spiracular incision of pronotum distinct and deep. Mesonotum. Mesoscutum (Fig. 4E) 1.5 times as wide as long; with reticulate sculpture and with some scattered short setae. Median mesoscutal impression well impressed in posterior one half of mesoscutum, faint anteriorly; at its wider part narrower than the distance between the notauli and the mesoscutal impression, measured through transscutal suture. Notauli complete; shallower anteriorly, slightly convergent in posterior third of mesoscutum. Anteroadmedian signa very shallowly impressed, almost indistinct. Mesoscutum and scutellum separated by a distinct transscutal suture. Scutellar foveae ellipsoidal, about 0.17 as long as scutellum, foveae smooth, separated by a septum; their anterior and posterior margins well marked; anterior margins forming an arc diverging from the transscutal suture. Scutellum in lateral view extending posteriorly slightly past dorsellum. Dorsal surface of scutellum with marked reticulate sculpture, strongly rugose posteriorly. Axillula densely pubescent. Posterodorsal and posterior margins of axillula distinct. Posterior part of axillar strip extended dorsally (Fig. 4C). Mesopleuron beneath mesopleural triangle almost completely covered with reticulate sculpture (Fig. 4C). Mesopleural triangle distinctly impressed and densely pubescent, dorsal and ventral margins of which are clearly marked. Metanotum (Fig. 4F). Metascutellum conspicuously constricted medially. Bar ventral to metanotal trough almost with rugose sculpture. Metanotal trough narrow and densely pubescent. Metapectal-propodeal complex. Metapleural sulcus meeting anterior margin of metapectal-propodeal complex at about mid-height of the latter. Lateral propodeal carinae narrow, subparallel or slightly divergent posteriorly. Lateral and median propodeal area with rugose sculpture and densely pubescent. Nucha dorsally rugose. **Legs.** Metatibia 1.12 times as long as protarsus. First metatarsomere almost as long as following metatarsomeres combined. Tarsal claws simple, without a basal lobe or tooth. **Forewing** (Fig. 3C). 0.86 times as long as body,

hyaline. Radial cell 2 times as long as wide; R1 prolonged along anterior margin of wing but the vein is despigmented in posterior two thirds, the radial cell appearing as open along anterior margin.; first abscissa of radius (2r) curved and radius (Rs) slightly bowed, reaching anterior margin of wing. Areolet distinct. Hair fringe along apical margin of wing long. **Metasoma.** Female metasoma (Fig. 5E) 1.2 as long as head and mesosoma combined. In lateral view, 1.6 times as long as high.

Third abdominal tergum covering about one third of metasoma, about 1.7 times as long as fourth tergum; antero-medial area of third abdominal tergum with sparse setae but not forming a distinct patch. Fourth to seventh terga smooth, bare, without micropunctures clearly visible. Projecting part of hypopygial spine short, as long as basal height of spine; ventrally with some short hairs.



**Figure 6** Terminal-instar larva of *P. caulicola* (excepting B) (SEM). **A**, Body ventral view; **B**, Body lateral view of larva of *P. comosae*; **C**, Anterior view of the head; **D**, Anterior view of mouth parts; **E**, Anterior view of left mandible; **F**, Anterior view of right mandible; **G**, Posterior view of left mandible; **H**, Posterior view of right mandible.



**Figure 7**

Galls and terminal larvae of species of *Phanacis* gall inducers on *Picris* (LM). **A**, Gall of *P. helminthiae* on flower receptacle of *P. aculeata*; **B**, Section of a gall; **C**, Longitudinal section of a gall of *P. caulicola* in stems of *P. echioides*; **D**, Detail of dissected larval cells with larvae; **E**, Gall of *P. comosae* **nov. sp.**, in flower heads of *P. comosa*; **F**, A mature larva of *P. caulicola*; **G**, Emergence holes in a galled stem of *P. echioides* by *P. caulicola*.

### Terminal instar larva.

**Material examined.** Spain, Cádiz: Jerez de la Frontera, Las Aguilillas (n = 10), ex gall in heads of *Picris comosa*.

**Description.** Practically indistinguishable from the larva of *P. caulicola* (Fig. 6B). Dimensions, 2.3-3.1 (2.7) mm length, 1.1-1.4 (1.15) mm width. **Mouthparts.** Labium partially hidden by the first body segment in the specimen examined, but predictably, as in the larva of *P. caulicola*. **Mandibles.** Slightly asymmetrical, Right mandible, with two teeth; left mandible with three teeth.

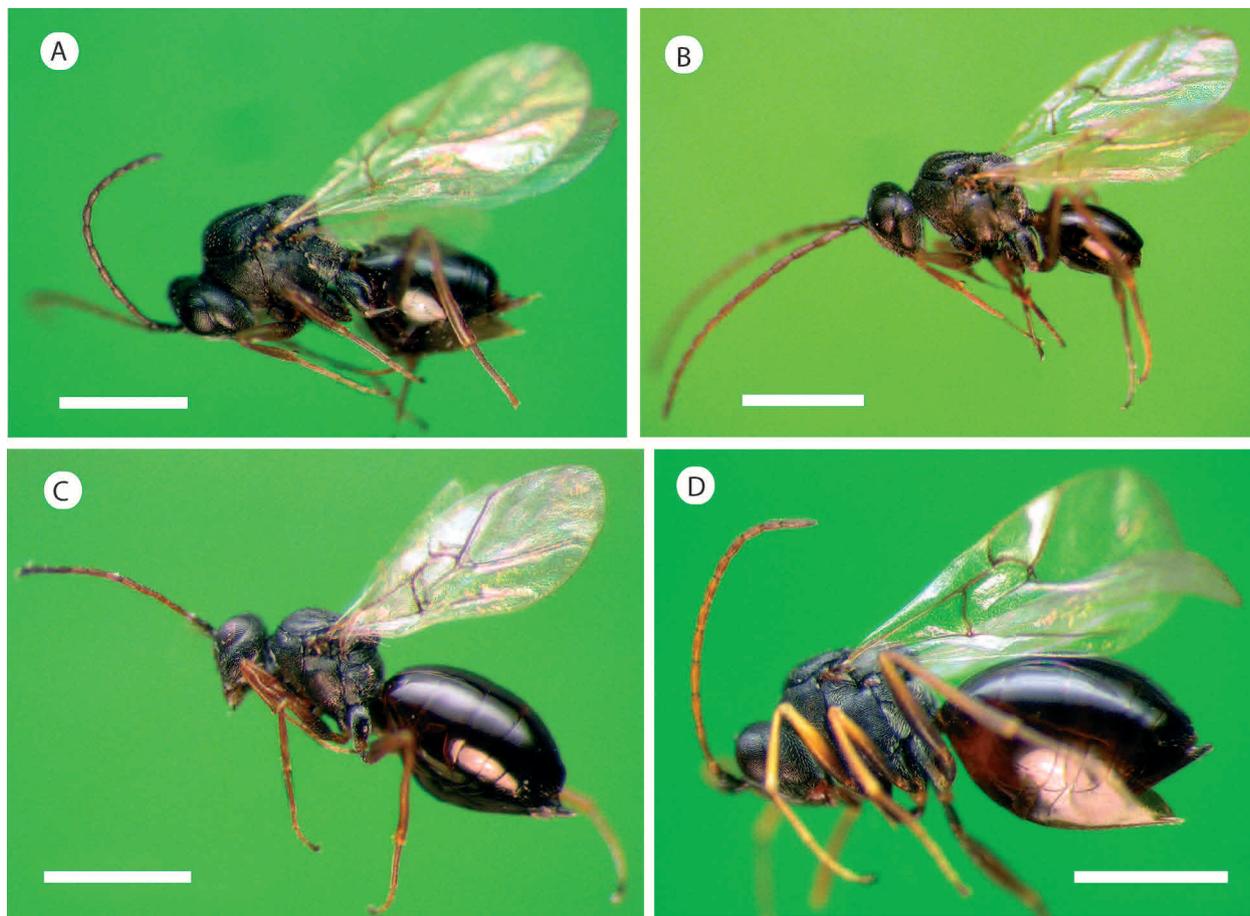
**Gall** (Fig. 7E). Galls are plurilocular (polythalamous) and formed in the terminal flower heads of *Picris comosa* sbsp. *comosa* as is also the case in *P. comosa* sbsp. *lusitanica* (Wellw. ex Schlecht.) Talavera (Asteraceae) (Fig 7E). All of the floral receptacle is transformed into a globular mass measuring from 8 x 14 mm to 17 x 20 mm. The surface of the galls, like the rest of the host plant, is covered by strong bristles. Internally the gall contains a variable number of larval cells (3-10) within a white hard medullar tissue. Larval cells are oval or ellipsoidal, measuring about 2.5 x 1.5 mm. Galls are relatively hard after drying. The size of whole galls is variable, depending on the number of enclosed larval cells and wrapping leaves; on average

measuring about 15 mm in diameter. In spring (early May), the galls develop and they mature in late spring and summer. Galls remain on the dry plants in summer and early autumn.

**Remarks.** *Phanacis comosae* n. sp. is closely allied to *P. caulicola*. However, the two species can be readily distinguished by the characters outlined in the identification key, mainly the relative length of the antennal pedicel, the venation of the radial cell, the conformation of the medial mesoscutal impression and the scutellar foveae, and especially, by their respective galls. The galls are conspicuous in flower heads in the case of the gall induced by the new species, whereas the galls of *P. caulicola* are cryptic in stems.

**Life cycle.** The life cycle is univoltine, a single brood synchronized with its annual host plant. Adult gall wasps emerge in spring, after overwintering in the gall, when the host plants are available. The sex ratio of *P. comosa* is about 1:1, suggesting sexual reproduction.

**Distribution.** Based on our data, the new species seems to be confined to the Southwest portion of the



**Figure 8** Habitus of *Phanacis* species inducing galls on *Picris*. **A**, *P. helminthiae* female; **B**, *P. helminthiae* male; **C**, *P. caulicola* female; **D**, *P. comosae* female. Scale bar = 1 mm.

Iberian Peninsula, in Spain and Portugal, following the distribution of its host plant *Picris comosa*.

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