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New records and hosts of *Kinseyella* Pujade-Villar & Melika from Mexico, with redescription of *K. lapiei* (Hymenoptera: Cynipidae: Cynipini)

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ABSTRACT

The genus *Kinseyella* Pujade-Villar & Melika was recently described from Mexico, with two species: *K. lapiei* (Kieffer) and *K. quercusobtusata* Pujade-Villar & Melika. *Kinseyella lapiei* which had not been collected since its original description is redescribed from two new localities in Mexico. New host oaks for both species are recorded. The morphological variability of *K. quercusobtusata* is discussed; a key to both species is given. Diagnostic characters are illustrated.

Key words: Cynipidae, *Kinseyella*, taxonomy, morphology, distribution, biology, key.

RESUMEN

El género *Kinseyella* Pujade-Villar & Melika, recientemente descrito de México, agrupa dos especies *K. lapiei* (Kieffer) y *K. quercusobtusata* Pujade-Villar & Melika. La primera de ellas no había vuelto a ser recolectada desde su descripción. En este estudio se redescribe *Kinseyella lapiei* después de dos nuevas localidades en México. Se proporcionan nuevos huéspedes para las dos especies mencionadas. Se discute la variabilidad morfológica observada en *K. quercusobtusata*, se incluye una clave para diferenciar las dos especies incluidas en el género y se ilustran los caracteres diagnósticos.

Palabras clave: Cynipidae, *Kinseyella*, taxonomía, morfología, distribución, biología, clave.

INTRODUCTION

A total of 154 species of cynipid gallwasps are known from Mexico (Melika *et al*., 2009, 2011; Pujade-Villar *et al*., 2009, 2010, 2011a, b), which associate with only 30 oak species (Pujade-Villar *et al.*, 2009), while approximately 150 species of *Quercus* occur in this country (Govaerts & Frodin, 1998; Valencia, 2004). Compare to the host oaks diversity, the actual number of described mexican Cynipidae is very low. Mexico is a very interesting region because of its location in the transition area between Nearctic and Neotropics, which includes the mountains of the Centre of Mexico, which are assigned to the provinces of the Sierra Madre Oriental, Sierra Madre Occidental, Trans-Mexican volcanic Belt, Cuenca del Balsas and Sierra Madre del Sur (Morrone, 2005). Recently, a new genus, *Kinseyella* Pujade-Villar & Melika (in Pujade-Villar *et al*. 2010), was described from this region, with one new species, *K. quercusobtusata* Pujade-Villar & Melika, which is associated with section *Quercus* (white oaks) according to Pujade-Villar *et al*. (2010). In addition, a species described in *Disholcaspis* Dalla Torre & Kieffer 1910 was transferred to *Kinseyella*, *K. lapiei* (Kieffer, 1911) (=*Holcaspis weldi* Beutenmüller). This species had not been collected since its original description in 1911. New data on the morphology, biology and hosts of the two mentioned species from the State of Puebla is given.

The gall structure, typical for *Kinseyella* (spherical, thin-walled unilocular gall, with a central larval chamber supporting by radiating fibres), evolved independently in several genera of Nearctic cynipids: *Amphibolips* Reinhard (associate with red oaks section, Lobatae), some *Andricus* Hartig (=*Trichoteras* Ashmead) (on golden cup oaks, Protobalanus), and *Cynips* L. complex (*Atrusca* Kinsey, *Antron* Kinsey and *Besbicus* Kinsey) (on white oaks). The surface of *Kinseyella* galls covered with a dense rusty-brown felt-like pubescence. It is complicate to differentiate *Kinseyella* species based on galls; adults are required for the precise species identification. After obtaining fresh material from Mexico, the redescription of *K. lapiei* is given and morphological variability of both *Kinseyella* species is commented.

MATERIAL AND METHODS

Galls were collected from endemic mexican oaks, *Quercus laeta* Liebm., *Q. splendens* Née, *Q. resinosa* Liebm., *Q. obtusata* Bonpl. and *Q. mexicana* Bonpl., and adults were reared by the mexican coauthors.

We follow the current terminology of morphological structures (Liljeblad & Ronquist, 1998; Melika, 2006). Abbreviations for forewing venation follow Ronquist & Nordlander (1989), cuticular surface terminology follows that of Harris (1979). Measurements and abbreviations used here include: F1–F12, 1st and subsequent flagellomeres; POL (post-ocellar distance) is the distance between

the inner margins of the posterior ocelli; OOL (ocellar-ocular distance) is the distance from the outer edge of a posterior ocellus to the inner margin of the compound eye; LOL, the distance between lateral and frontal ocelli. The width of the forewing radial cell is measured from the margin of the wing to the Rs vein.

SEM pictures were taken with a Stereoscan Leica-360 at a low voltage (1.0 KV) and without coating, in order to preserve the specimens.

The type material is deposited in the following institutions: J. Pujade-Villar collection in the University of Barcelona (Barcelona, Spain; UB); the collection of the Pest Diagnostic Laboratory (PDL), Tanakajd, Hungary (curator G. Melika).

The type series of *Holcaspis weldi* is deposited in the Museum of Comparative Zoology (MCZ, Harvard University), the United States National Museum (USNM, now National Museum of Natural History, Smithsonian Institution, Washington DC, USA) and the American Museum of Natural History (AMNH, New York Ci, USA), has been studied (JP-V and GM).

RESULTS

Kinseyella lapiei (Kieffer, 1911)

(Figs. 1–2, 3a, 3h, 4a)

Disholcaspis lapiei Kieffer, 1911: 346-347. Melika & Abrahamson, 2002: 172. Host Unknown.
Holcaspis weldi Beutenmüller, 1911: 86-87. Synonymy in Weld, 1952: 300. On *Q. rugosa.*
Adleria lapiei (Kieffer) Weld, 1952: 300.
Andricus lapiei (Kieffer) Benson, 1953: 220.
Kinseyella lapiei (Kieffer) Pujade-Villar *et al*., 2010: 23

Redescription: Asexual female.

Length. Female 2.9–4.1 mm (n = 6).

Colour. Head, mesosoma and coxae uniformly amber; metasoma red-testaceous, with distal tergites darker, dorsally lighter; all legs (except coxae and trochanters) uniformly chestnut red, distal tarsi darker.

Head (Fig 1), narrower than mesosoma, uniformly coriaceous, covered with short dense white setae, 1.5 times as broad as high, 2.1 times as broad as long from above, ovate in frontal view; transfacial distance 1.3 times as long as height of eye; gena strongly broadened behind eye, 1.6 times as broad as cross diameter of eye (measuring along transfacial line); malar space 0.4 times as long as eye height, with very delicate short striae, radiating from clypeus and nearly reaching eye margin; malar sulcus absent. POL: OOL: LOL = 8:7:4, diameter of lateral ocellus proportionally 2.5; lower face and front coriaceous. Clypeus impressed, flat, rounded, delicately coriaceous, broadly emarginated ventrally, medially not incised, anterior tentorial pits small, indistinct; epistomal sulcus and clypeo-pleurostomal line distinct, broad, impressed.

Antenna (Fig. 1a) 14-segmented; F1 slightly longer than F2, F2 broader distally; subsequent flagellomeres progressively shorter, F12 longer than F11. Antennal formula: 8: 6(x2.5): 12(x3): 10(x4): 8: 7: 6: 5: 4: 4: 3: 3: 3: 5. All flagellomeres with placodeal sensilla.

Mesosoma (Figs 2a–b, 3a) longer than high, slightly concave laterally. Pronotum coriaceous laterally, with few weak striae, anterolateral rim of pronotum strongly carinated, with deep invagination along anterior side. Mesoscutum slightly broader than long, uniformly microreticulate. Notauli incomplete and superficial, extending the most to 2/3 length of mesoscutum, median mesoscutal line longer but very superficial; parapsidal lines indistinct, only differentiated by a light-brown coloration. Mesoscutellum rounded, as long as broad, dull rugose along margins, disk strongly coriaceous; scutellar foveae superficially defined, transversally ovate, with longitudinally carinae on shiny bottom. Mesopleuron coriaceus, with dense white setae. Propodeum coriaceous and weakly rugose around nucha, with dense setae; lateral propodeal carinae distinct, complete, parallel in the upper 1/3 part of propodeum and strongly curved behind mid-height, central propodeal area almost smooth and shiny. Metascutellum subrectangular, coriaceous. Ventral bar of metanotal trough shiny, longitudinally striate, slightly narrower than height of metanotal trough, which delicately coriaceous, shiny, with setae and some parallel longitudinal carinae.

Forewing (Fig. 2e) 1.2 times longer than body, weakly brown-infuscated, with uniform dense setae and cilia on margins; radial cell opened, around 3.2 times as long as broad; veins dark brown, areolet triangular, closed.

Legs. Tarsal claws with distinct lobe.

Metasoma (Figs. 2c–d) as long as head+mesosoma, as high as long; all metasomal tergites smooth dorsally, alutaceous laterally, with dense white setae laterally. Ventral spine of hypopygium short, prominent part nearly 1.4 times as long as broad, with parallel sides along entire length, without narrowing to a point at apex, with tuft of long subapical setae, reaching far beyond apex.

Type material of *Disholcaspis lapiei* probably lost. Authors were unable to locate the type (Pujade-Villar *et al*., 2010). Weld (1952) stated that the holotype is deposited in the Zoological Museum of the University in Berlin and presumably it was examined by him. All loan requests for the type to many European museums, where Kieffer cynipid types known were deposited, failed; curators were unable to locate the type. However, the original description of *D. lapiei* does agree with examined *D. weldi* females and galls and, thus we accepted Weld's (1952) synonymization. **Type material of *Holcaspis weldi*** has been studied in Pujade-Villar *et al*. (2010). It is deposited in MCZ, AMNH and USNM.

Additional material examined. MEXICO (009): Estado de Puebla, Municipio: Tecali de Herrera, Colonia: Oasis, Africam Safari, UTM 0590952 X y 2093973 Y; *Quercus laeta*, (5.viii.2011) 12.viii.2011: 5♀ (2♀ deposited in PDL), leg. Lilia Ramírez Santamaría; MEXICO (010): Estado de Puebla, Municipio: Tecali de Herrera, Colonia: Oasis, Africam Safari, UTM 0590957 X 2093962 Y; *Quercus splendens*, (12.viii.2011) 19.viii.2011: 5♀ (2♀ deposited in PDL), leg. Lilia Ramírez Santamaría".

Gall (Fig. 4a)**.** A leaf gall, almost always on the underside, usually attached to the midrib, more rarely on the lateral veins or leaf petiole. Usually one gall per leaf, sometimes two-three. Unilocular, approximately spherical, 20–40 mm in diameter, yellowish and tinged with pink and red when mature, the surface with dense rusty-brown felt-like pubescence. The gall is very fragile, with a very thin external wall. The hard larval chamber is 3–4 mm in diameter, with 2–3 mm thick hard wall, in rusty dense hairs and located in the centre of the gall, supported by numerous radiating brown fibres.

Host oaks. *Quercus rugosa* Née, *Q. laeta* and *Q. splendens* (Section *Quercus* '*sensu stricto*'). Kieffer (1911) mentioned that the host is unknown for *H. lapiei* while Beutenmüller (1911)

reported this species from *Q. rugosa*. We collected this species on *Q. splendens* and *Q. laeta*. This is the first record of a cynipid gallwasp from an endemic Mexican oak, *Q. splendens*.

Distribution. Mexico: Cuernavaca (Estado de Morelos) (Kieffer, 1911), Mexico (Distrito Federal) (Beutenmüller, 1911) and Tecali de Herrera (Estado de Puebla) (new record).

Biology. Only the asexual generation is known. The gall starts to develop in summer and mature in August; adults start to emerge in late summer and prolong autumn. Several unidentified parasitoids (from Eurytomidae, Eulophidae and Torymidae: Chalcidoidea) have been reared from these galls.

***Kinseyella quercusobtusata* Pujade-Villar & Melika, 2010**

Material examined. MEXICO (064): Tecolote-Zacatecas (Estado de Zacatecas), *Q. resinosa*, (15.x.2011) 27.x.2011: 8♀ (3♀ G. Melika col.); MEXICO: Santa Fe (Delegación Cuajimalpa, México DF), *Q. laeta*, 2400 m., (10.vii.2011) 20-25.vii.2011: 5♀ (2♀ G. Melika col.), leg. David Cibrián Tovar; MEXICO Parque Nacional Bosque del Pedregal (= Bosque de Tlalpan, México DF), *Q. mexicana* (21.vii.2010) viii.2010: 1♀; Parque Nacional Bosque del Pedregal (= Bosque de Tlalpan, México DF), *Q. mexicana*, (29.vii.2011) viii.2011: 1♀ (leg. Míriam Serrano Muñoz).

Host gall. Previously was known only from *Q. obtusata.* In this study it was collected from Mexico DF on *Q. laeta* and *Q. mexicana*, and from Zacatecas on *Q. resinosa*.

Distribution. Mexico. Species was known from different areas of Estado de Mexico (Pujade-Villar *et al*., 2010). Mexico DF and Zacatecas states are new records.

DISCUSSION

After the examination of reared specimens, we found some characters variable. This species has very indistinct incomplete propodeal carinae in type specimens, collected from *Q. obtusata* (Fig. 3b) and also in newly obtained specimens reared from galls on *Q. laeta* and *Q. mexicana* (Fig. 3d), while specimens reared from galls on *Q. resinosa*, possess with more or less distinct, complete, irregularly shaped propodeal carinae (Fig. 3c). In the majority of the obtained and examined specimens, the mesoscutum with three darker longitudinal stripes (Fig. 3g), indistinctly marked in specimens from *Q. resinosa*, and absent in specimens from *Q. mexicana* (similar to Fig. 3h). The medial mesoscutal line vary in length and shape, weakly impressed in all specimens, except those from *Q. resinosa* (Figs 3e-f, respectively).

The two species can be differentiated according to the following key:

-- Mesoscutum usually with longitudinal dark stripes (Fig. 3g); propodeum with very indistinct, incomplete propodeal carinae or with irregular rugae in central propodeal area (Figs. 3b–d); metasomal tergites smooth dorsally, alutaceous laterally; metascutellum weakly curved basally (Figs. 3b–d) …….....…. ..... ***K. quercusobtusata* Pujade-Villar & Melika**

-- Mesoscutum without longitudinal dark stripes (Fig. 3h); propodeum with distinct propodeal carinae, parallel in anterior half and bented outwards in posterior half of propodeum (Fig. 3a); metasomal tergites alutaceous-reticulate dorsally and laterally; metascutellum strongly incised basally (Fig. 3a) …… .....……. ***K. lapiei* (Kieffer)**

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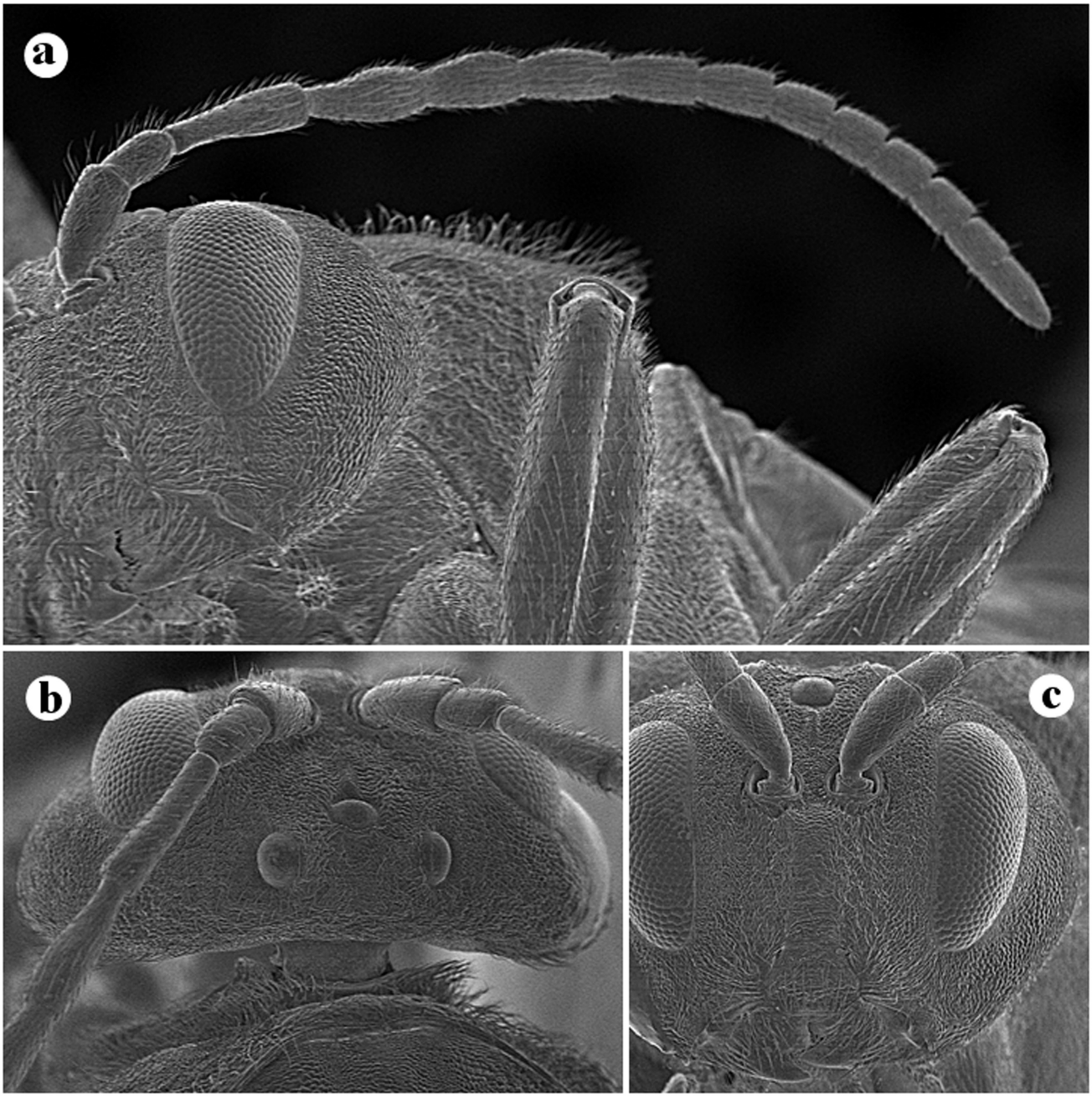

Figure 1. *Kinseyella lapiei*: a, head and antenna (lateral view); b, head (dorsal view); c, head (anterior view). [Photos by Palmira Ros-Farré].

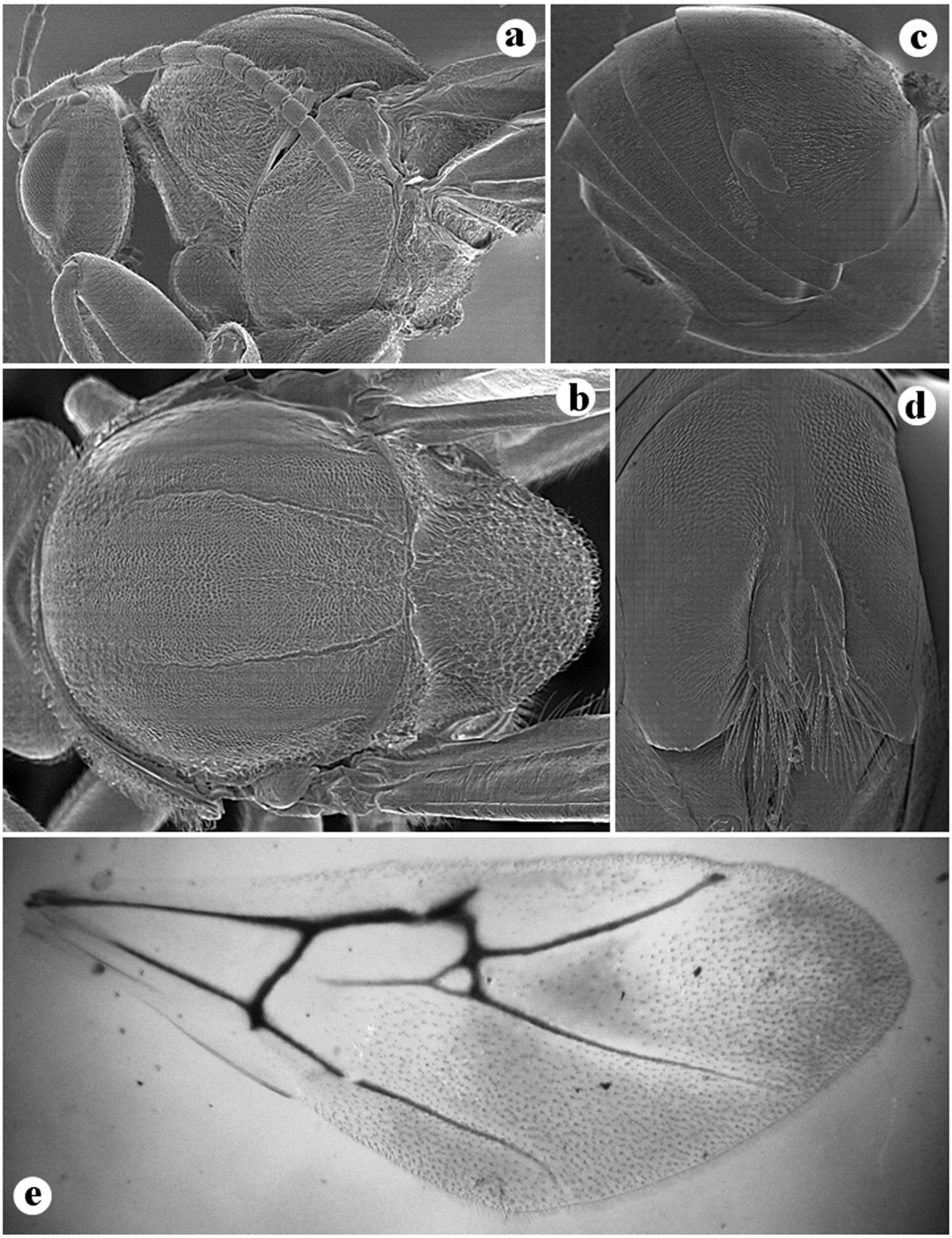

Figure 2. *Kinseyella lapiei*: a, mesosoma (lateral view); b, mesosoma (dorsal view); c, metasoma (lateral view); d, ventral spine of hypopygium (ventral view); e, forewing. [Photos a-d by Palmira Ros-Farré and e by J. Pujade-Villar].

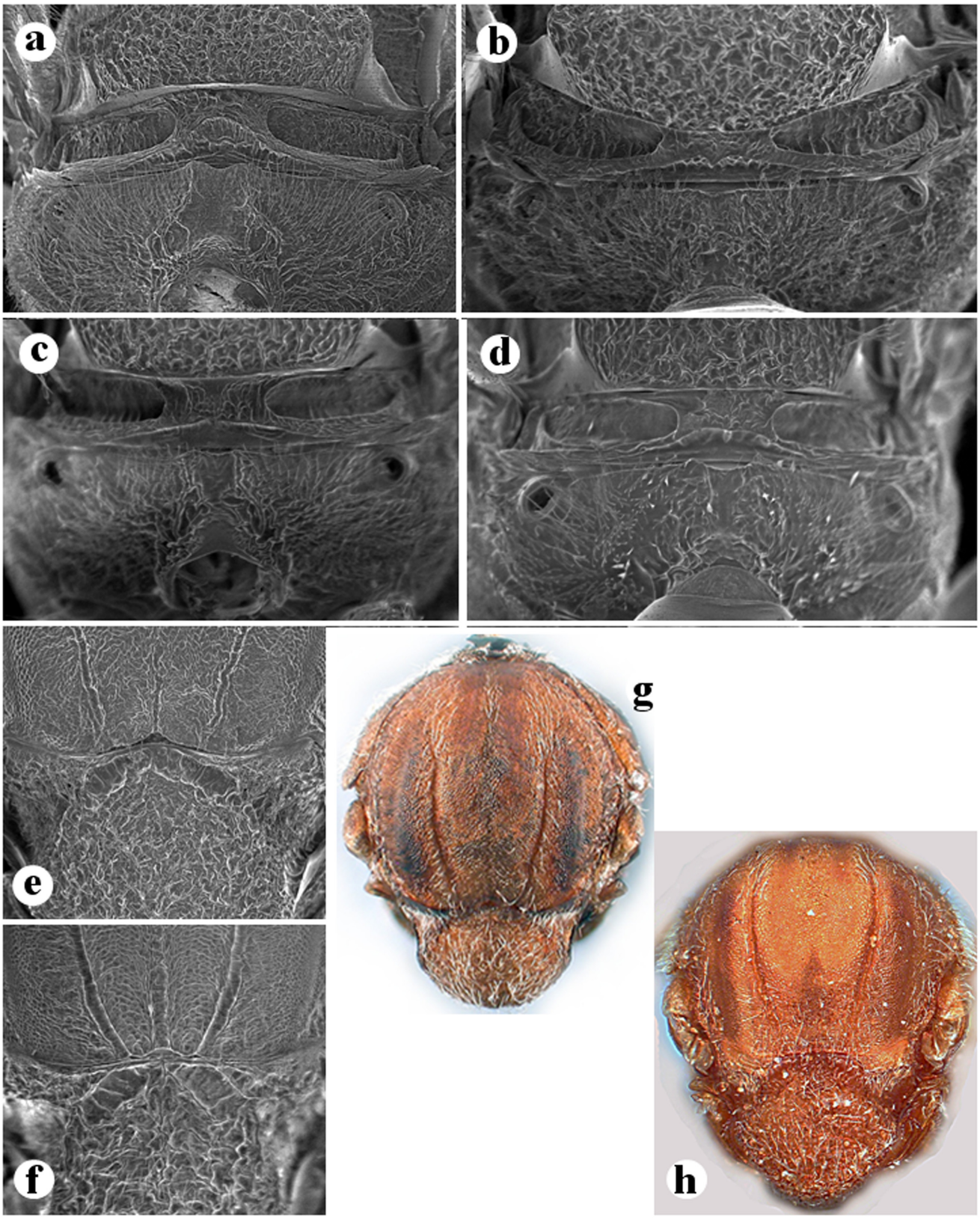

Figure 3. a–d, propodeum (dorsal view): a, *Kinseyella lapiei*; b, *K. quercusobtusata* (holotype); c, *K. quercusobtusata* from Zacatecas on *Q. resinosa*; d, *K. quercusobtusata* from Mexico DF on *Q. mexicana*. e–f, mesoscutum and mesoscutellum junction area of *K. quercusobtusata*: e, holotype; f, specimen from Zacatecas on *Q. resinosa*. g–h, mesoscutum: g, *K. quercusobtusata* (type); h, *K. lapiei* (type). [Photos a-f by Palmira Ros-Farré and g-h by G. Melika].

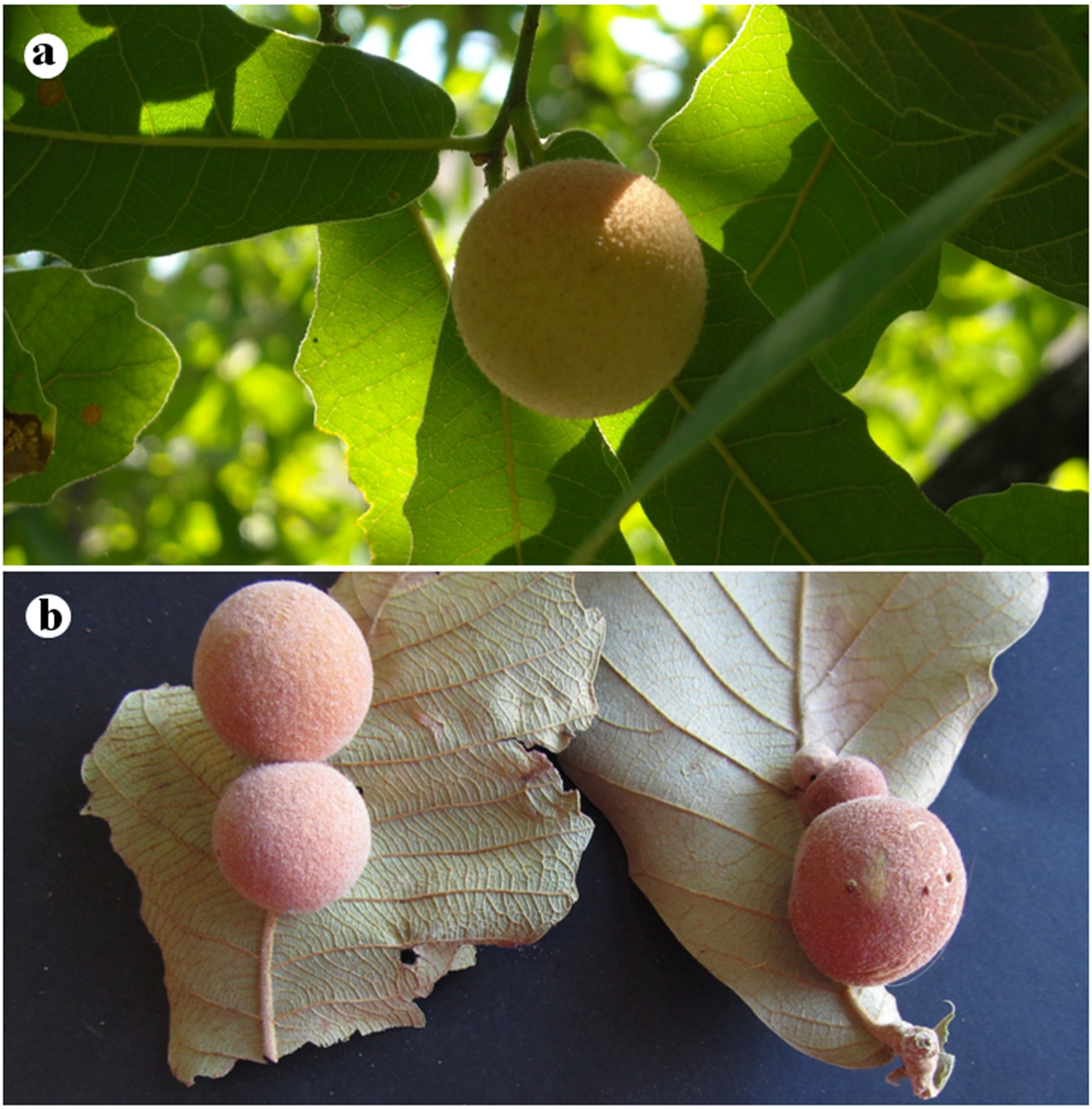

Figure 4. Galls: a, *Kinseyella lapiei* on *Q. splendens* [Photo by L. Ramírez-Santamaría]; b, *K. quercusobtusata* on *Q. resinosa* [Photo by J. Pujade-Villar].

Verde
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