

Check-list of oak gall wasps of Hungary, with some taxonomic notes (Hymenoptera: Cynipidae, Cynipinae, Cynipini)

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Abstract – We listed 95 species of oak cynipid gall inducing wasps (Hymenoptera: Cynipidae, Cynipinae) for the Hungarian fauna. Life-cycles, host plant associations, synonymy for each species are given; 10 new valid names are proposed; one new bisexual form, *Andricus hystrix follioti* KIEFFER was found; two new combinations are proposed; one nomen dubium and 4 nomina nuda are established; 7 species, 14 subspecies and 5 species varieties are synonymized; lectotype female for *Andricus krajnovici* TAVARES, 1901 is designated. With 93 figures.

INTRODUCTION

About 120 species of oak cynipid gall inducing wasps (Hymenoptera: Cynipidae) are known from Europe and contiguous territories (North Africa, Asia Minor). The oak gall cynipid fauna of Hungary was studied by several researchers (AMBRUS 1957, 1958, 1959, 1960, 1961, 1964a, b, c, 1966, 1968, 1969, 1970, 1971a, b, 1974a, b, 1975, 1978, 1979, 1981; BALÁS 1935, 1939a, b, c, 1941a, b, 1943a, b, 1948; CSÓKA 1997, 1998; CSÓKA *et al.* 1995; CSÓKA & MELIKA 1993; MELIKA 1995; MELIKA & BECHTOLD 1999; MELIKA & CSÓKA 1994; MÉHES 1922, 1943, 1953; MOESZ 1938; PASZLAWSZKY 1882, 1883, 1884). AMBRUS (1974a), in his overview work on the Hungarian oak cynipids, listed 101 species of oak gall-inducing cynipid wasps, which trophically associate with *Quercus cerris*

L., *Q. petraea* (MATTUSCHKA) LIEBLEIN, *Q. pubescens* WILLD., *Q. robur* (L.), and *Q. farnetto* TEN. However, nomenclature of many species has been changed since, several species were synonymized, some species were listed for the Hungarian fauna erroneously and, thus, a new check-list is essential.

The first two authors have studied the Hungarian oak cynipid fauna since 1991 and, thus, material was collected from the entire territory of the country.

For taxonomic purposes, material was examined from the following institutions: cynipid collection of the Systematic Parasitoid Laboratory, Kőszeg, Hungary, Hungarian Natural History Museum, Budapest, Hungary (HNHM), Museo Nacional de Ciencias Naturales, Madrid, Spain (MCNM); Museum of University of Barcelona, Spain; Musée National d'Histoire Naturelle, Paris, France (MNHP), Naturhistorisches Museum, Vienna, Austria (NHMW), The Natural History Museum (British Museum), London, England (NHML), Zoologische Sammlungen des Bayerischen Staates, Munich, Germany (ZSBS).

Below we list 95 species of oak cynipid gall inducing wasps occurring in Hungary from the following genera: *Andricus* HARTIG, 1840 (64 species), *Aphelonyx* MAYR, 1881 (one species), *Biorhiza* WESTWOOD, 1840 (one species), *Callirhytis* FOERSTER, 1869 (one species), *Chilaspis* MAYR, 1881 (one species), *Cynips* LINNAEUS, 1758 (seven species), *Dryocosmus* GIRAUD, 1859 (three species), *Plagiotrochus* MAYR, 1881 (one species), *Neuroterus* HARTIG, 1840 (13 species), and *Trigonaspis* HARTIG, 1840 (two species). Only those oak species for the cynipid host plant associations are listed which are native for Hungary. Some Mediterranean oak hosts are not included.

Ten new valid names are proposed; two new combinations are also proposed: *Andricus infectorius* (HARTIG, 1843) and *A. singularis* MAYR, 1871; one new bisexual form, *Andricus hystrix follioti* KIEFFER was found; one nomen dubium and 4 nomina nuda are established; 7 species, 14 subspecies and 5 varieties are synonymized; lectotype female for *Andricus krajnovici* TAVARES, 1901 is designated.

In the references we do not list those authors and their works in which the original descriptions of the species were made. Only those citations are mentioned in the references in which new synonymic names and biological peculiarities are given. Gall figures are given after AMBRUS (1974a). Abbreviations of the authors: GM = GEORGE MELIKA, GC = GYÖRGY CSÓKA, JP-V = JULI PUJADE-VILLAR.

LIST OF SPECIES

Andricus HARTIG, 1840

aestivalis GIRAUD, 1859 – Synonyms: *Cynips* (*A.*) *aestivalis*: KALTENBACH 1867, *Adleria aestivalis*: ROHWER & FAGAN 1917, *Andricus aestivalis*: BENSON 1953. – Only the bisexual generation is known to induce catkin galls on *Q. cerris* (Fig. 1).

ambiguus (TROTTER, 1899) – Synonyms: unisexual generation: *Cynips corruptrix* var. *ambigua* TROTTER, 1899, *Cynips ambigua*: KIEFFER 1897–1901, *Adleria ambigua*: ROHWER & FAGAN 1917, *Andricus ambigua*: BENSON 1953; bisexual generation: *Andricus ambigua* forma *eliana* FOLLIOU & PUJADE-VILLAR, 2000. – Alternate uni- and bisexual generations have been recently established (FOLLIOU *et al.* 2000). The bisexual generation induces galls in buds on *Q. robur*, *Q. petraea*, and *Q. pubescens*; while the unisexual generation induces bud galls on *Q. cerris*. Only the unisexual generation is known for the Hungarian cynipid fauna (Figs 2a-c).

amblycerus (GIRAUD, 1859) – Synonyms: *Cynips amblycera* GIRAUD, 1859, *Adleria amblycera*: ROHWER & FAGAN 1917, *Andricus amblycera*: BENSON 1953. – Only the unisexual generation is known to induce bud galls on *Q. petraea*, *Q. pubescens*, and *Q. robur* (Fig. 3).

amenti GIRAUD, 1859 – Synonyms: unisexual generation: *Cynips* (*A.*) *amenti*: KALTENBACH 1867, *Cynips callidoma* GIRAUD, 1859 (non HARTIG, 1841); bisexual generation: *Andricus giraudianus* DALLA TORRE & KIEFFER, 1910. – Alternate uni- and bisexual generations are known (FOLLIOU 1964). Gall of the unisexual generation grows from the axil of the leaf or bud (Figs 4a-d), gall of the bisexual generation develops on catkins on *Q. petraea* and *Q. pubescens*, less frequently on *Q. robur* (Figs 4e-g).

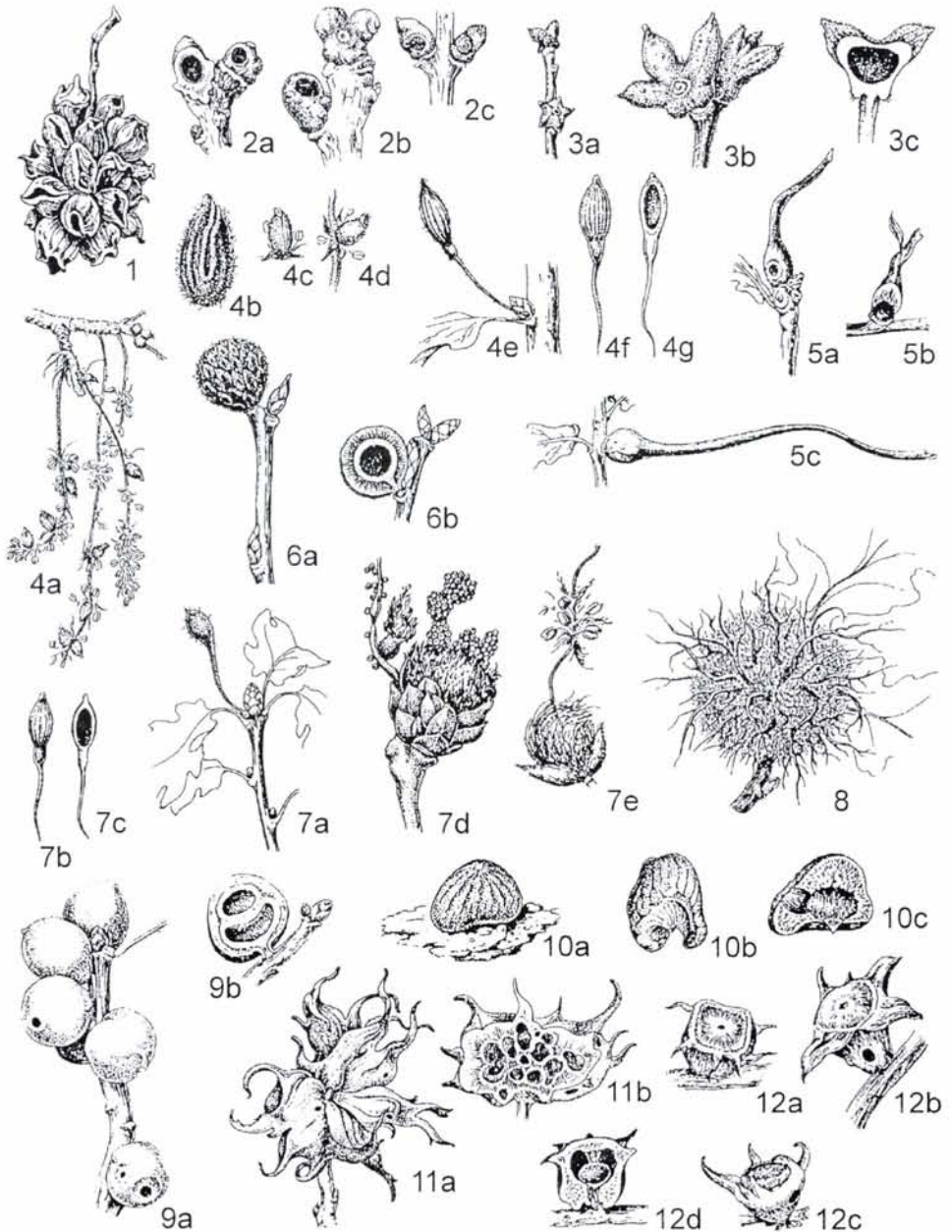
aries (GIRAUD, 1859) – Synonyms: *Cynips aries* GIRAUD, 1859, *Adleria aries*: ROHWER & FAGAN 1917, *Andricus aries*: BENSON 1953. – Only the unisexual generation is known to induce bud galls on *Q. robur* (common host), also *Q. petraea*, and *Q. pubescens* (Figs 5a-c).

burgundus GIRAUD, 1859 – BEJERINCK (in DALLA TORRE & KIEFFER 1910) proposed *Andricus burgundus* GIRAUD as the bisexual generation of *A. tinctoriusnostrus* (STEFANI) and a number of researchers followed it (BUHR 1965, AMBRUS 1974a, KIERYCH 1979). However, later the bisexual generation of *A. infectorius* was found and it appeared that *A. burgundus* was a separate species (NIEVES ALDREY 1982). – Only the bisexual generation is known to induce bud galls on *Q. cerris*.

caliciformis (GIRAUD, 1859) – Synonyms: *Cynips caliciformis* GIRAUD, 1859, *Adleria caliciformis*: ROHWER & FAGAN 1917, *Andricus caliciformis*: BENSON 1953. – Only the unisexual generation is known to induce galls on accessory buds on *Q. petraea*, *Q. pubescens*, *Q. robur* (most common), and *Q. farnetto* (Figs 6a-b).

callidoma (HARTIG, 1841) – Synonyms: unisexual generation: *Cynips callidoma* HARTIG, 1841, *Cynips gallae pistiliformis* ANTHOINE, 1794, *Aphilothrix callidoma*: ADLER 1881, *Andricus callidoma*: MAYR 1882, *Andricus giraudi* WACHTL, 1882; bisexual generation: *Andricus cirratus* ADLER, 1881. – Alternate uni- and bisexual generations are known (ADLER 1881). The unisexual generation (Figs 7d-e) induces gregarious galls at the base of catkins; bisexual generation: in buds on *Q. robur*, *Q. petraea*, and *Q. pubescens* (Figs 7a-c).

caputmedusae (HARTIG, 1843) – Synonyms: *Cynips caput medusae* HARTIG, 1843, *Cynips gallae cristatae* HENSCHEL, 1876, *Adleria caputmedusae*: ROHWER & FAGAN 1917, *Andricus caputmedusae*: BENSON 1953. – Only the unisexual generation is known to induce galls on acorns and on acorn cups on *Q. petraea*, *Q. robur*, and *Q. pubescens*; occasionally on *Q. cerris* and *Q. farnetto* (Fig. 8).



Figs 1–12. Oak galls. 1: *Andricus aestivalis*. 2a–c: *A. ambiguus*. 3: *A. amblycerus*. 4: *A. amenti*: a–d = bi-sexual generation, e–g = unisexual generation (= *A. giraudianus*). 5a–c: *A. aries*. 6a–b: *A. caliciformis*. 7: *A. callidoma*: a–c = unisex. gen., d–e = bisex. gen. 8: *A. caputmedusae*. 9a–b: *A. conglomeratus*. 10a–c: *A. conificus*. 11a–b: *A. coriarius*. 12a–d: *A. coronatus*

conglomeratus (GIRAUD, 1859) – Synonyms: *Cynips conglomerata* GIRAUD, 1859, *Cynips cincta* HARTIG, 1879, *Adleria conglomerata*: ROHWER & FAGAN 1917, *Andricus conglomerata*: BENSON 1953. – Only the unisexual generation is known to induce bud galls on shoots on *Q. petraea*, *Q. pubescens*, *Q. robur*, and *Q. farnetto* (Figs 9a-b).

conificus (HARTIG, 1843) – Synonyms: *Cynips conifica* HARTIG, 1843, *Adleria conifica*: ROHWER & FAGAN 1917, *Andricus conifica*: BENSON 1953 – KIEFFER (1897–1901) described a new variety of this species, *Cynips conificus* var. *longispinae* from Italy. We found no appreciable diagnostic characters for separation this variety and, thus, *Cynips conificus* var. *longispinae* KIEFFER, 1901 is a **syn. n.** to *A. conificus*. – Only the unisexual generation is known to induce galls on older trunks on accessory buds on *Q. petraea*, *Q. pubescens*, *Q. robur*, and *Q. farnetto* (Figs 10a-c).

coriarius (HARTIG, 1843) – Synonyms: *Cynips coriaria* HARTIG, 1843; *Adleria coriaria*: ROHWER & FAGAN 1917, *Andricus coriaria*: BENSON 1953. – KIEFFER (1897–1901) described a new variety, *Cynips coriarius* var. *lusitanicus*. DALLA TORRE & KIEFFER (1910) named the typical form as *Cynips coriaria* var. *coriaria*. However, the morphology of galls and adults does not differ. The clearest difference between the two varieties mentioned in the literature is the emerging period of adults: *Andricus coriarius* var. *coriarius* emerges only next year in June, while *A. c.* var. *lusitanicus* – in December–February of the same year (KIEFFER 1897–1901, TAVARES 1931, VASSILEVA-SAMNALIEVA 1985) and even in March in the North-East of the Iberian Peninsula (PUJADE-VILLAR 1991). However, it is well known for many species of oak cynipid wasps that part of the population emerges in late fall–winter, while the rest of the population overwinter in the galls and emerge only next year. So, we consider *Cynips coriarius* var. *lusitanicus* KIEFFER, 1897–1901 as a **syn. n.** of *A. coriarius*. – Only the unisexual generation is known to induce galls on lateral buds, less frequently on terminal buds on *Q. petraea*, *Q. pubescens*, *Q. robur*, and *Q. farnetto* (Figs 11a-b).

coronatus (GIRAUD, 1859) – Synonyms: *Cynips glutinosa* forma *coronata* GIRAUD, 1859, *Cynips coronaria* STEFANI, 1898, *Cynips coronata*: KIEFFER 1897–1901, *Adleria coronata*: ROHWER & FAGAN 1917, *Andricus coronata*: BENSON 1953. – Only the unisexual generation is known to induce lateral bud galls, more frequently on the second year's shoots on *Q. petraea*, *Q. pubescens*, *Q. robur*, and *Q. farnetto* (Figs 12a-d).

corruptrix (SCHLECHTENDAL, 1870) – Synonyms: *Cynips corruptrix* SCHLECHTENDAL, 1870, *Adleria corruptrix*: ROHWER & FAGAN 1917, *Andricus corruptrix*: BENSON 1953 – Only the unisexual generation is known to induce small bud galls on *Q. cerris*. DOCTERS VAN LEEUWEN & DEKHUIJZEN-MAASLAND (1958) mentioned a new form named “*larshemi*” as the bisexual generation of *Andricus corruptrix* after an erroneous experimentation (FOLLIOT *et al.* 2000). The experimental material used by DOCTERS VAN LEEUWEN & DEKHUIJZEN-MAASLAND was deposited at the Natural History Museum in Amsterdam, and after revising this material (JP-V) it appeared that these specimens belonged to *Andricus ambiguus*, which for the alternate bisexual generation was recently established experimentally and named “*eliana*” (FOLLIOT *et al.* 2000). Thus, *Andricus larshemi* is a bisexual form which is not related to any known unisexual form (FOLLIOT *et al.* 2000) (Figs 13a-c).

crispator TSCHERK, 1871 – *Andricus adleri* MAYR, 1880 is a **syn. n.** of *A. crispator*. Types of *A. adleri* were examined by GM (NHMV). After examination of types and large series of both species we found no appreciable diagnostic characters either in galls' structure or in the morphology of females and males on the basis of which the two species could be distinguished. *Andricus buyssoni* KIEFFER, 1902 is a **syn. n.** of *A. crispator*. Analysing large series of both species at the NHMV by GM, no appreciable diagnostic characters for the separation of these two species were found. – On the basis of galls' and adults' descriptions, *Andricus zappellai* KIEFFER, 1901 might be a closely related species or also a synonym of *A. crispator*. However, we had no opportunity to examine this species and, thus, its status remain uncertain. – Only the bisexual generation is known to induce leaf galls on

Q. cerris and *Q. ilex* L., but the last host is confused; probably *A. crispator* (= *buyssoni*) was collected from *Q. suber* L. according to our knowledge of Palearctic Cynipini (Figs 14a-d).

cryptobius WACHTL, 1880 – Only the bisexual generation is known to induce bud galls on *Q. cerris* (Figs 15a-d).

curvator HARTIG, 1840 – Synonyms: bisexual generation: *Cynips roeselii* DAHLBOM, 1842 (**nomen nudum**), *Spathogaster dimidiatus* SCHENCK, 1863, *Andricus perfoliatus* SCHENCK, 1863, *Andricus inflator*: SCHENCK, 1863 (non HARTIG, 1840), *Cynips curvator*: KALTENBACH 1867; the unisexual generation produces *Cynips collaris* HARTIG, 1840, *Aphilothrix collaris*: MAYR 1870, *Andricus collaris*: MAYR 1882, *Andricus fasciatus* SCHENCK, 1863, *Cynips tegmentorum* SCHLECHTENDAL, 1870, *Cynips fasciata* SCHLECHTENDAL, 1870. – Two subspecies of *A. curvator* were described on the basis of the bisexual generation: *A. curvator axillaris* (HARTIG, 1840) from Germany and *A. curvator lusitanicus* KIEFFER, 1897–1901 from Spain and Portugal. Both descriptions of adults are only very slightly different from that of *A. curvator*. Examination of large series of *A. curvator* adults, collected by authors in Central Europe and particularly in Hungary, showed that some morphological characters strongly vary and, thus, characters given as diagnostic for both subspecies, *A. c. axillaris* and *A. c. lusitanicus*, are of no diagnostic value (including the variation in the number of antennal flagellomeres (PUJADE-VILLAR 1991), so we consider *Andricus curvator axillaris* (HARTIG) and *A. curvator lusitanicus* KIEFFER as a **syn. n.** of *Andricus curvator*. – Alternate uni- and bisexual generations are known. The unisexual generation induces integral leaf galls (Figs 16d-e), bisexual generation: bud galls on *Q. petraea*, *Q. pubescens*, *Q. robur*, *Q. cerris*, and *Q. farnetto* (Figs 16a-c).

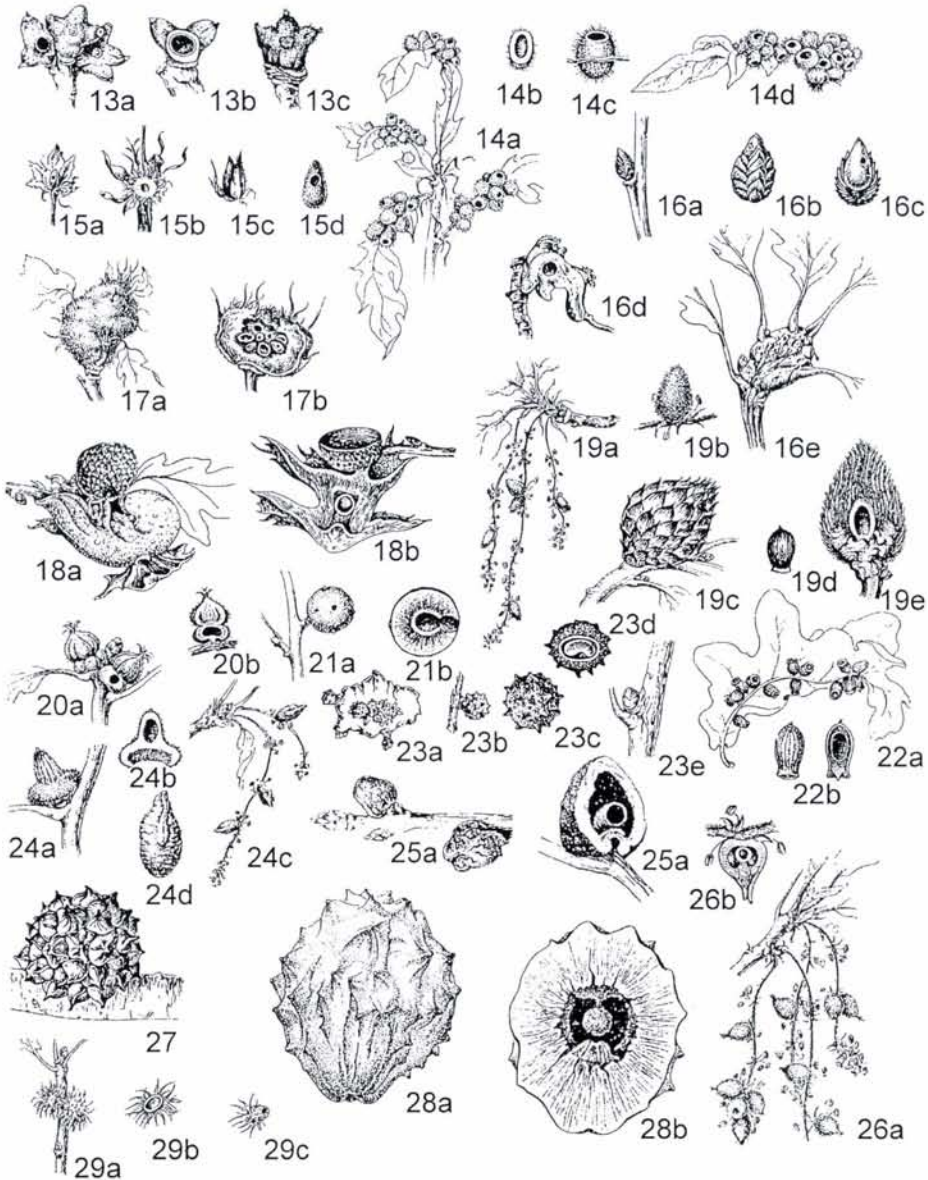
cydoniae GIRAUD, 1859 – Synonyms: *Cynips (A.) cydoniae*: KALTENBACH 1867. – Only the bisexual generation is known to induce galls at the tip of shoots on *Q. cerris* (Figs 17a-b).

dentimitratus REJTŐ, 1887 – Synonyms: *Diplolepis unbraculus* (part) OLIVIER, 1791, *Diplolepis gallae umbraculatae* (part) ANTHOINE, 1794, *Diplolepis quadrum* (error, non FABRICIUS): BERTOLONI 1873, *Cynips gallae viscosae* (part) FAIRMAIRE, 1882; *Cynips glutinosa* GIRAUD var. *dentimitrata* REJTŐ, 1887; *Cynips viscosae* (FAIRMAIRE): DALLA TORRE 1893, *Cynips mayri* KIEFFER, 1897; *Adleria mayri*: ROHWER & FAGAN 1917, *Cynips dentimitrata*: BALÁS 1941, *Andricus mayri*: BENSON 1953; *Andricus viscosus* NIEVES ALDREY, 1986 (MELIKA & CSÓKA 1998); *Andricus gallaeviscosus*: BENSON 1953. PUJADE-VILLAR, MELIKA & CSÓKA (2000, in print) proposed *A. dentimitratus* as a valid name for this species. – Only the unisexual generation is known to induce galls on acorns on *Q. robur*, *Q. petraea*, and *Q. pubescens* (Figs 18a-b).

fecundator (HARTIG, 1840) – Synonyms: unisexual generation: *Cynips quercus gemmae* LINNAEUS, 1758, *Cynips gemmae quercus* GLEDITSCH, 1774, *Cynips gemmae cinaraeformis* CHRIST, 1791, *Cynips fecundatrix* HARTIG, 1840, *Aphilothrix fecundatrix*: ADLER 1881, *Cynips gemmae* SCHENCK, 1863, *Aulax fecundatrix*: GIRAUD 1868, *Neuroterus gemmarum*: WACHTL 1876, *Andricus fecundatrix*: MAYR 1882, *Andricus foecundator*: TAVARES 1918; bisexual generation: *Andricus pilosus* ADLER, 1881. – Alternate uni- and bisexual generations are known (ADLER 1881). The unisexual generation induces galls on catkins (Figs 19a-b), the bisexual generation: galls on lateral and apical buds of the previous year's shoots on *Q. petraea*, *Q. pubescens*, *Q. robur*, and *Q. farnetto* (Figs 19c-e).

galeatus (GIRAUD, 1859) – Synonyms: *Cynips galeata* GIRAUD, 1859, *Adleria galeata*: ROHWER & FAGAN 1917, *Andricus galeata*: BENSON 1953. – Only the unisexual generation is known to induce bud galls at the tips of shoots on *Q. petraea*, *Q. pubescens*, *Q. robur*, and *Q. farnetto* (Figs 20a-b).

gallaetinctoriae (OLIVIER, 1791) – Synonyms: *Diplolepis gallae-tinctoriae* OLIVIER, 1791. – Alternate uni- and bisexual generations are known. The unisexual generation induces catkin galls on



Figs 13–29. Oak galls. 13a–c: *A. corruptrix*. 14a–d: *A. crispator*. 15a–d: *A. cryptobius*. 16: *A. curvator*: a–c = unisex. gen., d–e = bisex. gen. 17a–b: *A. cydoniae*. 18a–b: *A. dentimitratus*. 19: *A. fecundator*: a–b = bisex. gen., c–e = unisex. gen. 20a–b: *A. galeatus*. 21a–b: *A. gallaetinctoriae*, unisex. gen. 22a–b: *A. gallaeurnaeformis*. 23: *A. gemmeus*: a–d = unisex. gen., e = bisex. gen. 24: *A. glandulae*: a–b = unisex. gen., c–d = bisex. gen. 25a–b: *A. glutinosus*. 26a–b: *A. grossulariae*. 27: *A. hartigi*. 28a–b: *A. hungaricus*. 29a–c: *A. hystrix*

Q. cerris only, bisexual generation: bud galls on *Q. petraea*, *Q. pubescens*, *Q. robur*, and *Q. farnetto* (Figs 21a-b).

gallaeurnaeformis (BOYER DE FONSCOLOMBE, 1832) – Synonyms: unisexual generation: *Diplolepis gallae urnaeformis* BOYER DE FONSCOLOMBE, 1832, *Cynips urnaeformis*: GIRAUD 1859, *Andricus urnaeformis*: MAYR 1871, *Andricus gallae-urnaeformis*: DALLA TORRE & KIEFFER 1910; bisexual generation: *Andricus sufflator* MAYR, 1882. – Alternate uni- and bisexual generations were established experimentally (FOLLIO 1964). MAYR (1882) proposed this relationship earlier, however, without experimentation. Both generations induce leaf galls on *Q. petraea*, *Q. pubescens*, *Q. robur*, and *Q. farnetto* (Figs 22a-b).

gemmeus (GIRAUD, 1859) – Synonyms: unisexual generation: *Cynips gemmea* GIRAUD, 1859, *Aphilothrix kirschbergi* WACHTL, 1876, *Andricus kirschbergi*: MAYR 1882, *Andricus gemmae*: DALLA TORRE & KIEFFER 1910. – Alternate uni- and bisexual generations are known; the bisexual generation was found experimentally by PFÜTZENREITER (1962) but he did not name this form. Both generations induce galls on the bark, on the accessory buds; galls of the unisexual generation (Figs 23e) develop on *Q. petraea*, *Q. pubescens*, and *Q. robur*, while galls of the bisexual generation on *Q. cerris* only (Fig. 23a-d).

glandulae (HARTIG, 1840) – Synonyms: unisexual generation: *Cynips glandulae* HARTIG, 1840, *Aphilothrix glandulae*: MAYR 1870, *Andricus glandulae*: MAYR 1882; bisexual generation: *Andricus xanthopsis* SCHLECHTENDAL, 1884. – Some authors instead of HARTIG used SCHENCK as the author of this species, who for the first time described the adult wasp (IONESCU 1973, AMBRUS 1974a). However, according to the International Code of Zoological Nomenclature, species described on the basis of the gall only before 1931 are also valid. Thus, HARTIG (1840) who first described the gall, is the author of this species. – Alternate uni- and bisexual generations are known. The bisexual generation induces galls which are normally located in leaf axils (Figs 24c-d), the unisexual generation causes catkin galls on *Q. petraea* and *Q. pubescens*, less frequently on *Q. robur* (Figs 24a-b). Only the unisexual generation is known from Hungary.

glutinosus (GIRAUD, 1859) – Synonyms: *Cynips glutinosa* GIRAUD, 1859, *Adleria glutinosa*: ROHWER & FAGAN 1917, *Andricus glutinosa*: BENSON 1953. – Only the unisexual generation is known to induce bud galls on the previous year's shoots on *Q. petraea*, *Q. pubescens*, *Q. robur*, and *Q. farnetto* (Figs 25a-b).

grossulariae GIRAUD, 1859 – Synonyms: *Cynips grossulariae*: KALTENBACH 1867. – Only the bisexual generation is known to induce catkin galls on *Q. cerris* (Figs 26a-b).

hartigi (HARTIG, 1843) – Synonyms: *Cynips Hartigii* (lapsus!) KOLLAR (in litt.) HARTIG, 1843, *Adleria hartigi*: ROHWER & FAGAN 1917, *Andricus hartigi*: BENSON 1953. Some researchers (AMBRUS 1974a) erroneously named MARSCHALL as the author of this species who described *Andricus hartigi* (MARSCHALL 1867) which appeared to be a synonym of *Diastrophus rubi* (BOUCHÉ 1834). – Only the unisexual generation is known to induce galls on accessory buds on the trunk or on the inner side of a thick branch on *Q. petraea*, *Q. pubescens*, *Q. robur*, and *Q. farnetto* (Fig. 27).

hungaricus (HARTIG, 1843) – Synonyms: *Cynips hungarica* HARTIG, 1843, *Adleria hungarica*: ROHWER & FAGAN, 1917, *Andricus hungaricus*: BENSON 1953. – Only the unisexual generation is known to induce bud galls on the previous year's shoots on *Q. robur* (Figs 28a-b). AMBRUS (1974a), IONESCU (1973) and VASSILEVA-SAMNALIEVA (1985) mentioned also *Q. pubescens* as a host plant. We doubt it, because we never found this species on other oaks than on *Q. robur*. So, this data must be confirmed.

hystrix KIEFFER, 1897 – Many authors, beginning from DALLA TORRE & KIEFFER (1910) and even earlier, erroneously named TROTTER as the author of this species. However, KIEFFER (1897–1901) was the first who published this name using TROTTER's information. – Only the unisex-

ual generation was known to induce galls on axillar buds on young shrubs or regrowth shoots close to the ground on *Q. petraea*, *Q. pubescens*, and *Q. robur* (Figs 29a-c). Recently, FOLLIOU (pers. com.) experimentally obtained the bisexual generation, which we named as *Andricus hystrix* KIEFFER *follioti*, new form.

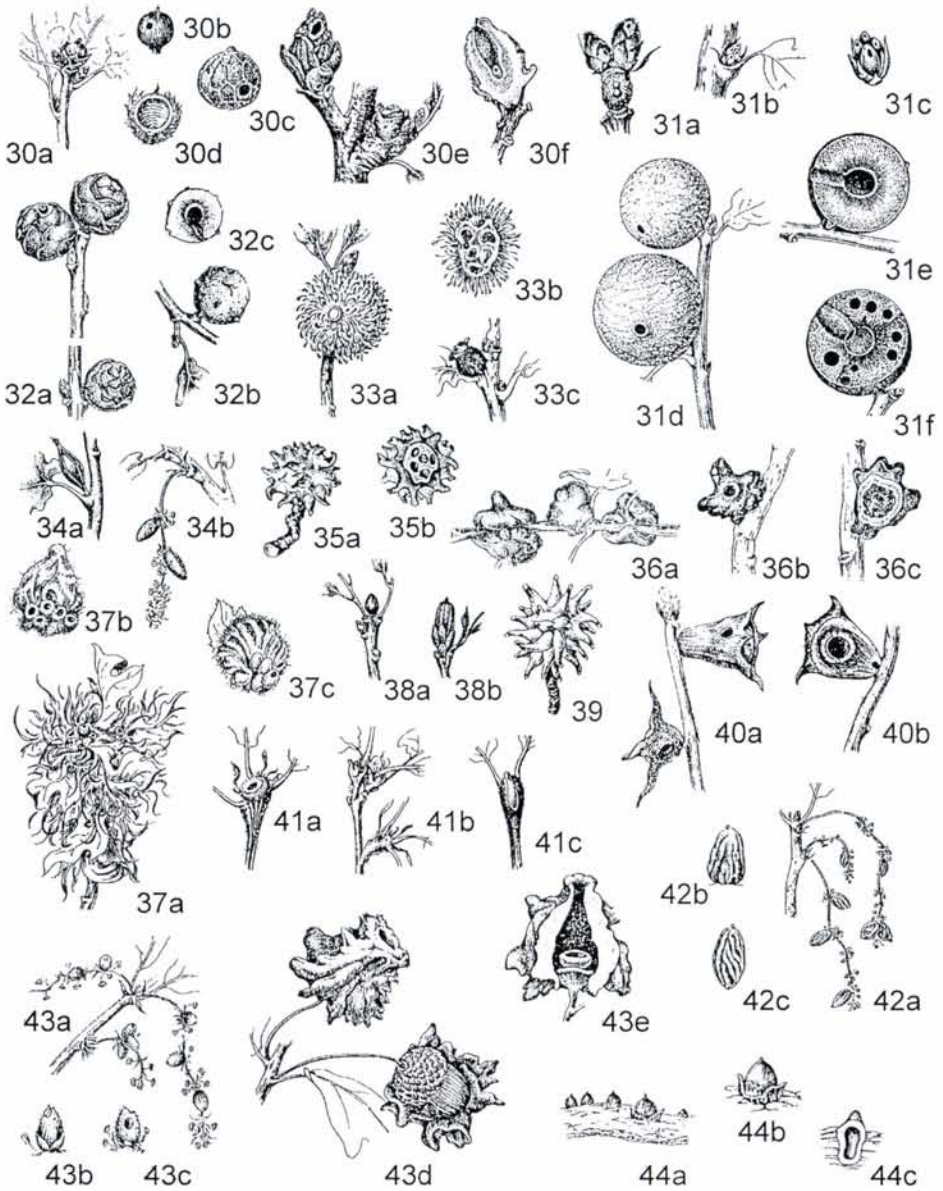
infectorius (HARTIG, 1843), **comb. n.** – Synonyms: *Cynips infectoria* HARTIG, 1843, *Cynips tinctoria nostras* STEFANI, 1886, nomen nudum, *Cynips tinctoria* var. *nostra* KIEFFER 1900–01, *Andricus infectoria*: BENSON 1953. – According to DALLA TORRE & KIEFFER (1910) the valid name of this species is *Andricus infectoria* (HARTIG). However, another name, *A. tinctoriusnostrus* STEFANI has been used by several authors (AMBRUS 1974). STEFANI (1886) gave another name for this species, *Cynips tinctoria* var. *nostras*, while stated that it differs from *C. tinctoria* but without accompanying this statement with description and/or drawing. KIEFFER (1897–1901) gave the first description of this variety and if we consider it as a species, or, in other words, elevate it to species level, then the valid name must be *Andricus nostrus* (STEFANI). Thus, *Cynips tinctoria nostras* STEFANI must be considered as **nomen nudum**. – BEJERINCK (in DALLA TORRE & KIEFFER 1910) proposed *Andricus burgundus* GIRAUD as the bisexual generation of *A. tinctoriusnostrus* (STEFANI) and later a number of researchers followed it (BUHR 1965, AMBRUS 1974a, KIERZYCH 1979). However, later the bisexual generation was found and it appeared that *A. burgundus* was a separate species. – Alternate unisexual and bisexual generations are known. The bisexual generation induces catkin galls on *Q. cerris* only, while the unisexual generation induces bud galls on *Q. petraea*, *Q. pubescens*, *Q. robur*, and *Q. farnetto*. The bisexual adults emerge in mid-May, the unisexual galls mature in October, the adults overwinter in galls and emerge following spring (Figs 58a-b – bisex. gen., 58c-d – unisex. gen.).

inflator HARTIG, 1840 – Synonyms: unisexual generation: *Cynips inflator* RATZEBURG, 1844; bisexual generation: *Cynips globuli* HARTIG, 1840, *Aphilothrix globuli*: MAYR 1870, *Andricus globuli*: MAYR 1882. – Alternate uni- and bisexual generations are known (ADLER 1881). The bisexual generation induces galls on either apical or lateral buds of young shoots (Figs 30a-d), the unisexual generation produces on shoot tip, sometimes on leaf petiole or the shoot behind the tip on *Q. petraea*, *Q. pubescens*, *Q. robur*, and *Q. farnetto* (Figs 30e-f).

kollari (HARTIG, 1843) – Synonyms: unisexual generation: *Cynips quercus gemmae* CHRIST, 1791, *Cynips Kollarii* HARTIG, 1843; bisexual generation: *Andricus circulans* MAYR, 1870. – KIEFFER (1897–1901) described a new variety, *Cynips kollari* var. *minor*, the gall of which has more than one larval chamber what is unusual for the unisexual galls of *A. kollari*. However, very often galls of *A. kollari* are attacked by inquiline cynipid wasps of the genus *Synergus* HARTIG, larvae of which also form a larval chamber. Probably, KIEFFER erroneously took the larval chambers of inquilines as those of gall-inducer. Thus, *A. kollari* var. *minor* is a **syn. n.** of *A. kollari*. – Alternate uni- and bisexual generations are known. The bisexual generation induces galls on the apical buds, and less frequently on lateral buds on *Q. petraea*, *Q. robur*, and *Q. farnetto*; less frequently on *Q. pubescens* (Figs 31d-f). The unisexual generation induces small tiny galls on the apical buds on *Q. cerris* only (Figs 31a-c).

legitimus WIEBES-RIJKS, 1980 – Synonyms: *Andricus glandium* (GIRAUD) DU BUYSSON, 1900 (non GIRAUD, 1859) and other misidentifications (WIEBES-RIJKS 1980). – Only the unisexual generation is known to induce inner galls in acorns on *Q. robur*, like the unisexual galls of *Callirhytis glandium* (GIRAUD, 1859).

lignicolus (HARTIG, 1840) – Synonyms: unisexual generation: *Cynips lignicola* HARTIG, 1840, *Adleria lignicola*: ROHWER & FAGAN 1917, *Andricus lignicola*: BENSON 1953; bisexual generation: *Andricus lignicola* HARTIG var. *vanheurni* DOCTEURS VAN LEEUWEN & DEKHUIJZEN-MAASLAND, 1958. – Alternate uni- and bisexual generations are known (DOCTEURS VAN LEEUWEN & DEKHUIJZEN-MAASLAND 1958). Both forms induce bud galls. The gall of the bi-



Figs 30–44. Oak galls. 30: *A. inflator*: a–d = unisex. gen., e–f = bisex. gen. 31: *A. kollari*: a–c = bisex. gen., d–f = unisex. gen. 32a–c: *A. lignicolus*. 33a–c: *A. lucidus*. 34: *A. malpighi* (= *nudus*): a = unisex. gen., b = bisex. gen. 35a–b: *A. mayri*. 36a–c: *A. mitratus*. 37a–c: *A. multiplicatus*. 38a–b: *A. paradoxus*. 39: *A. picta* (= *panteli* KIEFFER). 40a–b: *A. polycerus*. 41a–c: *A. pseudoinflator*, bisex. gen. 42a–c: *A. quadrilineatus*. 43: *A. quercuscalicis*: a–c = bisex. gen., d–e = unisex. gen. 44a–c: *A. quercuscorticis*, unisex. gen.

sexual generation is associated with *Q. cerris* only, while the gall of the unisexual generation develops on *Q. petraea*, *Q. pubescens*, *Q. robur* and *Q. farnetto* (Figs 32a-c).

lucidus (HARTIG, 1843) – Synonyms: *Cynips lucida* HARTIG, 1843, *Aphilothrix lucida*: MAYR 1870, *Andricus lucidus*: MAYR 1882, *Adleria lucidus*: ROHWER & FAGAN 1917. – KIEFFER (1897–1901) described a subspecies, *A. lucidus erinaceus*, which has similar but smaller galls. It is impossible to distinguish females of *A. lucidus erinaceus* from *A. lucidus* on the basis of characters given in the original description (KIEFFER 1897–1901) including the variation in the number of antennal flagellomeres. Moreover, on the same tree *A. lucidus* galls of normal and much smaller sizes can be found. We consider, *Andricus lucidus erinaceus* as a **syn. n.** of *A. lucidus*. – Only the unisexual generation is known to induce galls on buds, occasionally on acorns on *Q. petraea*, *Q. pubescens*, *Q. robur*, and *Q. farnetto* (Figs 33a-c).

malpighii (ADLER, 1881) – Synonyms: unisexual generation: *Aphilothrix malpighii* ADLER, 1881 *Andricus malpighii*: MAYR 1882; bisexual generation: *Andricus nudus* ADLER, 1881. – Earlier, the valid name of this species was *Andricus nudus*. Recently, PUJADE-VILLAR & MELIKA (2000, in print) changed the valid name of this species to *Andricus malpighii*. – Alternate uni- and bisexual generations are known (ADLER 1881). The bisexual generation induces galls on lateral buds or at the tip of summer shoots (Fig. 34b), the unisexual generation produces catkin galls, mainly on *Q. petraea* and *Q. robur*, rarely on *Q. pubescens* (Fig. 34a).

mayri (WACHTL, 1879) – Synonyms: *Aphilothrix mayri* WACHTL, 1879, *Andricus mayri*: MAYR 1882. – According to the original description of *Andricus mayri*, this species induces galls on oak catkins and is distributed in Central Europe. KIEFFER (1897–1901) described a similar species (*Andricus panteli*) with a circummediterranean distribution. *Andricus panteli* (KIEFFER) adults and galls are larger in size, and galls develop in buds. TROTTER (1899) described a variety, *Andricus panteli* var. *fructuum*, the gall of which develops on acorn cups, later DALLA TORRE & KIEFFER (1910) considered this variety as a subspecies of *Andricus panteli*. TAVARES (1922) thought *Andricus panteli* as a subspecies of *Andricus mayri* (*Andricus mayri panteli*) and described a new subspecies (*Andricus mayri intermedius*). According to the examined Hungarian material (GM & GC) *A. mayri* induces galls on acorns and/or catkins on *Q. petraea*, *Q. robur*, *Q. pubescens*, and *Q. farnetto* while in the Iberian Peninsula (JP-V) galls develop in buds and rarely in acorns (never on catkins). Probably all these forms are the same species but the peculiarities of *Andricus* unisexual forms make us cautious and we consider the Central European form, *Andricus mayri* (WACHTL) and the Circummediterranean form, *Andricus panteli* KIEFFER as different species until their life cycles will be closed. Thus, the next subspecies are synonyms of *A. panteli*: *Andricus panteli* var. *fructuum* TROTTER, 1899, **syn. n.**, *Andricus panteli panteli* DALLA TORRE & KIEFFER, 1910, **syn. n.**, *Andricus mayri panteli* TAVARES, 1922, **syn. n.**, *Andricus mayri intermedius* TAVARES, 1902, **syn. n.** – Only the unisexual generation is known (Figs 35a-b).

mitratus (MAYR, 1870) – Synonyms: *Cynips glutinosa* var. *mitrata* MAYR, 1870, *Cynips mitrata*: KIEFFER 1897–1901, *Adleria mitrata*: ROHWER & FAGAN 1917, *Andricus mitrata*: BENSON 1953. – Only the unisexual generation is known to induce galls on lateral buds of shoots on *Q. petraea*, and *Q. pubescens*, rarely on *Q. robur* (Figs 36a-c).

multiplicatus GIRAUD, 1859. – Only the bisexual generation is known to induce bud galls, usually at shoot tips on *Q. cerris* only (Figs 37a-c).

paradoxus (RADOSZKOWSKI, 1866) – Synonyms: unisexual generation: *Cynips gallae triticiformis* ANTHOINE, 1794, *Manderstjernia paradoxa* RADOSZKOWSKI, 1866, *Andricus paradoxus*: BUHR 1965, *Cynips majalis* GIRAUD, 1868 (non BASSET, 1864), *Cynips albopunctata* SCHLECHTENDAL, 1870, *Aphilothrix albopunctata*: MAYR 1870, *Cynips albipuncta*: KALTENBACH 1874; bisexual generation: *Andricus albopunctatus* forma *barbotini* FOLLIOU, 1964. – *Andricus Lambertoni* KIEFFER, 1897 is a **syn. n.** GM examined the type of *A. lambertoni* loaned from MNHP.

Holotype female "Andricus Lambertoni", "Museum Paris 1957, coll. KIEFFER", handwriting label "Andricus lambertoni K." and a red label "Holotype". Type locality is Bitche (Lorraine, France). We were unable to find appreciable diagnostic characters for separation *A. lambertoni* from *A. paradoxus* (= *albopunctatus*) and consider it as a **syn. n.** of *A. paradoxus*. – Alternate bisexual and unisexual generations are known (FOLLIOU 1964). The unisexual generation induces catkin galls, bisexual generation: galls on buds of previous year's shoots on *Q. petraea*, *Q. pubescens*, and *Q. robur* (Figs 38a-b).

picta (HARTIG, 1856) – Synonyms: *Cynips picta* HARTIG, 1856; *Cynips panteli* KIEFFER, 1901, *Cynips panteli* TAVARES, 1902; *Adleria picta*: ROHWER & FAGAN 1917, *Andricus picta*: BENSON 1953, *Adleria panteli*: ROHWER & FAGAN 1917, *Andricus panteli*: BENSON 1953; *Andricus broteriae* PUJADE-VILLAR & BACHMANN, 1999. PUJADE-VILLAR & BACHMANN (1999) proposed this name for *Andricus panteli* (KIEFFER, 1901) (= *Cynips panteli* TAVARES, 1902) because the two last names are secondary homonyms of *Andricus mayri* (WACHTL, 1879) (= *A. panteli* KIEFFER, 1897) but recently, after studying material collected by HARTIG in Sierra de Ronda (Spain) this name was considered as a synonym of *Cynips picta* HARTIG (PUJADE-VILLAR & BELLIDO 2000). – Only the unisexual generation is known to induce galls on lateral buds on *Q. robur*, *Q. petraea*, *Q. pubescens*, and *Q. farnetto* (Fig. 39).

polycerus (GIRAUD, 1859) – Synonyms: *Cynips polycera* var. *transversa* KIEFFER, 1897, *Adleria polycera*: ROHWER & FAGAN 1917, *Andricus polycerus*: BENSON 1953. – Only the unisexual generation is known to induce bud galls on *Q. petraea*, *Q. pubescens*, *Q. robur*, and *Q. farnetto* (Figs 40a-b).

pseudoinflator TAVARES, 1901 – This species very closely related to *A. inflator*. Unisexual female differs from *A. inflator* by mesonotum which is more pubescent and with finer reticulation, with 13-segmented antenna; and entire body reddish. Bisexual female differs from *A. inflator* by the less pubescent body, lighter colouration; the male scutum more alutaceous, shiny, glabrous; OOL nearly 2.0 times as long as diameter of lateral ocellus. When the gall of *A. pseudoinflator* develops on *Q. robur*, it cannot be distinguished from *A. inflator*. The unisexual gall shaped as in *A. inflator*, just smaller sized. Some researchers (KIERZYCH 1979) are not sure about the status of this species, like the authors of this paper. It is possible that *A. pseudoinflator* is a synonym of *A. inflator*. Types of these two species must be examined in order to make this decision. PUJADE-VILLAR (1993) experimentally proved that *Andricus bocagei* TAVARES, 1902 is the alternate bisexual generation of *A. pseudoinflator*. – Alternate uni- and bisexual generations are known, both induce bud galls on *Q. pubescens*, *Q. petraea*, and *Q. robur* (Figs 41a-c).

quadrilineatus HARTIG, 1840 – Synonyms: unisexual generation: *Andricus glabriusculus* SCHENCK, 1863, *Andricus pedunculi* SCHENCK, 1863, *Andricus verrucosus* SCHENCK, 1863, *Andricus ambiguus* SCHENCK, 1863, *Andricus marginalis* SCHLECHTENDAL, 1870, *Cynips 4-lineata*: THOMSON 1877; *Aphilothrix marginalis*: ADLER 1881, *Andricus marginalis*: MAYR 1881; bisexual generation: *Andricus Kiefferi* PIGEOT, 1900. – Alternate uni- and bisexual generations are known (FOLLIOU 1961). The unisexual generation induces catkin galls, bisexual generation: galls on catkins and young leaves on *Q. petraea*, *Q. robur*, and *Q. pubescens* (Figs 42a-c).

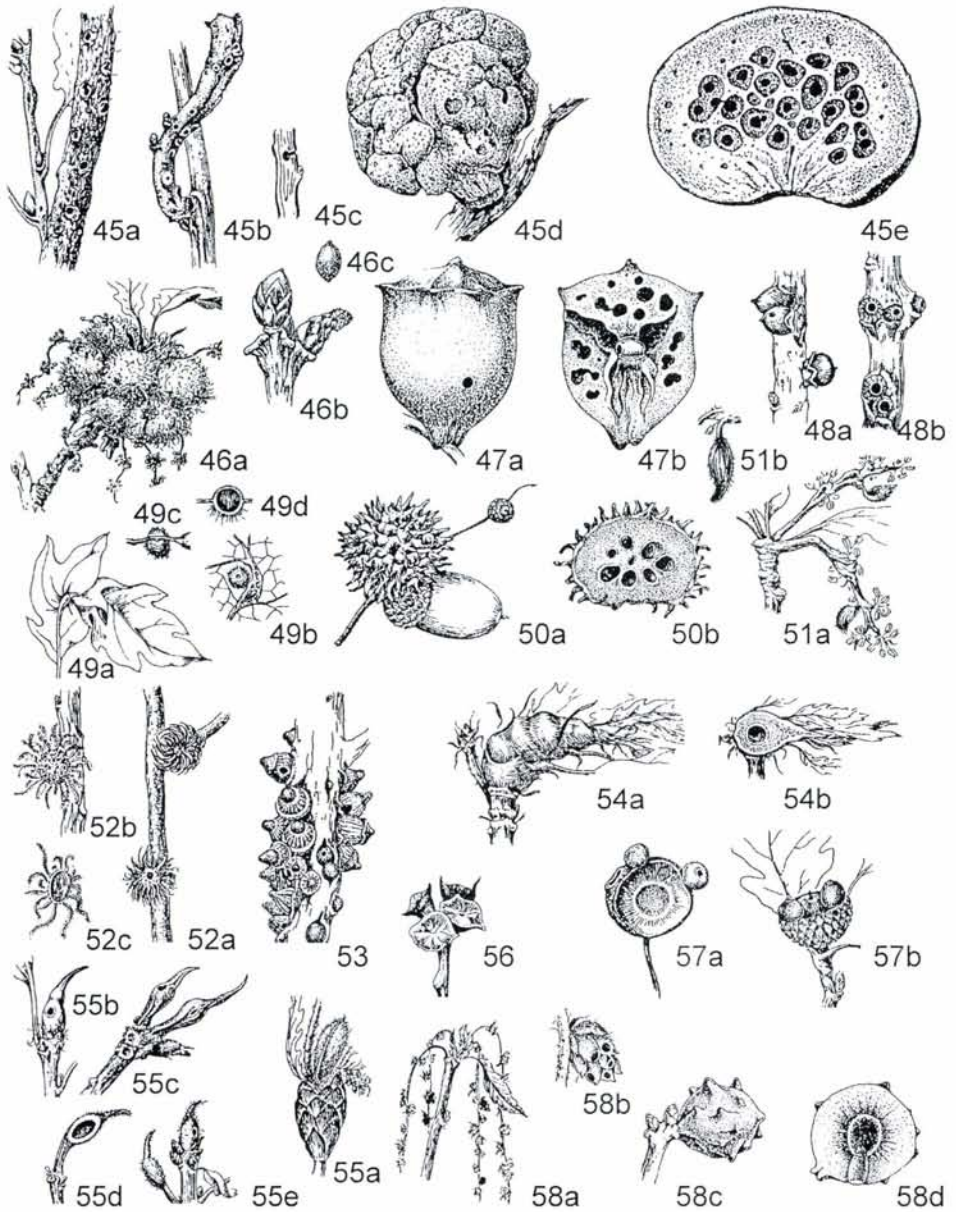
quercuscalicis (BURGSDORF, 1783) – Synonyms: unisexual generation: *Cynips quercuscalicis* BURGSDORF, 1783, *Adleria quercuscalicis*: ROHWER & FAGAN 1917, *Andricus quercuscalicis*: BENSON 1953; bisexual generation: *Andricus cerri* BEYERINCK, 1896. – *Andricus beyerincki* TROTTER, 1899 is a **syn. n.** In the NHMV GM examined 8 wasps and two pins with galls of *Andricus beyerincki*. Two pins with one female and one male labelled as "Collect. G. Mayr", "Andr. Beyerincki, det. Trotter, Type", all other pins are with Mayr's determination labels and, probably do not originate from Trotter's original type series. The galls are labelled as "A. beyerinckii Trotter, Type". Galls are indistinguishable from those of the bisexual galls of *A. quercuscalicis*. AMBRUS (1974a) mentioned that only the analysis of adults could determine whether this was a dis-

tinct species or a synonym of *A. quercuscalicis*. KIEFFER (1897–1901), DALLA TORRE & KIEFFER (1910) treated *A. beyerincki* as a distinct species. In DALLA TORRE & KIEFFER (1910) *A. beyerincki* and *A. quercuscalicis* (= *cerri*) are keyed out in different couplets – central portion of the propodeum of *A. beyerincki* with bent lateral carinae, while in *A. quercuscalicis* propodeal lateral carinae are parallel. However, examination of large series of specimens of both species showed that the propodeal lateral carinae in *A. quercuscalicis* are bent in the same way as in *A. beyerincki*. We found no other morphological characters on the basis of which these two species can be distinguished and, thus, *A. beyerincki* is a **syn. n.** of *A. quercuscalicis*. – Alternate uni- and bisexual generations are known (BEYERINCK 1897). The unisexual generation induces catkin galls on *Q. cerris* (Figs 43a-c); bisexual generation: acorn galls on *Q. robur* (Figs 43d-e). AMBRUS (1974a) mentioned the unisexual galls from *Q. petraea* and *Q. pubescens*. However, these records must be confirmed.

quercuscorticis (LINNAEUS, 1761) – Synonyms: unisexual generation: *Cynips quercus corticis* LINNAEUS, 1761, *Cynips corticis*: HARTIG 1840, *Aphilothrix corticis*: FOERSTER 1869, *Andricus corticis*: MAYR 1882, *Andricus quercus-corticis*: DALLA TORRE & KIEFFER 1910, *Andricus quercuscorticis*: BENSON, 1953, *Andricus krajnovici* TAVARES, 1901 (PUJADE-VILLAR & ROS-FARRÉ 2000, in print); bisexual generation: *Andricus gemmatu* ADLER, 1881, *Neuroterus brevicornis* HARTIG, 1841 (PUJADE-VILLAR & ROS-FARRÉ 2000, in print). In the NHMV we found one female of *A. krajnovici*, labelled as “Port. Coll. G. Mayr”, “A. Krajnovici, det. Tav. Type” and a handwritten label “Typ. Tavar. 902”. Tavares’ collection was destroyed and supposedly this specimen originated from the type series. GM designated this specimen as a lectotype of *A. krajnovici*. NIEVES-ALDREY (1983) mentioned that the scutum of *A. krajnovici* is more pubescent and punctuated than in the unisexual females of *A. quercuscorticis*. However, examination of the *A. krajnovici* type and a large series of the unisexual *A. quercuscorticis* showed us no significant differences between two species, thus, we consider *A. krajnovici* as a synonym of *A. quercuscorticis*. – Alternate uni- and bisexual generations are known (ADLER 1881, FOLLIOU 1964). The bisexual generation induces galls on the bark of shoots (Figs 44a-c), the unisexual generation produces galls on leaf axils or among clustered buds on *Q. petraea*, *Q. pubescens*, *Q. robur*, and *Q. cerris*.

quercusradicis (FABRICIUS, 1798) – Synonyms: unisexual generation: *Cynips quercus radicis* FABRICIUS, 1798, *Cynips radicis*: HARTIG 1841, *Aphilothrix radicis*: MAYR 1870, *Andricus radicis*: MAYR 1882, *Andricus quercusradicis*: DALLA TORRE & KIEFFER 1910; bisexual generation: *Andricus trilineatus* HARTIG, 1840, *Andricus noduli* HARTIG, 1840, *Neuroterus parasiticus* HARTIG, 1841 (PUJADE-VILLAR & ROS-FARRÉ 1999, in print.), *Cynips noduli*: KALTENBACH 1867, *Andricus trilineatus* var. *beirensis* TAVARES, 1902 (PUJADE-VILLAR & ROS-FARRÉ 1999, in print), *Andricus quercusradicis* var. *beirensis*: DALLA TORRE & KIEFFER 1910. – Alternate uni- and bisexual generations are known (ADLER 1881, FOLLIOU 1964). The bisexual generation induces root galls on all oaks, except *Q. cerris* (Figs 45d-e); the unisexual generation produces galls on bark of shoot, leaf petiole or midrib on all oaks, most frequently on *Q. cerris* (Figs 45a-c).

quercusramuli (LINNAEUS, 1761) – Synonyms: unisexual generation: *Cynips autumnalis* HARTIG, 1840, *Aphilothrix autumnalis*: MAYR 1870, *Andricus autumnalis*: MAYR 1882; bisexual generation: *Cynips quercus ramuli* LINNAEUS, 1761, *Andricus ramuli*: SCHENCK 1863, *Andricus quercusramuli*: DALLA TORRE & KIEFFER 1910, *Teras amentorum* HARTIG, 1843, *Andricus amentorum*: SCHENCK 1863. – KIEFFER (1899) described a new variety, *Andricus ramuli* var. *trifasciata* KIEFFER from the Iberian Peninsula, characterized by 14-segmented antenna in males, with bent propodeal carinae and different colouration in both sexes. Later, this variety was erected to subspecies level (DALLA TORRE & KIEFFER 1910). Probably this subspecies could be identical with *A. quercusramuli quercusramuli*, but the unisexual form (*‘autumnalis’*) has never been collected on the Iberian Peninsula. For this reason we think it is better to respect this subspecific denomination because an occurrence of a sibling species on the Iberian Peninsula is possible. – Alternate uni- and bi-



Figs 45–58. Oak galls. 45: *A. quercusradicis*: a–c = bisex. gen., d–e = unisex. gen. 46: *A. quercusramuli*: a–bisex. gen., b–c = unisex. gen. 47a–b: *A. quercustozae*. 48a–b: *A. rhyzomae*. 49a–d: *A. schroeckingeri*. 50a–b: *A. seckendorffi*. 51a–b: *A. seminatiois*. 52a–c: *A. serotinus*. 53: *A. sieboldi*. 54a–b: *A. singularis*. 55: *A. solitarius*: a = bisex. gen., b–c = unisex. gen. 56: *A. subterranea*. 57a–b: *A. superfetationis*. 58: *A. infectorius*: a–b = bisex. gen., c–d = unisex. gen.

sexual generations are known (ADLER 1881). The bisexual generation induces galls on catkins and male buds (Fig. 46a), the unisexual generation produces galls in buds on *Q. petraea*, *Q. pubescens*, *Q. robur*, and *Q. farnetto*; the bisexual generation can develop on *Q. cerris* as well (Figs 46b-c).

quercustozae (BOSC, 1792) – Synonyms: *Cynips quercus tozae* BOSC, *Cynips quercus tojae* FABRICIUS, 1793, *Cynips argentea* HARTIG, 1843, *Cynips rosenhaueri* HARTIG, 1856, *Aphilothrix tojae*: LICHTENSTEIN 1877, *Cynips tozae*: KIEFFER 1897–1901, *Adleria quercustozae*: ROHWER & FAGAN 1917, *Andricus quercustozae*: BENSON 1953, *Cynips Kiefferi* CABRERA, 1897, *Adleria Kiefferi*: ROHWER & FAGAN 1917, *Andricus Kiefferi*: BENSON 1953 (non PIGEOT, 1900). *Andricus Kiefferi* (CABRERA) was synonymized recently (PUJADE-VILLAR, MELIKA & CSÓKA 2000, in print). – Only the unisexual generation is known to induce bud galls on *Q. petraea*, *Q. pubescens*, *Q. robur*, and *Q. farnetto* (Figs 47a-b).

rhyzomae (HARTIG, 1843) – Synonyms: *Cynips rhyzomae* HARTIG, 1843, *Aphilothrix rhyzomae*: MAYR 1870, *Andricus rhyzomae*: MAYR 1882, *Andricus rhizomatis*: DALLA TORRE 1893. – Only the unisexual generation is known to induce galls on bark on *Q. petraea* and *Q. robur* (Figs 48a-b). A number of researchers (KIEFFER 1897–1901, DOCTERS VAN LEEUWEN 1957, EADY & QUILAN 1963, IONESCU 1973, AMBRUS 1974a) considered *Andricus testaceipes* var. *nodifex* KIEFFER, 1897–1901 as the bisexual generation of *A. rhyzomae*, however, this has not been confirmed yet.

schroeckingeri WACHTL, 1876 – Only the bisexual generation is known to induce leaf galls on *Q. cerris* (Figs 49a-d).

seckendorffi (WACHTL, 1879) – Synonyms: *Aphilothrix seckendorffi* WACHTL, 1879, *Andricus seckendorffi*: MAYR 1882; *Andricus magretti* KIEFFER, 1897 (MELIKA 1999). – Only the unisexual generation is known to induce galls on acorn cups on *Q. petraea*, *Q. pubescens*, and *Q. robur* (Figs 50a-b).

seminationis (GIRAUD, 1859) – Synonyms: *Aphilothrix seminationis*: ADLER 1881, *Andricus seminationis*: MAYR 1882; *Cynips inflorescentiae* SCHLECHTENDAL, 1870. – Only the unisexual generation is known to induce galls on catkins and leaves on *Q. robur*, rarely on *Q. petraea* (Figs 51a-b).

serotinus (GIRAUD, 1859) – Synonyms: *Cynips serotina* GIRAUD, 1859, *Aphilothrix serotina*: MAYR 1870, *Andricus serotinus*: MAYR 1882. – Only the bisexual generation is known to induce bud galls on *Q. petraea*, *Q. robur*, and *Q. pubescens* (Figs 52a-c).

sieboldi (HARTIG, 1843) – Synonyms: unisexual generation: *Cynips quercus corticis* BECHSTEIN & SCHARFENBERG, 1805 (non LINNAEUS, 1761), *Cynips quercus corticalis* HARTIG, 1834, *Cynips corticalis* HARTIG, 1840; *Cynips sieboldi* HARTIG, 1843, *Aphilothrix sieboldi*: MAYR 1870, *Andricus sieboldi*: MAYR 1882; *Cynips ramicola* SCHLECHTENDAL, 1870; bisexual generation: *Andricus sieboldi* forma *poissoni* FOLLIOU, 1964. – DALLA TORRE & KIEFFER (1910), EADY & QUINLAN (1963), BUHR (1965), IONESCU (1973), AMBRUS (1974a) and many others treated this name after ADLER (1881) as the unisexual generation of *Andricus testaceipes* HARTIG, 1840 and, thus, *A. sieboldi* was a synonym of *A. testaceipes*. However, FOLLIOU (1964) experimentally found the bisexual generation of *A. sieboldi* which he named as *Andricus sieboldi* f. *poissoni*. This experimentation was later corroborated by PUJADE-VILLAR (1986). *Andricus testaceipes* HARTIG and its variety *A. testaceipes* var. *nodifex* represent probably the bisexual generation of *A. rhyzomae* (see also *A. rhyzomae*.), however, it must be confirmed. According to this, *Andricus sieboldi* *occidentalis* FOLLIOU, 1964 is not a valid subspecies and together with *Andricus occidentalis* (FOLLIOU) and *Andricus occidentalis* forma *poissoni* (FOLLIOU) (ASKEW 1984) are **syn. n.** of *Andricus sieboldi*. – Alternate uni- and bisexual generations are known (FOLLIOU 1964). The bisexual generation induces galls on roots, the unisexual generation produces galls on leaf midrib on *Q. robur*, *Q. petraea*, and *Q. pubescens* (Fig. 53).

singularis MAYR, 1870, **comb. rev.** Originally MAYR (1870) described this species as *Andricus singularis*. Later, MAYR (1881) gave another name for this species, *Andricus singulus*, because in his opinion, the name '*singularis*' was preoccupied by BASSETT (1863) for *Cynips quercus singularis* described from North America. Soon, OSTEN SACKEN (1865) renamed this species into *Cynips singularis* (BASSETT), but this is an unjustified emendation. The International Code of Zoological Nomenclature does not allow the change made by MAYR (1881) and, thus, here the name *Andricus singularis* MAYR, 1870 is reestablished and *Andricus singulus* MAYR, 1881 is a **syn. n.** of *A. singularis*. Besides, the correct name of the American species described by BASSETT is *Andricus quercussingularis*. – Only the bisexual generation is known to induce small bud galls on *Q. cerris* (Figs 54a-b). AMBRUS (1974a) erroneously gave the unisexual generation.

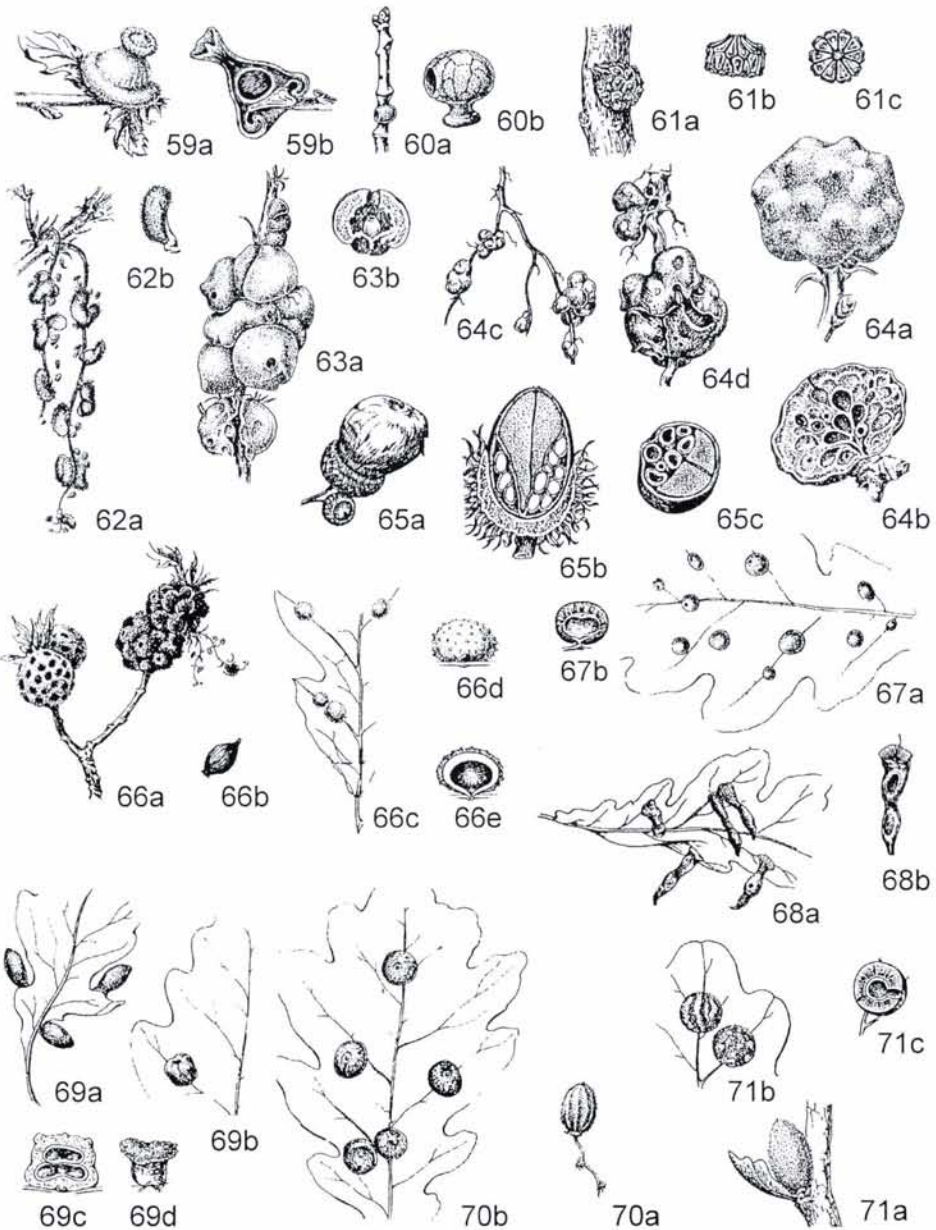
solitarius (BOYER DE FONSCOLOMBE, 1832) – Synonyms: unisexual generation: *Diplolepis gallae pyriformis* OLIVIER, 1791, *Cynips gallae pyriformis caudatae* ANTHOINE, 1794, *Diplolepis solitarius* BOYER DE FONSCOLOMBE, 1832, *Aphilothrix solitaria*: MAYR 1870, *Andricus solitarius*: MAYR 1882, *Cynips ferruginea* HARTIG, 1840; bisexual generation: *Andricus occultus* TSCHKE 1871, *Oncaspis filigranata* DETTMER, 1925, *Andricus solitarius filigranatus*: DOCTEURS VAN LEEUWEN 1934. Recently *Andricus villarrubiae* TAVARES, 1930 was synonymized to *A. solitarius* (PUJADE-VILLAR, MELIKA & CSÓKA 2000, in print). – Alternate uni- and bisexual generations are known (DOCTERS VAN LEEUWEN 1934). The bisexual generation induces bud galls (Figs 55b-c), usually found in the leaf axils (Fig. 55a), the unisexual generation produces catkin galls on *Q. petraea*, *Q. pubescens*, *Q. robur*, *Q. farnetto*; *Q. virgiliana*, and rarely on *Q. cerris*.

stefanii (KIEFFER, 1897) – Synonyms: *Cynips Stefaniae* KIEFFER, 1897, *Adleria stefanii*: ROHWER & FAGAN 1917, *Andricus stefanii*: BENSON 1953. – *Cynips keszthelyensis* was described by MÉHES (1953) on the basis of a gall only. In the original description he mentioned that the gall holotype collected in Italy (Abbazia) and one gall paratype from Hungary (Keszthely), two adult wasps he reared from galls (did not describe them because they were damaged) were deposited at the HNHM in Budapest where, however, we did not find them either in the general collection or in the MÉHES collection. According to MÉHES (1953) the species belongs to the *polycerus*-group, the structure of the gall closely resembles that of *A. polycerus* and especially *A. stefanii*. Later, except AMBRUS (1974a), nobody mentioned this species. According to the International Code of Zoological Nomenclature (Art. 1b and Art. 72c) species described on the basis of galls after 1930 are not valid and, thus, *Cynips keszthelyensis* is a **nomen nudum** of *Andricus stefanii*. – Only the unisexual generation is known to induce bud galls on *Q. pubescens* and *Q. petraea*.

subterranea (GIRAUD, 1859) – Synonyms: *Cynips subterranea* GIRAUD, 1859, *Cynips trinacriae* DE STEFANI, 1906 (synonym of *A. subterranea* (BELLIDO & PUJADE-VILLAR, in print), *Adleria subterranea*: ROHWER & FAGAN 1917, *Andricus subterranea*: BENSON 1953. *Cynips polycera trinacriae* DALLA TORRE & KIEFFER, 1910 is a **syn. n.** of *A. subterranea*. – Only the unisexual generation is known to induce bud galls on *Q. petraea*, *Q. pubescens* and rarely on *Q. robur* (AMBRUS 1974a) (Fig. 56).

superfetationis (GIRAUD, 1859) – Synonyms: *Cynips superfetationis* GIRAUD, 1859, *Andricus superfetationis*: PASZLAWSZKY 1884. – TAVARES (1916) described a new subspecies, *Andricus superfetationis geresianus* from Portugal, the female of which has a 14-segmented antenna and also colouration differs from the typical. TAVARES' cynipid collection was destroyed and, thus, it is impossible to study his types. After TAVARES' record it has never been collected on the Iberian Peninsula. So, the validity of this subspecies is doubtful and, thus, we consider *Andricus superfetationis geresianus* as a **nomen dubium**. – Only the unisexual generation is known to induce galls on acorn cups on *Q. petraea*, *Q. pubescens*, and *Q. robur* (Figs 57a-b).

tomentosus (TROTTER, 1901) – Synonyms: *Cynips tomentosa* TROTTER, 1901, *Adleria tomentosa*: ROHWER & FAGAN 1917, *Andricus tomentosa*: BENSON 1953. – Only the unisexual gen-



Figs 59–71. Oak galls. 59a–b: *A. tomentosus*. 60a–b: *A. trotteri*. 61a–c: *A. truncicolus*. 62a–b: *A. vindobonensis*. 63a–b: *Aphelonyx cerricola*. 64: *Biorhiza pallida*: a–b = bisex. gen., c–d = unisex. gen. 65a–c: *Callirhytis glandium*. 66: *Chilaspis nitida*: a–b = bisex. gen., c–e = unisex. gen. 67a–b: *Cynips agama*, unisex. gen. 68a–b: *C. cornifex*, unisex. gen. 69: *C. disticha*: a = bisex. gen., b–d = unisex. gen. 70: *C. divisa*: a = bisex. gen., b = unisex. gen. 71: *C. longiventris*: a = bisex. gen., b–c = unisex. gen.

eration is known to induce bud galls on *Q. petraea*, *Q. pubescens*, *Q. robur*, and *Q. farnetto*. In Hungary it was collected only in the Kőszeg Mts. (AMBRUS 1974a, GM) (Figs 59a-b).

trotteri KIEFFER, 1898. – Only the unisexual generation is known to induce bud galls on *Q. robur* and *Q. pubescens*. Rare in Hungary (Figs 60a-b).

truncicolus (GIRAUD, 1859) – Synonyms: *Cynips truncicola* GIRAUD, 1859, *Adleria truncicola*: ROHWER & FAGAN 1917, *Andricus truncicola*: BENSON 1953. – Only the unisexual generation is known to induce galls on accessory buds on branches of old trees on *Q. petraea*, *Q. pubescens*, and *Q. robur* (Figs 61a-c).

vindobonensis MUELLNER, 1901 – Only the bisexual generation is known to induce catkin galls on *Q. cerris* (Figs 62a-b).

Aphelonyx MAYR, 1881

cerricola (GIRAUD, 1859) – Synonyms: *Cynips cerricola* GIRAUD, 1859, *Aphelonyx cerricola*: MAYR 1881. – Only the unisexual generation is known to induce bud galls on *Q. cerris* (Figs 63a-b).

Biorhiza WESTWOOD, 1840

pallida (OLIVIER, 1791) – Synonyms: bisexual generation: *Diplolepis pallidus* OLIVIER, 1791, *Diplolepis gallae cerebriformis* ANTHOINE, 1794, *Diplolepis gallae alveariformis* ANTHOINE, 1794, *Cynips quercus terminalis* FABRICIUS, 1798, *Diplolepis quercus terminalis*: BOYER DE FONSCOLOMBE 1832, *Teras terminalis*: HARTIG 1840, *Diplolepis terminalis*: MARSHALL 1867, *Dryoteras terminalis*: FÖRSTER 1869, *Andricus terminalis*: MAYR 1871, *Biorhiza terminalis*: MAYR 1881, *Biorhiza pallida*: KIEFFER 1898; unisexual generation: *Cynips aptera* BOSC, 1791, *Cynips aptera* FABRICIUS, 1793, *Apophyllus apterus*: HARTIG 1840, *Biorhiza aptera*: MAYR 1870. – The variability of this species is high, both chromatically and morphologically and especially in apterous bisexual forms. *Biorhiza pallida codinae* TAVARES, 1928 and *Biorhiza pallida lusitanica* TAVARES, 1928 were described on the basis of chromatic differences only and which are of no diagnostic value (PUJADE-VILLAR 1991), thus, we consider *Biorhiza pallida codinae* TAVARES and *Biorhiza pallida lusitanica* TAVARES as **syn. n.** of *B. pallida*. Another subspecies, *Biorhiza pallida hispanica* TAVARES, 1928, has a different number of antennal flagellomeres than the typical form. One of the authors (JP-V) has studied specimens of *Biorhiza pallida* from the VILLARRÚBIA collection (MZB), which emerged from the same gall, and the number of antennal segments in the females varied from 14 to 15 (PUJADE-VILLAR 1991). For this reason, we consider *Biorhiza pallida hispanica* TAVARES as a **syn. n.** of *B. pallida*. Finally, *Biorhiza pallida mirbeckii* (MARSHALL) (DALLA TORRE & KIEFFER 1910) collected in Algeria, probably, is another variation of the typical form which is characterized by the presence of apterous females only and with predominantly black colour of the body. We have not studied material on this subspecies and, thus, we prefer to keep the status of this taxon till material for study will be available. – Alternate uni- and bisexual generations are known (ADLER 1881, FOLLIO 1964). The unisexual generation induces galls at the end of shoots (Figs 64a-b), bisexual generation: on roots on *Q. robur* and *Q. petraea* mainly, also on *Q. pubescens* and *Q. farnetto*, less frequently on *Q. cerris* (Figs 64c-d).

Callirhytis FOERSTER, 1869

glandium (GIRAUD, 1859) – Synonyms: unisexual generation: *Andricus glandium* GIRAUD, 1859, *Cynips glandium*: KALTENBACH 1867, *Callirhytis glandium*: DALLA TORRE & KIEFFER, 1910; *Callirhytis erythrocephala* (GIRAUD) NIEVES-ALDREY, 1983 (non GIRAUD, 1859); bisexual generation: *Callirhytis glandium* forma *aestivalis* NIEVES-ALDREY, 1992. – Alternate uni- and bisexual generations are known (BARBOTIN, pers. com. in NIEVES-ALDREY 1992). The bisexual generation induces galls within acorn (Figs 65a-c), the unisexual generation produces galls in young twigs on *Q. pubescens*, *Q. robur*, and *Q. cerris*.

Chilaspis MAYR, 1881

nitida (GIRAUD, 1882) – Synonyms: unisexual generation: *Andricus nitidus* GIRAUD, 1859, *Chilaspis nitida*: MAYR 1881; bisexual generation: *Chilaspis loewi* WACHTL, 1882. – Alternate uni- and bisexual generations are known. The bisexual generation induces galls on underside of leaves (Figs 66c-e), the unisexual generation produces cotton-wool-like galls on the catkin inflorescences on *Q. cerris* (Figs 66a-b).

Cynips LINNAEUS, 1758

agama HARTIG, 1840 – Synonyms: unisexual generation: *Dryophanta agama*: MAYR 1870, *Diplolepis agama*: DALLA TORRE & KIEFFER 1910; bisexual generation *Cynips agama* forma *mailleti* FOLLIOU, 1964. – Alternate uni- and bisexual generations are known, both induce galls on leaves on *Q. robur*, *Q. petraea*, *Q. pubescens*, and *Q. farnetto* (Figs 67a-b). Abundant on *Q. petraea*.

cornifex HARTIG, 1843 – Synonyms: *Dryophanta cornifex*: MAYR 1870. – Only the unisexual generation is known to induce galls on leaves on *Q. petraea* and *Q. pubescens* (Figs 68a-b).

disticha HARTIG, 1840 – Synonyms: unisexual generation: *Dryophanta disticha*: MAYR 1870, *Diplolepis disticha*: DALLA TORRE & KIEFFER 1910; bisexual generation: *Cynips disticha* forma *indistincta* NIBLETT, 1948. – Alternate uni- and bisexual generations are known (NIBLETT 1948). The bisexual generation induces leaf galls (Fig. 69b-d), the unisexual generation produces galls on the leaf margin on *Q. petraea*, *Q. robur*, and *Q. pubescens* (Figs 69a).

divisa HARTIG, 1840 – Synonyms: unisexual generation: *Dryophanta divisa*: MAYR 1870, *Diplolepis divisa*: DALLA TORRE & KIEFFER 1910; bisexual generation: *Spathogaster verrucosus* SCHLECHTENDAL, 1870, *Spathogaster verrucosa*: MAYR 1870, *Cynips verrucosa*: KALTENBACH 1874, *Dryophanta verrucosa*: MAYR 1882. – Alternate uni- and bisexual generations are known (ADLER 1881), both induce galls on leaves on *Q. petraea*, *Q. pubescens*, *Q. robur*, and *Q. farnetto* (Fig. 70a – bisex. gall, Fig. 70b – unisex. gall).

longiventris HARTIG, 1840 – Synonyms: unisexual generation: *Dryophanta longiventris*: MAYR 1870, *Diplolepis longiventris*: DALLA TORRE & KIEFFER 1910; bisexual generation: *Spathogaster similis* ADLER, 1881, *Dryophanta similis*: MAYR 1882, *Cynips longiventris* f. *substituta* KINSEY, 1930. – Alternate uni- and bisexual generations are known (ADLER 1881). The bisexual generation induces leaf galls (Fig. 71b-c), the unisexual generation produces galls on the bark of the main trunk, on dormant buds, and less often on younger shoots on *Q. robur*, *Q. petraea*, *Q.*

pubescens, and *Q. farnetto* (Figs 71a). Common on *Q. robur*. The galls of the bisexual generation are hardly recognizable.

quercus (FOURCROY, 1785) – Synonyms: *Diplolepis quercus* FOURCROY, 1785, *Cynips folii* (LINNAEUS) SCHENCK, 1863 (non LINNAEUS, 1758), *Dryophanta folii* MAYR, 1870, *Dryophanta pubescentis* MAYR, 1881, *Dryophanta ilicis* KIEFFER, 1896. – The bisexual generation is unknown. In the literature, *Spathogaster flosculi* GIRAUD (see *Cynips quercus folii*) is mentioned as the bisexual form of this species, however, without experimentation. After studying the type material on *Spathogaster flosculi* we have concluded that it is impossible to distinguish this form from *Spathogaster taschenbergi* SCHLECHTENDAL. One of the authors (JP-V) has collected a new bisexual form, very different from other bisexual forms of *Cynips* on the Iberian Peninsula. This is probably the bisexual form of *Cynips quercus*, because it is very unlikely that these specimens represent a bisexual form of an undescribed species. The unisexual gall develops on underside of leaves on *Q. petraea*, *Q. pubescens*, *Q. robur*, and *Q. farnetto* (Figs 72a-b).

quercusfolii (LINNAEUS, 1758) – Synonyms: bisexual generation: *Spathogaster taschenbergi* SCHLECHTENDAL, 1870. – One of the authors (JP-V) has studied the type material on *Spathogaster flosculi* GIRAUD, 1868, composed by several specimens deposited in MHNP; galls and adults are indistinguishable from *Spathogaster taschenbergi*. This bisexual form and its synonym, *Spathogaster giraudi* TSCHER, 1869 are **syn. n.** of *Cynips quercusfolii*. According to these results, the new name of the bisexual form of *Cynips quercusfolii* is *Spathogaster flosculi* GIRAUD. – Alternate uni- and bisexual generations are known (ADLER 1881). The unisexual generation induces galls in buds (Figs 73a-b), bisexual generation: galls on underside of leaves on *Q. petraea*, *Q. pubescens*, *Q. robur*, *Q. farnetto*; less frequently on *Q. cerris* (Fig. 73c).

Dryocosmus GIRAUD, 1859

cerriphilus GIRAUD, 1859 – Synonyms: *Cynips cerriphilus*: KALTENBACH 1867. – Only the unisexual generation is known to induce galls on twigs in a form of crowded mass which encircling the twig of *Q. cerris* (Fig. 74). – Probably the bisexual form of this species is *Dryocosmus nervosus* (GIRAUD) but nobody has confirmed this experimentally yet (PUJADE-VILLAR 1985).

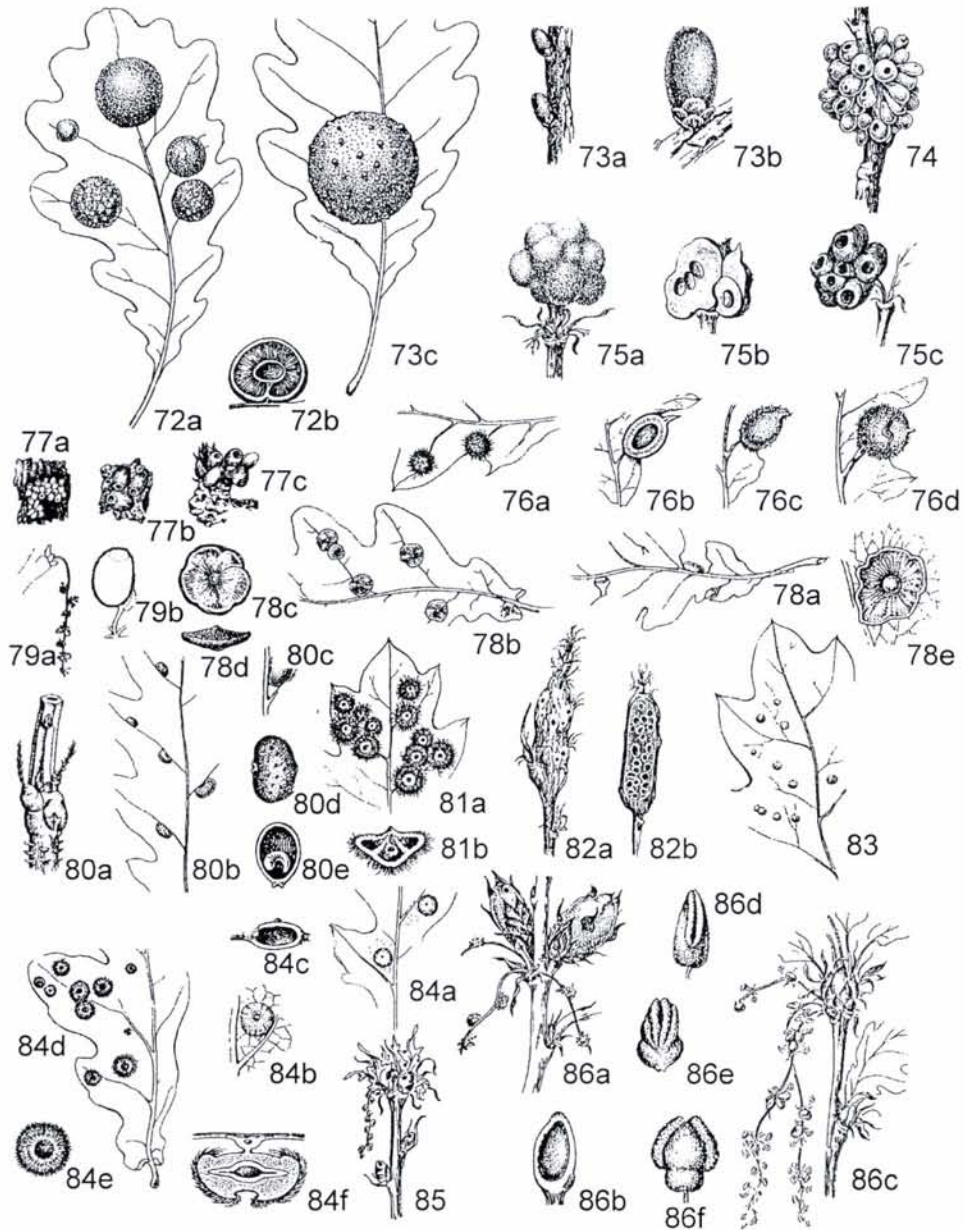
mayri MUELLNER, 1901. – Only the bisexual generation is known to induce galls on the tip of young twigs on *Q. cerris* only (Figs 75a-c)

nervosus (GIRAUD, 1859) – Synonyms: *Spathogaster nervosa* GIRAUD, 1859, *Dryocosmus nervosus*: MAYR 1882, *Cynips nervosus*: KALTENBACH 1867. – Only the bisexual generation is known to induce leaf galls on *Q. cerris* only (Figs 76a-d). – Probably the bisexual form of this species is *Dryocosmus cerriphilus* GIRAUD but nobody confirmed it experimentally yet (PUJADE-VILLAR 1985).

Neuroterus HARTIG, 1840

aggregatus (WACHTL, 1880) – Synonyms: *Spathogaster (Ameristus) aggregata* WACHTL, 1880, *Neuroterus aggregatus*: MAYR 1882. – Only the unisexual generation is known to induce galls in adventitious buds on *Q. cerris* only (Figs 77a-c).

albipes SCHENCK, 1863 – Synonyms: bisexual generation: *Spathogaster albipes* SCHENCK, 1863, *Andricus albipes*: TASCHENBERG 1866, *Cynips albipes*: KALTENBACH 1874, *Neuroterus*



Figs 72–86. Oak galls. 72a–b: *Cynips quercus*, unisex. gen. 73: *C. quercusfolii*: a–b = bisex. gen., c = unisex. gen. 74: *Dryocosmus cerriphilus*. 75a–c: *D. mayri*. 76a–d: *D. nervosus*. 77a–c: *Neuroterus aggregatus*. 78: *N. albipes*: a = bisex. gen., b–d = unisex. gen. 78c: *N. albipes* var. *reflexus*. 79a–b: *N. ambrusi*. 80: *N. anthracina* (= *ostreus*): a = bisex. gen., b–e = unisex. gen. 81a–b: *N. lanuginosus*. 82a–b: *N. macropterus*. 83: *N. minutulus*. 84: *N. numismalis*: a–c = bisex. gen., d–f = unisex. gen. 85: *N. obtectus*. 86: *N. politus*: a–b = bisex. gen., c–f = unisex. gen.

albipes: MAYR 1882, *Neuroterus albipes albipes*: DALLA TORRE & KIEFFER 1910; *Neuroterus codinae* TAVARES, 1928; the unisexual generation produces *Neuroterus laeviusculus* SCHENCK, 1863, *Neuroterus pezizaeformis* SCHLECHTENDAL, 1870, *Cynips pezizaeformis*: KALTENBACH 1874. The subspecies, *Neuroterus albipes lusitanicus* TAVARES, 1902, described on the basis of chromatic differences only and which are of no diagnostic value, we consider as a **syn. n.** of *N. albipes*. – KIEFFER (1897–1901) described a new variety of this species, *N. laeviusculus* var. *reflexus*, which later was erected to the subspecies level, *Neuroterus albipes reflexus* (DALLA TORRE & KIEFFER 1910) (Fig. 78e). In Hungary this subspecies associates with *Q. robur* only (AMBRUS 1974a), absent from the Iberian Peninsula. It might be interesting to do some field experiments with this subspecies, because it is possible that it might be a distinct species – its gall significantly differs from that of the unisexual generation of *N. albipes*. – Alternate uni- and bisexual generations are known (ADLER 1881, PUJADE-VILLAR 1985). The bisexual generation induces spangle galls on leaves (Fig. 78b–d), the unisexual generation produces galls on the leaf margin on *Q. petraea*, *Q. pubescens*, *Q. robur*, and *Q. farnetto*; occasionally on *Q. cerris* (Figs 78b–d).

ambrusi MELIKA, STONE et CSÓKA, 1999 – Only the unisexual generation is known to induce catkin galls on *Q. cerris* only. The species was found in the vicinity of Tatabánya (MELIKA, STONE & CSÓKA 1999) (Figs 79a–b).

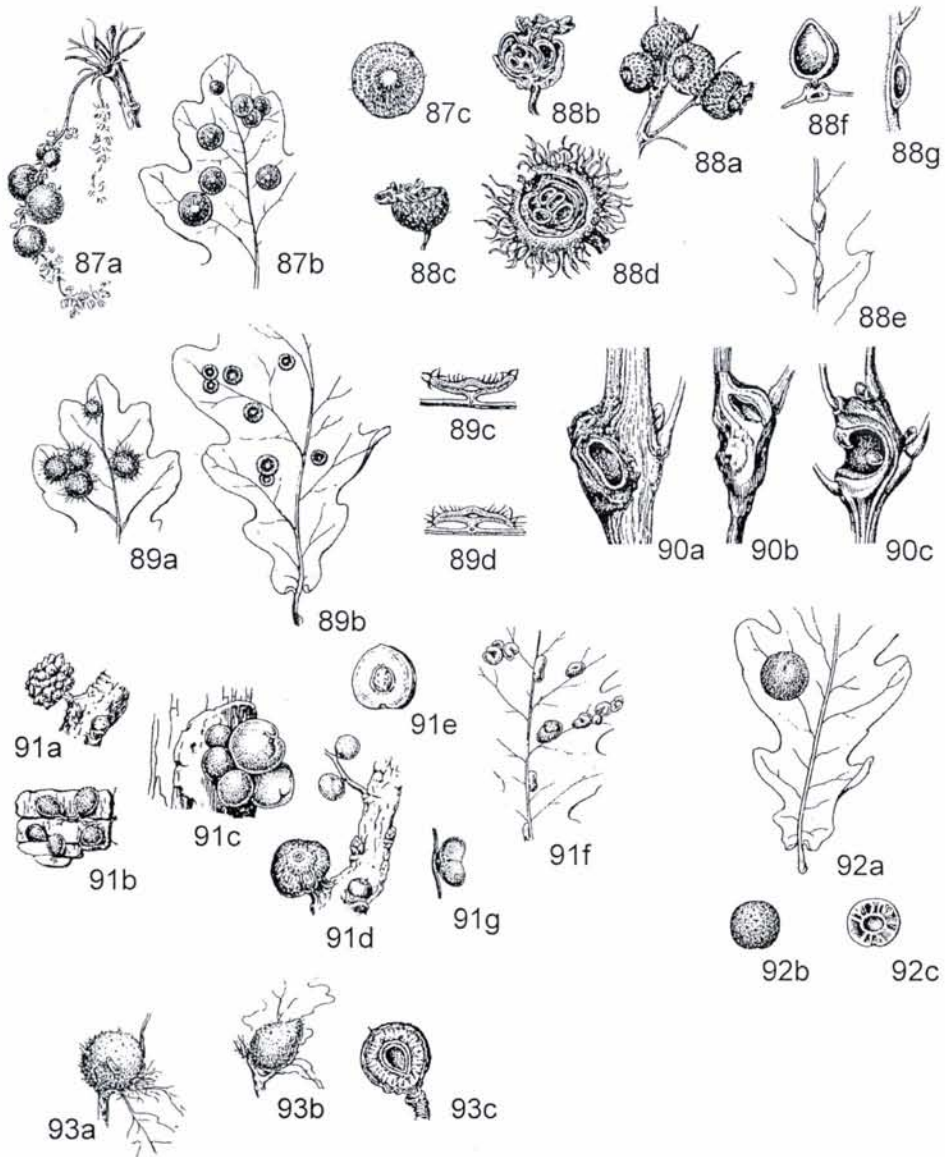
anthracina (CURTIS, 1838) – Synonyms: unisexual generation: *Cynips anthracina* CURTIS, 1838, *Neuroterus anthracina*: PUJADE-VILLAR, ROS-FARRÉ & ARNEDO 1998; *Diptolepis flavipes* FONSCOLOMBE, 1832, *Cynips flavipes*: DALLA TORRE 1893, *Cynips oστria* HARTIG, 1840, *Neuroterus ostreus*: GIRAUD 1859, *Andricus ostreus*: MAYR 1882, *Neuroterus ostrea major* TAVARES, 1992, *Andricus ostreae*: MOKRZECKI 1929, *Andricus oστria*: KIERYCH 1979, *Andricus anthracina*: QUINLAN & FERGUSON 1981; bisexual generation: *Neuroterus furunculus* BEYERINCK, 1882, *Andricus furunculus*: KIEFFER 1897–1901. – Alternate uni- and bisexual generations are known. The bisexual generation induces small rounded leaf underside galls (Figs 80b–e), usually on lateral veins; the unisexual generation produces galls on the surface of the shoot axis on *Q. petraea* and *Q. pubescens* (Fig. 80a).

lanuginosus GIRAUD, 1859 – Synonyms: *Cynips lanuginosus*: KALTENBACH 1867. – Only the unisexual generation is known to induce spangle-like galls, usually found in small groups on the underside on *Q. cerris* leaves (Figs 81a–b).

macropterus (Hartig, 1843) – Synonyms: *Cynips macroptera* HARTIG, 1843, *Dryophanta macroptera*: MAYR 1870, *Neuroterus macropterus*: MAYR 1882. – Only the unisexual generation is known to induce galls within the apex of shoots 1–2 years old, often found in large groups on *Q. cerris* (Figs 82a–b).

minutulus GIRAUD, 1859 – Synonyms: *Cynips minutulus*: KALTENBACH 1867. – Only the unisexual generation is known to induce leaf galls on veins, usually on the underside of the leaf on *Q. cerris* only (Fig. 83).

numismalis (FOURCROY, 1785) – Synonyms: unisexual generation: *Cynips numismalis* FOURCROY, 1785, *Neuroterus numismalis* [sic!] OLIVIER, 1790, *Neuroterus reamunurii* HARTIG, 1840, *Cynips reamuri*: KALTENBACH 1867, *Neuroterus numismalis*: KIEFFER 1897–1901; *Cynips quercus tiarae* CURTIS, 1843, *Neuroterus defectus* HARTIG, 1840 (PUJADE-VILLAR & ROSS-FARRÉ 2000, in print), *Neuroterus nigricornis* SCHENCK, 1863; bisexual generation: *Cynips vesicatrix* SCHLECHTENDAL, 1870, *Spathogaster vesicatrix*: MAYR 1871, *Neuroterus vesicatrix*: MAYR 1882. – Alternate uni- and bisexual generations are known (ADLER 1881). The bisexual generation induces spangle leaf galls (Figs 84d–f), the unisexual generation produces circular parenchymatous leaf galls, in vein axils or at the leaf margin on *Q. petraea*, *Q. pubescens*, *Q. robur*, and *Q. farnetto* (Figs 84a–c).



Figs 87–93. Oak galls. 87: *Neuroterus quercusbaccarum*: a = bisex. gen., b–c = unisex. gen. 88: *N. saliens*: a–d = bisex. gen., e–g = unisex. gen. 89: *N. tricolor*: a = bisex. gen., b–d = unisex. gen. 90a–c: *Plagiotrochus marianii*. 91: *Trigonaspis megaptera*: a–c = bisex. gen., f–g = unisex. gen. 92: *T. synaspis*: a–c = bisex. gen. 93: *Synophrus politus*.

obtectus (WACHTL, 1880) – Synonyms: *Spathogaster (Ameristus) oblecta* WACHTL, 1880, *Neuroterus oblectus*: MAYR 1882. – Only the bisexual generation is known to induce solitary bud galls on *Q. cerris* only (Fig. 85).

politus HARTIG, 1840 – Synonyms: unisexual generation: *Andricus burgundus* (GIRAUD) SCHELECHTENDAL, 1870 (non GIRAUD, 1859), *Neuroterus schlechtendali* MAYR, 1870, *Neuroterus bipunctatus* HARTIG, 1841, *Neuroterus rubeculus*, HARTIG, 1841, *Neuroterus nitens* HARTIG, 1841; bisexual generation: *Spathogaster petioliventrif* HARTIG, 1840, *Spathogaster aprilinus* GIRAUD, 1859, *Cynips aprilinus*: KALTENBACH 1867, *Neuroterus aprilinus*: MAYR 1882. PUJADE-VILLAR & ROS-FARRÉ (2000, in print) after examination of Hartig's *Neuroterus* types, found that *N. politus* was described earlier than *N. petioliventrif* and *N. aprilinus* and, thus *N. politus* must be the valid name of this species. The same authors also synonymized HARTIG's following species to *N. politus*: *N. bipunctatus*, *N. rubeculus*, and *N. nitens*. – Alternate uni- and bisexual generations are known (FOLLIO 1964). The bisexual generation induces catkin galls (Figs 86c-f); the unisexual generation produces galls on the tips of the previous year's shoots on *Q. petraea*, *Q. pubescens*, and *Q. robur* (Figs 86a-b).

quercusbaccarum (LINNAEUS, 1758) – Synonyms: bisexual generation: *Cynips quercus baccarum* LINNAEUS, 1758, *Cynips quercus pedunculi* LINNAEUS, 1758, *Cynips baccarum quercus* FOURCROY, 1785, *Cynips pedunculi quercus* FOURCROY, 1785, *Diplolepis gallae pisiformis* ANTHOINE, 1794, *Diplolepis gallae concatenatae* ANTHOINE, 1794, *Diplolepis quercusbaccarum*: BOYER DE FONSCOLOMBE 1832, *Cynips interruptrix* HARTIG, 1840, *Diplolepis pedunculi*: SCHENCK 1863, *Neuroterus baccarum*: MAYR 1882, *Neuroterus quercusbaccarum*: DALLA TORRE & KIEFFER 1910; unisexual generation: *Diplolepis flavipes* FOURCROY, 1785, *Diplolepis lenticularis* OLIVIER, 1791, *Cynips longipennis* FABRICIUS, 1793, *Diplolepis gallae lenticulae* ANTHOINE, 1794, *Neuroterus malpighii* HARTIG, 1840, *Neuroterus lenticularis*: SCHENCK 1863, *Neuroterus attenuatus* SCHENCK, 1863, *Neuroterus striatus* SCHENCK, 1863. – KIEFFER (1897–1901) described two varieties of the unisexual form (the typical form and *Neuroterus lenticularis* var. *histrion*), later they were considered by DALLA TORRE & KIEFFER (1910) as subspecies, *Neuroterus quercusbaccarum quercusbaccarum* and *Neuroterus quercusbaccarum histrion*. TAVARES (1916) added new characters to distinguish them and described two other new subspecies: *Neuroterus quercusbaccarum intermedius* and *Neuroterus quercusbaccarum hispanicus* which differ from typical *N. quercusbaccarum* only by chromatic characters and the relative proportions of the 1st and 2nd antennal flagellomeres – characters which strongly vary and are of no diagnostic value (material on 'histrion' and 'lenticularis' was examined by JP-V in MNHP). For all the mentioned reasons, we consider *Neuroterus quercusbaccarum histrion* (KIEFFER) **syn. n.**, *Neuroterus quercusbaccarum intermedius* TAVARES **syn. n.**, *Neuroterus quercusbaccarum hispanicus* TAVARES **syn. n.** of *N. quercusbaccarum*. – Alternate uni- and bisexual generations are known (ADLER 1881). The bisexual generation induces spangle-like leaf galls (Fig. 87b-c), the unisexual generation produces catkin galls on *Q. petraea*, *Q. pubescens*, *Q. robur*, and *Q. farnetto* (Figs 87a).

saliens (KOLLAR, 1857) – Synonyms: bisexual generation: *Cynips saliens* KOLLAR, 1857, *Neuroterus saliens*: MAYR 1870, *Neuroterus saltans* GIRAUD, 1859; unisexual generation: *Spathogaster glandiformis* GIRAUD, 1859, *Cynips glandiformis*: KALTENBACH 1867, *Neuroterus glandiformis*: MAYR 1882. – Alternate uni- and bisexual generations are known (BARBOTIN 1972). The bisexual generation induces acorn galls on *Q. robur*, *Q. petraea*, and *Q. cerris* (Figs 88a-d); the unisexual generation produces galls on shoots on *Q. cerris* only (Figs 88e-g).

tricolor (HARTIG, 1841) – Synonyms: bisexual generation: *Spathogaster tricolor* HARTIG, 1841, *Cynips tricolor*: KALTENBACH 1867, *Neuroterus tricolor*: MAYR 1882; unisexual generation: *Neuroterus fumipennis* HARTIG, 1841, *Spathogaster fumipennis*: MARSHALL 1867, *Spathogaster varius* SCHENCK, 1863, *Cynips fumipennis*: THOMSON 1877, *Neuroterus tricolor ulisipponensis*

TAVARES, 1928 (PUJADE-VILLAR & ROSS-FARRÉ 1999, in print). – Alternate uni- and bisexual generations are known (ADLER 1881). The bisexual generation induces galls embedded in the leaf lamina (Fig. 89a); the unisexual generation produces spangle-like leaf galls on *Q. petraea*, *Q. pubescens*, *Q. robur*, and *Q. farnetto* (Figs 89b-d).

Plagiotrochus MAYR, 1881

marianii (KIEFFER, 1902) – Synonyms: unisexual generation: *Callirhytis marianii* KIEFFER, 1902a; *Fioria marianii*: KIEFFER 1903a, *Fioriella marianii*: KIEFFER 1903b; bisexual generation: *Callirhytis meunieri* KIEFFER, 1902b, *Fioria meunieri*: KIEFFER 1903a; *Fioriella meunieri*: KIEFFER 1903b. – After revising types of this species, MELIKA, PUJADE-VILLAR & ROS-FARRÉ (2000, in print) transferred this species to the *Plagiotrochus* genus and thus the genus *Fioriella* became a synonym of *Plagiotrochus*. – Alternate uni- and bisexual generations are known (KIEFFER 1902b). The bisexual generation induces galls on *Q. petraea*, on the shoot opposite a developing leaf, causing retardation of this leaf's development; the unisexual generation induces galls on axial buds on *Q. cerris* (Figs 90a-c). AMBRUS (1974a) mentioned this species for Košice (Slovakia) and supposedly it can be found in Hungary too, however, must be confirmed.

Trigonaspis HARTIG, 1840

megaptera (PANZER, 1801) – Synonyms: bisexual generation: *Cynips megaptera* PANZER, 1801, *Trigonaspis megaptera*: SCHENCK 1863, *Trigonaspis crustalis* HARTIG, 1840, *Cynips crustalis*: KALTENBACH 1867; the unisexual generation produces *Cynips renum* HARTIG, 1840, *Biorhiza renum*: GIRAUD 1859, *Trigonaspis renum*: MAYR 1881. – Alternate uni- and bisexual generations are known (ADLER 1881). The bisexual generation induces galls on the underside of the leaf in vein axis (Figs 91f-g), the unisexual generation produces galls on accessory buds on *Q. petraea*, *Q. pubescens*, *Q. robur*, and *Q. farnetto* (Figs 91a-e).

synaspis (HARTIG, 1841) – Synonyms: unisexual generation: *Apophyllus synaspis* HARTIG, 1841, *Biorhiza synaspis*: TASCHENBERG 1866, *Cynips synaspis*: KALTENBACH 1867, *Trigonaspis synaspis*: MAYR 1881; bisexual generation: *Trigonaspis megapteropsis* KIEFFER, 1900, *Trigonaspis megaptera*: TAVARES, 1905 (non PANZER, 1801). – Alternate uni- and bisexual generations are known (WRIESE in KIEFFER 1900). The bisexual generation induces galls on the underside of the leaf (Figs 92a-c), the unisexual generation produces galls on accessory buds on *Q. petraea*, *Q. pubescens*, and *Q. robur*.

Another genus, *Synophrus* HARTIG, 1843, with only one known species from Europe, *S. politus* HARTIG, 1843, which is very common in Hungary (Figs 93a-c). Originally it was described as a gall inducer, however, on the basis of the morphological characters of adults, this genus undoubtedly belongs to cynipid inquilines. *Synophrus* has never been a subject of detailed research and, thus, it is possible that they represent inquilines incorrectly identified as gall inducers. From the large series of galls of *S. politus* collected all over the territory of Hungary, we reared not only numerous *S. politus* females and males, but also large numbers of inquilines which belongs to *Saphonecrus* DALLA TORRE & KIEFFER, 1910 and *Synergus* HARTIG, 1843 genera. So, it is quite possible that *Synophrus* species, in spite of their taxonomic identity with cynipid inquilines, dispose with

gall-inducing capability. The only known species for the Hungarian cynipid fauna, *S. politus*, associates with *Q. cerris* only.

MÉHES (1953) described a new species, *Amphibolips mernyensis*, on the basis of one gall, collected from *Q. cerris* near Mernye (Hungary). In the original description he mentioned that the holotype gall was deposited in the HNHM (Budapest), however, we did not find it. Representatives of the genus *Amphibolips* REINHARD, 1865 are restricted in their distribution to North and Central America only. So, it was erroneously put into *Amphibolips* genus by MÉHES. He based that on the shape of the gall. However, according to the International Code of Zoological Nomenclature this taxon is a **nomen nudum** (see for example *Andricus stefanii*).

* * *

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