

# ***Eupteryx cytinsularis*, a new species of the *melissae* group (Rhynchota Auchenorrhyncha Cicadellidae) from Sicily, Sardinia and Corsica**

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## **Abstract**

*Eupteryx cytinsularis* sp. nov. (Rhynchota Auchenorrhyncha Cicadellidae Typhlocybinae), closely related to *Eupteryx andalusica* Ferrari and *Eupteryx rostrata* Ribaut, is described from Sicily, Sardinia and Corsica. Its position within the genus *Eupteryx* is discussed. In Sardinia the new species was collected on *Cytisus villosus* Pourret (Fabaceae).

**Key words:** Cicadomorpha, Typhlocybinae, distribution, Fabaceae, host plant.

## **Introduction**

*Eupteryx* represents one of the largest genera of the subfamily Typhlocybinae. It is distributed in the Palearctic, Nearctic, Oriental and Ethiopian Regions (Dworakowska, 1979). In Europe are listed 50 species (Hoch, 2004), 27 are recorded from Italy (D'Urso, 1995).

Ribaut (1936) divided the genus in several species groups, some of which later were defined as separate genera. Based on characters of the wing veins, and the head and wing coloration he established the *melissae* group and included there nine species: *Eupteryx andalusica* Ferrari 1882, *E. alticola* Ribaut 1936 [= *E. collina* (Flor 1861)], *E. decemnotata* Rey 1891, *E. collina* (Flor 1861) (= *E. florida* Ribaut 1936), *E. melissae* Curtis 1837, *E. rostrata* Ribaut 1936, *E. stachydearum* (Hardy 1850), *E. thoulessi* Edwards 1926, *E. zelleri* (Kirschbaum 1868). Dworakowska (1979) added to the group further 15 species and described two new ones. The *E. melissae* group is particularly well represented in Europe, in the Near East, and also in West and Central Asia (Dworakowska, 1971).

In this paper we describe a new species of the *melissae* group, *Eupteryx cytinsularis*, recently discovered in Sicily, Sardinia and Corsica, and discuss its position within the genus *Eupteryx*.

## **Materials and methods**

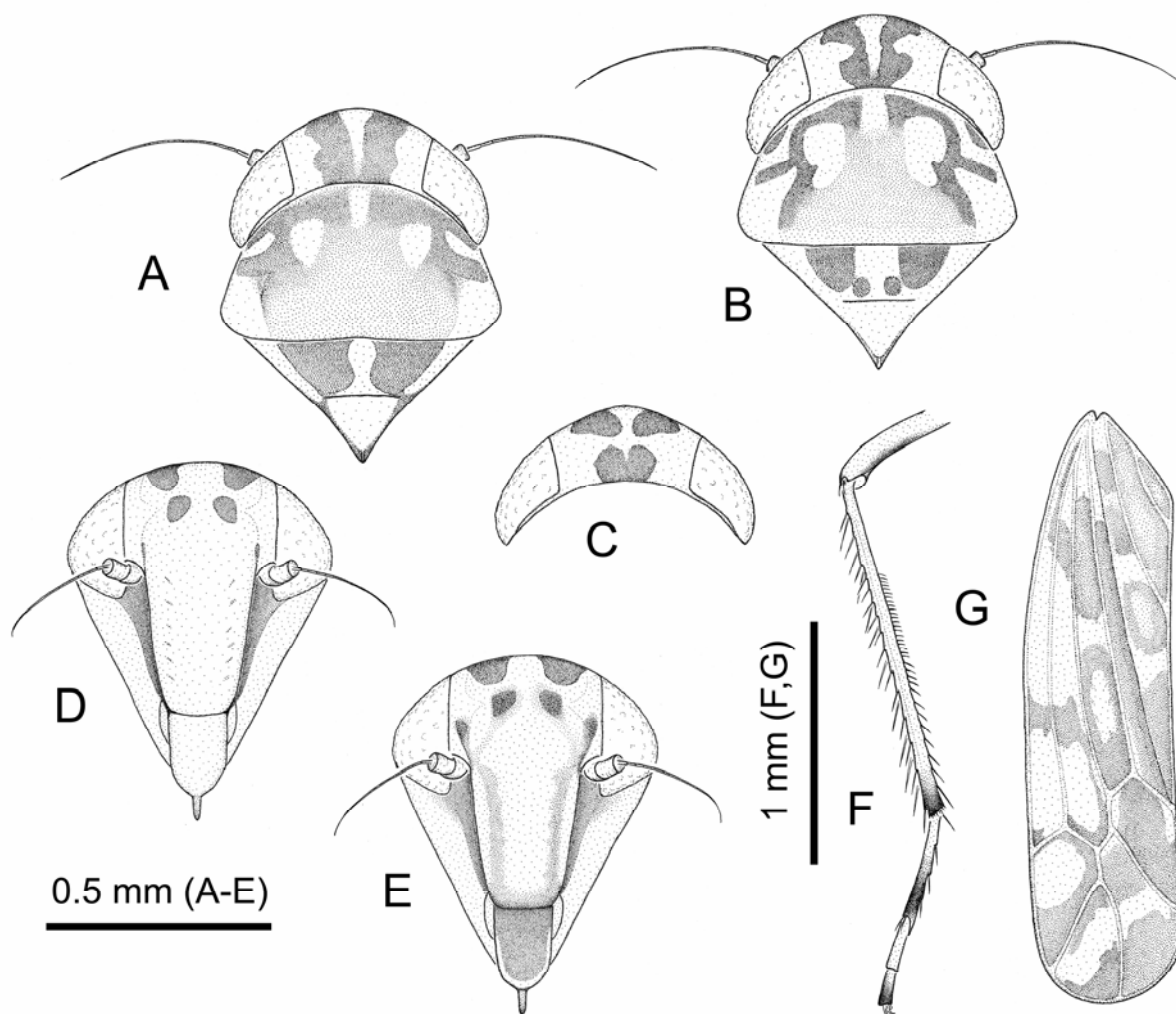
The specimens were collected applying entomological nets and aspirators and mounted on pinned carton. In order to study genital apparatus and apodemes, specimens were transferred for some hours in slightly moist conditions. The genital segment was detached and put in glycerine. Under binocular observation aedeagus and styles were separated from pygofer and genital plates and freed from muscles and connective tissue with the help of two entomological pins. In a similar way the apodemes were detached from the first abdominal segments.

## ***Eupteryx cytinsularis* sp. nov.**

### **Description**

#### **C O L O R A T I O N**

Males (figures 1A, 1B, 1D, 1F, 1G): Tempora white, above base of antennae with narrow line-shaped spot, sometimes indistinct, sometimes broadened in its upper part. Vertex (figures 1A, 1B) light yellow with two pairs of angular black spots, one of them on hind margin with spots confluent or at least very close together, the other one in anterior region with spots triangular, distinctly more distant from each other. Spots on each side normally fused to each other forming irregularly shaped, on midlength narrowed, anteriorly diverging broad bands. Frontoclypeus (figure 1D) yellow, sometimes with light brown transverse markings on sides of midline, near its upper margin with two small rounded or triangular spots, sometimes with connection to dark markings of vertex. Anteclypeus white, in dark specimens more or less brown. Triangular portion of genae near clypeal suture dark brown, other parts white. Pronotum (figures 1A, 1B) dark, somewhat lightened towards its posterior part, with posterior angles, narrow spot in the middle of fore margin, two rounded spots on each side of central part and two small rectangular spots near anterior angles whitish yellow. In some cases dark areas more reduced, light areas more extended. Scutellum (figures 1A, 1B) with pair of black tongue shaped markings, lateral borders, central area and posterior tip yellow. Fore wings (figure 1G) with apical veins all emanating from radial cell and black spot distally of wax area more or less completely covering portion of radius crossing this spot. Underside of thorax black, with mesepisterna and mesepimera yellow. Abdomen black with margins of each segment yellow. Genital valve and pygofer black, anal tube dark brown, genital plates basally black, apically whitish yellow. Fore and middle legs yellow with ventral margin of femora and tibiae and third tarsomere fuscous. Hind legs (figure 1F) yellow with coxae, apex of tibiae, apical half of first tarsomere and complete third tarsomere black, area on the ventral margin of femora near their apex fuscous.



**Figure 1.** *Eupteryx cytinsularis* sp. nov., Sardinia, Monte Limbara (Paratype): Head, pronotum, scutellum, male (A). Head, pronotum, scutellum, male (other specimen) (B). Vertex, female (C). Face, male (D). Face, female (E). Left hind leg, male (F). Left fore wing, male (G).

Females (figures 1C, 1E): As in males with following differences: Linear markings of tempora more distinct, broader; frontoclypeus in its lateral and apical part always dark, anteclypeus always black; black spot distally of wax area of fore wings not covering part of radius crossing this spot; black coloration of hind tibia and tarsus missing or at least less distinct, with apex of tibia, apex of first tarsomere and third tarsomere more or less fuscous. Pregenital segment basally black, apically whitish; pygofer black with yellow ventral margins.

#### Male genital apparatus

Styli as figure 2C, processus of pygofer as figure 2D, aedeagus in ventral view (figure 2B) with triangular apex, apical appendages crossing over shaft, in lateral view (figure 2A) very stout, without dorsal thorn, appendages protruding distinctly ventrally of aedeagus shaft.

#### Apodemes

Apodemes of 2<sup>nd</sup> abdominal sternum (figure 2E) long, reaching 6<sup>th</sup> sternum.

#### Measurements

Males: Body length: 2.8-3.1 mm (Holotype 3.1 mm); hind tibia: 1.32-1.42 mm (Holotype 1.36 mm); metatarsus: 0.73-0.81 mm (Holotype 0.78 mm).

Females: Body length: 3.15-3.58 mm; hind tibia: 1.42-1.61 mm; metatarsus: 0.76-0.83 mm.

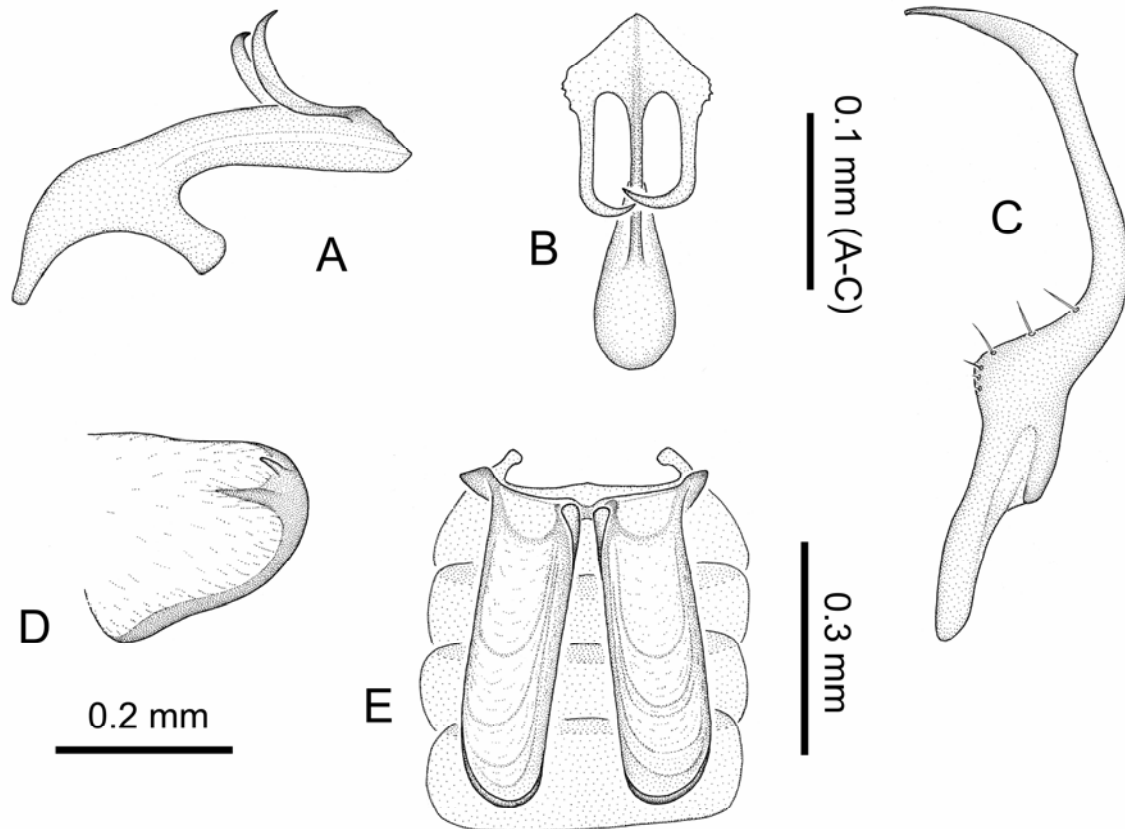
#### Type series

##### Holotype

Male: Italy: Sardinia (Olbia-Tempio Province), Monte Limbara, road SS 392 between Tempio Pausania and Oschiri, km 18.5; ~ 500 m a.s.l.; 14.IV.2007 (locality number 367); Mediterranean forest with *Erica arborea* L., *Quercus suber* L., *Q. ilex* L., *Arbutus unedo* L., *Cytisus villosus* Pourret, *Myrtus communis* L., *Rubus* sp., *Asphodelus* sp., Lamiaceae; Guglielmino and Bückle leg..

##### Paratypes

Same data as holotype; 9 males, 35 females. - Sardinia (Olbia-Tempio Province), Monte Limbara, road to the peak region ~ 900 m from fork with road SS 392 Tempio Pausania - Oschiri; ~ 900 m a.s.l.; 07.VI.2006



**Figure 2.** *Eupteryx cytinsularis* sp. nov., male, Sardinia, Monte Limbara (Paratype): Aedeagus, lateral view, from the right (A). Aedeagus, ventral view (B). Right genital style, dorsal view (C). Right pygofer lobe, from inside (D). 2nd - 6th abdominal sterna, dorsal view (E).

(locality number 259); mixed forest with *Pinus* sp., *Salix* sp., *Ficus carica* L., *Arbutus unedo* L., *Q. ilex* L. and undergrowth with *E. arborea* L., *Rubus* sp., Gramineae, *Cytisus villosus* Pourret; Bückle and Guglielmino leg.; 11 males, 28 females. - Sicily (Catania Province), Etna, Vacchiera (Pedara), WB0467; 800 m a.s.l.; 09.V.1988; mixed forest with *Q. ilex* L., *Q. pubescens* Willd., and clearings with Poaceae, Brassicaceae, *Euphorbia* sp., *Genista aetnensis* (Biv.) DC.; Guglielmino leg.; 1 male. - Sicily (Catania Province), Etna, Monte Baracca (Linguaglossa), WB0481; 1650 m a.s.l.; 23.VI.1988; mixed forest with *Pinus laricio* Poiret, *Betula aetnensis* Rafin, and clearings with *Pteridium aquilinum* (L.) Kuhn, *Astragalus siculus* Biv., *Festuca* sp., *Achillea ligustica* All., *Tanacetum siculum* (Guss.) Strobl. and *Linarea purpurea* (L.) Miller; Guglielmino leg.; 1 male. - Sicily (Catania Province), Etna, c/o Case Cucchiara (Maletto), VB9084; 1070 m a.s.l.; 28.V.1988; open forest of *Castanea sativa* Miller and area with herbaceous vegetation with Poaceae, *Urtica* sp., *Rubus* sp., *P. aquilinum* (L.) Kuhn; Guglielmino leg.; 4 males. - France: Corsica, Bains de Guitera, surroundings of Travo river; 680 m a.s.l.; 06.IV.2006; meadow with *Olea europaea* L. and *Phillyrea* sp.; Václav Čermák leg.; 1 male.

Holotype, 78 paratypes from Sardinia and one paratype from Sicily are deposited in Dipartimento di Prote-

zione delle Piante, Università della Tuscia, Viterbo, Italy (collection Guglielmino), 5 paratypes from Sicily are in Dipartimento di Biologia "Marcello La Greca", Università di Catania, Italy (collection D'Urso), 5 paratypes from Sardinia and one paratype from Corsica are in Moravian Museum, Brno, Czech Republic.

#### Distribution

The species is known up to now from Monte Etna in Sicily, Monte Limbara in Sardinia and Bain de Guitera in Corsica.

#### Biology

The populations in Sardinia were found on small shrubs of *Cytisus villosus* Pourret (Fabaceae) in a dry mediterranean forest at about 500 m (in April) and 900 m (in June) respectively, the specimens in Sicily were collected in open forests between 800 and 1650 m (in May and June), and the specimen from Corsica on a meadow with *Olea europaea* L. and *Phillyrea* sp. at 680 m (in April).

#### Derivatio nominis

The name of this species derives from the combination of the host plant genus in Sardinia, *Cytisus*, and its distribution on the islands Sicily, Sardinia and Corsica.

## Discussion

*E. cytinsularis* sp. nov. doubtless belongs to the *melissae* group as defined by Ribaut (1936) on the base of the apical veins in fore wing all emanating from radial cell. In view of the simple apical aedeagus appendages, curved in basal direction and crossing ventrally of the aedeagus shaft (figures 2A, 2B), we consider the new taxon next related to *E. rostrata* Ribaut, *E. melissae* Curtis and *E. andalusiaca* Ferrari. All those species are present in Sicily, Sardinia and Corsica and are distributed prevalently in the west Mediterranean area, only *E. melissae* has a vast area around the whole Mediterranean region and in central and western Europe, in some regions probably introduced only by human impact.

Main differences to the above mentioned four *Eupteryx* species concern the markings of head, the coloration of pronotum, wings and legs and the shape of aedeagus.

*E. cytinsularis* shares most characters with *E. andalusiaca*: (1) the tendency to dark coloration of anteclypeus and margins of frontoclypeus also in males, (2) the tendency of confluence of the dark spots of upper face and vertex, (3) the dark coloration of pronotum and scutellum, (4) quite extended dark areas of the fore wings, (5) the rather long hind tarsus, (6) the fuscous posteroapical region of femora, (7) the (in lateral view) stout aedeagus shaft without dorsal thorn and the (in ventral view) wide aedeagus apex. The two species differ, however, in (1) the extension of the dark coloration of the legs (almost lacking in *E. andalusiaca*, very distinct in *E. cytinsularis*), (2) the shape of the aedeagus apex (straightly cut in *E. andalusiaca*, tapered in *E. cytinsularis*), (3) the markings of upper face and vertex (the confluence of the dark spots creates in *E. andalusiaca* a characteristic pattern of narrow continuous lines, in *E. cytinsularis* wide, irregularly shaped bands, sometimes confluent, sometimes consisting of hardly separated spots, see figures 1A, 1B), (4) the coloration of fore wings (dark areas more extended in *E. cytinsularis*, see figure 1G) and (5) the aedeagus shape (shaft stouter in *E. cytinsularis*).

A close relationship also to *E. rostrata* is implied again by the stout aedeagus shaft, similar shape of apical aedeagus appendages and by the dark coloration pattern on the hind legs of the male (somewhat more extended in *E. cytinsularis*, see figure 1F). Contrary to *E. cytinsularis*, however, *E. rostrata* has an aedeagus with robust dorsal process and displays a light coloration of head, pronotum and wings similar to that of *E. melissae*.

In all the mentioned characters *E. melissae* presents the most distinct differences (light coloration of head, wings, legs, isolated head spots, slender aedeagus shaft, narrow aedeagus apex etc.) and may therefore, within this group of species, represent the taxon less close related to *E. cytinsularis*.

As most *Eupteryx* species feed on Lamiaceae, some taxa also on Asteraceae, Polygonaceae, Apiaceae, Urticaceae etc. (Dworakowska, 1970; 1971; 1972; 1979; Stewart, 1988; Nickel, 2003), the relationship between *E. cytinsularis* and a Fabaceae species as host plant is an interesting exception. Whereas *E. melissae* feeds on several Lamiaceae species, *E. rostrata* uses besides La-

miaceae often also Asteraceae (for instance *Pulicaria dysenterica* (L.) Bernh., see Guglielmino *et al.*, 2005) and *E. andalusiaca* is monophagous on *Dittrichia viscosa* (L.) Greuter (Asteraceae).

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## References

- DELLA GIUSTINA W., 1989.- Homoptères Cicadellidae, 3. In: *Faune de France*, 73.- Fédération Française des Sociétés de Sciences Naturelles et INRA, Paris, France.
- D'URSO V., 1995.- Homoptera Auchenorrhyncha. In: *Checklist delle specie della fauna italiana*, 42 (MINELLI A., RUFFO S., LA POSTA S., Eds).- Calderini, Bologna, Italy.
- DWORAKOWSKA I., 1970.- On the species of *Eupteryx artemisiae* (Kbm.) group (Homoptera, Cicadellidae, Typhlocybinæ).- *Annales Zoologici*, 27 (16): 361-372.
- DWORAKOWSKA I., 1971.- On the North African species of the genus *Eupteryx* Curt. (Hom., Cicadellidae, Typhlocybinæ).- *Annales Entomologici Fennici*, 37 (1): 14-20.
- DWORAKOWSKA I., 1972.- On some species of the genus *Eupteryx* Curt. (Auchenorrhyncha, Cicadellidae, Typhlocybinæ).- *Bulletin de l'Académie Polonaise des Sciences, Série des sciences biologiques*, 20 (10): 727-734.
- DWORAKOWSKA I., 1979.- On some Typhlocybinæ (Auchenorrhyncha, Cicadellidae, Typhlocybinæ).- *Bulletin de l'Académie Polonaise des Sciences, Série des sciences biologiques*, 26 (10): 703-713.
- GUGLIELMINO A., BÜCKLE C., REMANE, R., 2005.- Contribution to the knowledge of the Auchenorrhyncha fauna of Central Italy (Hemiptera, Fulgoromorpha et Cicadomorpha).- *Morbinger Entomologische Publikationen*, 3 (3): 13-98.
- HOCH H., 2004.- *Hemiptera, Cicadomorpha etc.*- Fauna Europaea version 1.1, [online] URL: <http://www.faunaeur.org>
- NICKEL H., 2003.- *The Leafhoppers and Planthoppers of Germany (Hemiptera, Auchenorrhyncha)*.- Pensoft Publishers, Sofia, Bulgaria.
- RIBAUT H., 1936.- Homoptères Auchenorrhynques. I (Typhlocybinæ). In: *Faune de France*, 31.- Fédération Française des Sociétés de Sciences Naturelles, Paris, France.
- STEWART A. J. A., 1988.- Patterns of host-plant utilization by leafhoppers in the genus *Eupteryx* (Hemiptera: Cicadellidae) in Britain.- *Journal of Natural History*, 22: 357-379.

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