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Hypsitylus arberlaitz sp. nov. (Hemiptera: Heteroptera: Miridae) from Aiako Harria (Gipuzkoa, Basque Country, northern Iberian Peninsula)

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Abstract

Hypsitylus arberlaitz sp. nov. (Miridae: Orthotylinae: Orthotylini) is described from the Aiako Harria Nature Reserve (Gipuzkoa, Basque Country, northern Iberian Peninsula). It can be easily separated from *H. prasimus* Fieber, 1861 by its smaller size and by differences in the parameres, among other characters. Some biological data are provided. It lives on the Thymelaeaceae *Daphne cneorum* L.

Key words: *Hypsitylus arberlaitz* sp. nov., Orthotylinae, Miridae, Heteroptera, Aiako Harria Nature Reserve, Basque Country, northern Iberian Peninsula, *Daphne cneorum* L.

Resumen

Hypsitylus arberlaitz sp. nov. (Hemiptera: Heteroptera: Miridae) de Aiako Harria (Gipuzkoa, País Vasco, norte de la Península Ibérica)

Se describe *Hypsitylus arberlaitz* sp. nov. (Miridae: Orthotylinae: Orthotylini) del Parque Natural de Aiako Harria (Gipuzkoa, País Vasco, norte de la Península Ibérica). Se separa con facilidad de *H. prasimus* Fieber, 1861 por su tamaño menor y por diferencias en los parámetros, entre otros caracteres. Se ofrecen algunos datos de su biología. Vive sobre la Thymelaeaceae *Daphne cneorum* L.

Palabras clave: *Hypsitylus arberlaitz* sp. nov., Orthotylinae, Miridae, Heteroptera, Parque Natural de Aiako Harria, País Vasco, norte de la Península Ibérica, *Daphne cneorum* L.

Laburpena

Hypsitylus arberlaitz sp. nov. (Hemiptera: Heteroptera: Miridae), Aiako Harrikoa (Gipuzkoa, Euskal Herria, Iberiar Penintsularen iparralde)

Hypsitylus arberlaitz sp. nov. (Miridae: Orthotylinae: Orthotylini) deskribatzen da, Aiako Harria Parke Naturalekoa (Gipuzkoa, Euskal Herria, Iberiar Penintsularen iparralde). Erraz bereizten da *H. prasimus* Fieber, 1861, besteak beste, tamaina txikiagoa eta parameroen desberdintasunak kontuan harturik. Bere biologiari buruzko zenbait datu ematen dira. *Daphne cneorum* L. Thymelaeaceae landarean bizi da.

Gako-hitzak: *Hypsitylus arberlaitz* sp. nov., Orthotylinae, Miridae, Heteroptera, Aiako Harria Parke Naturala, Euskal Herria, Iberiar Penintsularen iparralde, *Daphne cneorum* L.

Introduction

The orthotyline genus *Hypsitylus* Fieber, 1861 was resurrected by Carapezza (1997) to accommodate the single species *Hypsitylus prasimus* Fieber, 1861, of res-

tricted circum-mediterranean distribution (Kerzhner and Josifov, 1999) and infested to the Thymelaeaceae *Daphne gnidium* L. (Wagner, 1974; Tamanini, 1981; Ehanno, 1987; Carapezza, 1997). The genus is close to *Platycranus* (*Genistocapsus*) and to *Orthotylus* (*Pachy-*

	♂♂		♀♀	
Total length (mm)	3.75	(3.52 – 3.92)	3.49	(3.20 – 3.70)
Joint I of antennae (mm)	0.28	(0.27 – 0.30)	0.28	(0.26 – 0.30)
Joint II of antennae (mm)	1.04	(0.93 – 1.14)	0.94	(0.84 – 0.99)
Joint III of antennae (mm)	0.86	(0.81 – 0.96)	0.84	(0.78 – 0.93)
Joint IV of antennae (mm)	0.44	(0.39 – 0.51)	0.45	(0.39 – 0.48)
Ocular index	2.18	(2.00 – 2.36)	2.84	(2.73 – 3.10)
Pronotum width / length	2.33	(2.25 – 2.41)	2.41	(2.31 – 2.64)
Total length / Pronotum width	3.56	(3.38 – 3.71)	3.24	(2.94 – 3.43)
Head / Pronotum (widths)	0.71	(0.68 – 0.74)	0.72	(0.69 – 0.74)
Joint II of antennae / Pronotum width	0.99	(0.89 – 1.06)	0.87	(0.81 – 0.94)
Joint III / Joint II of antennae	0.83	(0.77 – 0.90)	0.90	(0.81 – 1.00)
Metatibia / Tarsus (lengths)	3.72	(3.29 – 3.93)	3.76	(3.50 – 4.07)
Metatibia length / Pronotum width	1.64	(1.57 – 1.74)	1.56	(1.49 – 1.64)
Metatibia length / Total length	0.46	(0.44 – 0.49)	0.48	(0.45 – 0.54)

TABLE 1. Morphometric values for *Hypsitylus arberlaitz sp. nov.* Average values and ranges of variability are based on 22 specimens of each sex.

lops), from which it can be separated mainly on the basis of the differences in male genitalia.

In a previous paper, Pagola-Carte *et al.* (2005) studied the Miridae of the Aiako Harria Nature Reserve. Subsequent surveys in the area are providing additional, interesting information on the family. As to the present contribution, a new species of the genus *Hypsitylus* is described on specimens collected on *Daphne cneorum* L. in the course of the research programmes concerning that threatened plant.

The Aiako Harria Nature Reserve is located in the northeastern Gipuzkoa, in the Iberian Basque Country and in the Spanish administrative region named Basque Autonomous Community. A brief physical description of the study area was given by Pagola-Carte *et al.* (2005).

Results

Hypsitylus arberlaitz sp. nov.

Type material:

Holotype: ♂, mounted on card, labelled: «Pagogañako soroa / 450 m; *Daphne cneorum* / Irun (Aiako Harria Parke Nat.) / GIPUZKOA 30TXN0195 / 14-06-2006 / S. Pagola Carte *leg.*» (white label); «HOLOTYPE / *Hypsitylus arberlaitz sp. nov.* / Pagola-Carte» (red label). Deposited in the Museu de Ciències Naturals, Barcelona.

Paratypes: 25 ♂♂, 30 ♀♀, mounted on card, as follows: 3 ♂♂, labelled: «Erlaitz / 475 m; *Daphne cneorum* / Irun (Aiako Harria Parke Nat.) / GIPUZKOA 30TXN0095 / 9-06-2006 / S. Pagola Carte *leg.*» (white label); «PARATYPE / *Hypsitylus arberlaitz sp. nov.* / Pagola-Carte» (red label); 1 ♀, labelled: the same, with date: 12-06-2006; 1 ♀, labelled: the same, with date: 14-06-2006; 1 ♂, 7 ♀♀, labelled: the same, with date: 15-06-2006; 1 ♂, 1 ♀, labelled: the same, with date: 23-06-2006; 1 ♂, 1 ♀, labelled: the same, with date: 1-07-2006; 9 ♂♂, 7 ♀♀, labelled: «Pagogañako soroa / 450 m; *Daphne cneorum* / Irun (Aiako Harria Parke Nat.) / GIPUZKOA 30TXN0195 / 14-06-2006 / S. Pagola Carte *leg.*» (white label); «PARATYPE / *Hypsitylus arberlaitz sp. nov.* / Pagola-Carte» (red label); 4 ♂♂, 2 ♀♀, labelled: the same, with date: 15-06-2006; 5 ♂♂, 8 ♀♀, labelled: the same, with date: 19-06-2006; 1 ♂, 2 ♀♀, labelled: the same, with date: 10-07-2006.

Paratypes deposited: 2 ♂♂, 2 ♀♀, in the Museu de Ciències Naturals, Barcelona; 1 ♂, 1 ♀, in the Museo Nacional de Ciencias Naturales, Madrid; 22 ♂♂, 27 ♀♀, in the Pagola-Zabalegui collection, Donostia.

Type locality:

Erlaitz and Pagogaña hills, Irun, in the Aiako Harria Nature Reserve; province of Gipuzkoa; Basque Country; northern Iberian Peninsula.

Description:

Coloration (Figs. 1a-c): Light green to green, usually of teneral appearance partly due to dorsal vestiture; shining teguments. Head and legs green-yellowish; sometimes femora as green as the pronotum and hemelytra. Pronotum uniformly green; calli well marked;

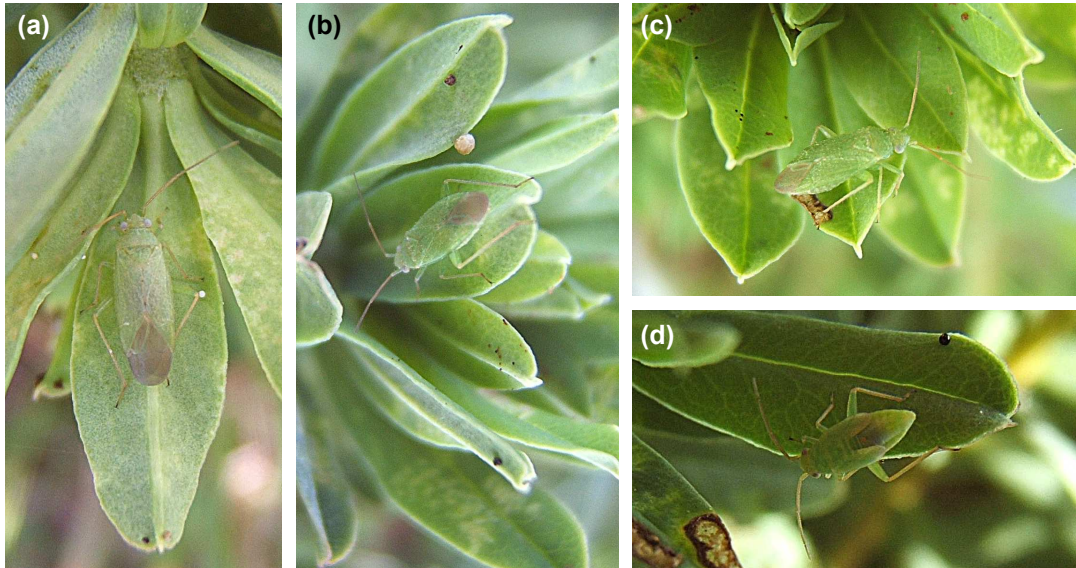


FIGURE 1. *Hypsitylus arberlajtzi* sp. nov. on *Daphne cneorum* L.: (a) male; (b)-(c) females; (d) nymph.

anterior margin weakly concave medially. Scutellum turning to yellowish in dry specimens, particularly its basis in females. Lateral margins straight or somewhat sinuous. Antennae yellowish or ochraceous; 1st joint and most usually also basal half of 2nd joint tinged with green. Last joint of rostrum blackish in its apical half. Tibial spines pale, yellowish or slightly brownish. Tarsi mostly pale, 3rd tarsomere enbrowned apically. Membrane uniformly grey, with green veins.

Dorsal vestiture pale, with semierect, longer, brownish hairs interspersed, these ones more abundant in certain specimens and, in general, in males. A pair of longer hairs at each of the anterior angles of pronotum. First joint of antennae with three long bristles, two arising from its inner surface and the other more dorsally.

Morphometry (see Table 1 for more details, including average values): Body length: 3.52–3.92 mm ($\sigma\sigma$); 3.20–3.70 mm ($\rho\rho$). Body elongate to elongate-oval, 3.38–3.71 ($\sigma\sigma$) and 2.94–3.43 ($\rho\rho$) times longer than basal width of pronotum. Head around 0.71 ($\sigma\sigma$) and 0.72 ($\rho\rho$) times as broad as pronotum. Posterior margin of vertex lacking carina. Ocular index 2.00–2.36 ($\sigma\sigma$) and 2.73–3.10 ($\rho\rho$). Rostrum reaching the middle of mesosternum, rarely a bit longer; 3rd and 4th joints slightly swollen. Length of antennal joints (averages): 0.28–1.04–0.86–0.44 mm ($\sigma\sigma$) and 0.28–0.94–0.84–0.45 mm ($\rho\rho$); 2nd joint 0.89–1.06 ($\sigma\sigma$) and 0.81–

0.94 ($\rho\rho$) times longer than basal width of pronotum; 3rd joint 0.77–0.90 ($\sigma\sigma$) and 0.81–1.00 ($\rho\rho$) times as long as 2nd one. Pronotum 2.25–2.41 ($\sigma\sigma$) and 2.31–2.64 ($\rho\rho$) times as broad as centrally long. Hemelytra distinctly longer than abdomen in both sexes. Metatibia 3.29–3.93 ($\sigma\sigma$) and 3.50–4.07 ($\rho\rho$) longer than tarsus (excluding ongles), 1.57–1.74 ($\sigma\sigma$) and 1.49–1.64 ($\rho\rho$) as broad as basal width of pronotum, and 0.44–0.49 ($\sigma\sigma$) and 0.45–0.54 ($\rho\rho$) as long as total body length.

Male genitalia (Figs. 2a, 3a and 4): right paramere (Fig. 2a) short and broad, with two horn-like, tapering, apical «processes» (actually, the tip of the hypophysis and a true processus); left paramere (Fig. 3a) curved or somewhat twisted, tapering apically, and not bifurcate; sclerotized processes of the vesica as in Fig. 4: one of them robust and lanceolate, the other broader and irregularly toothed on both margins of the apical third-fourth.

Female genitalia (Figs. 5a-b): dorsal wall of the gynatrial complex as in Fig. 5a, with the sclerotized rings elongate, the lateral oviducts long, transverse, and the vermiform gland quite long; K structure of the posterior wall (Fig. 5b) densely toothed in almost all its surface, somewhat variable in length and shape but sharing, in all the specimens examined, a barrel-like shape with a distinct anterior tip on the outer margin.

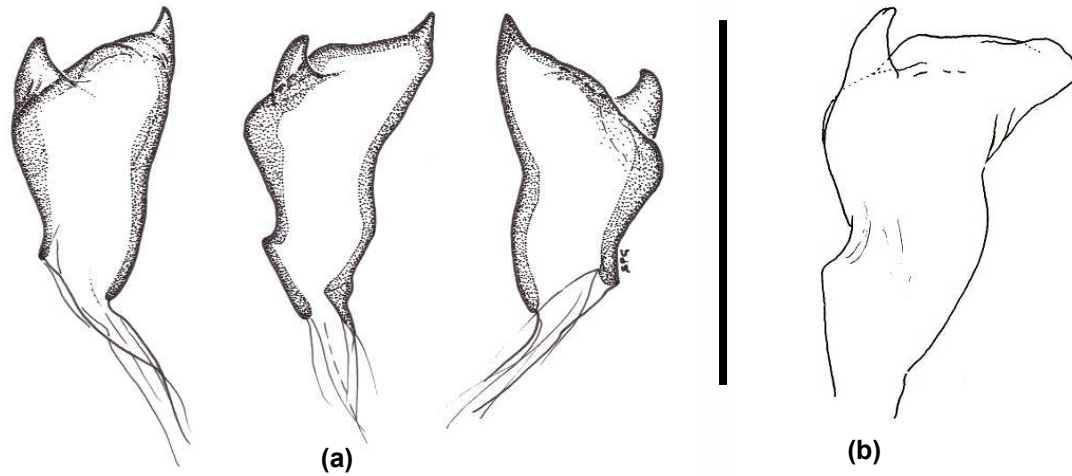


FIGURE 2. Right paramere (male genitalia) of: (a) *Hypsitylus arberlaitz sp. nov.*: different views and/or specimens; (b) *H. prasinus* Fieber, 1861 (reproduced from Carapezza, 1997) (Scale bar = 0.2 mm, both (a) and (b)).

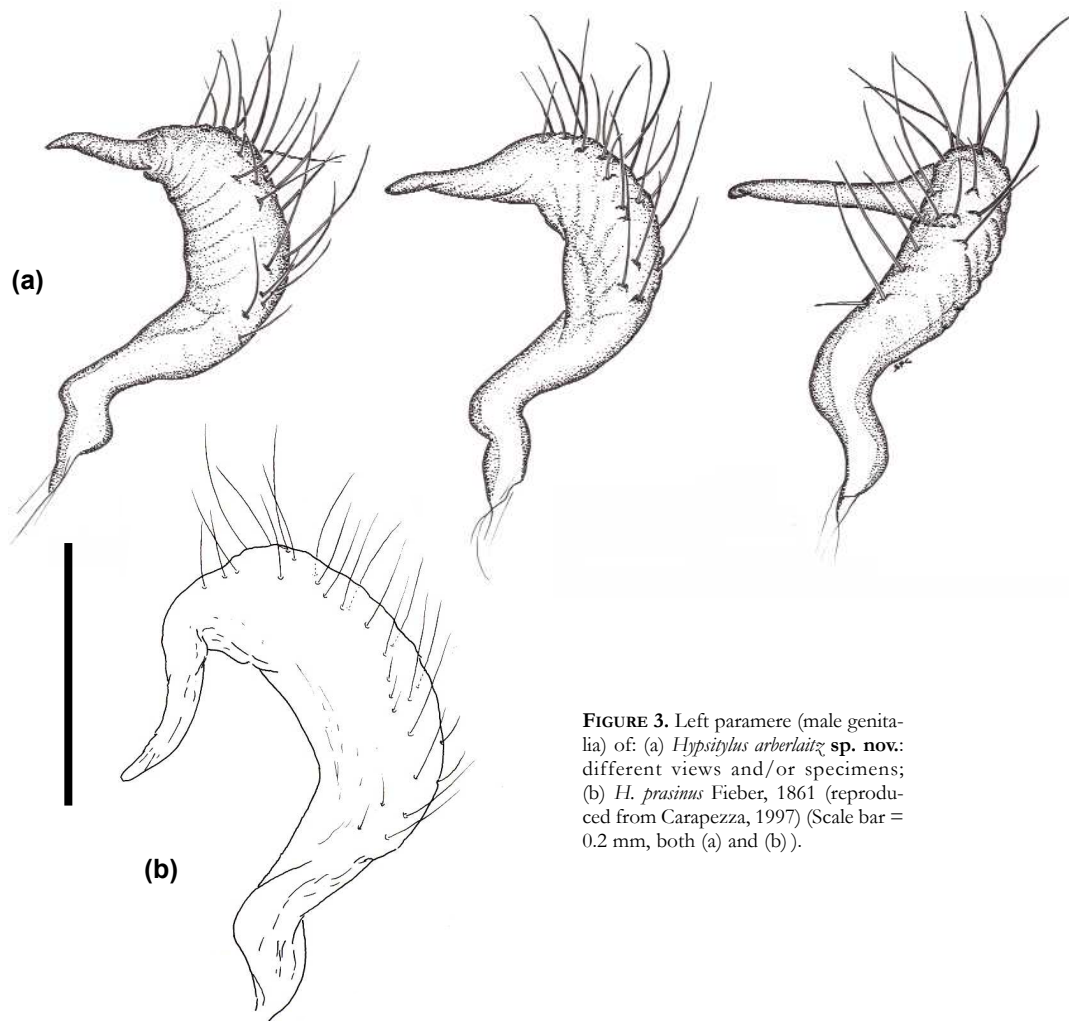


FIGURE 3. Left paramere (male genitalia) of: (a) *Hypsitylus arberlaitz sp. nov.*: different views and/or specimens; (b) *H. prasinus* Fieber, 1861 (reproduced from Carapezza, 1997) (Scale bar = 0.2 mm, both (a) and (b)).

Etymology:

I have the pleasure of dedicating this species to my good friend the botanist Estibaliz Arbelaitz, to whom we all owe a great debt for her work studying and protecting *Daphne cneorum* L. The specific epithet of the new taxon (*arberlitz*) is an invariable noun in apposition formed by combination of her surname (Arbelaitz) and the toponym of the type locality (Erlaitz).

Biology:

Hypsitylus arberlitz sp. nov. lives on the Thymelaeaceae *Daphne cneorum* L. (common name: «Garland flower» in English, «San Marko lorea» in Basque). Nymphs have been observed over the whole month of June; adults, between June 9 and July 10, males being more abundant than females during the first week of that period. In July, almost only a few female specimens could be found. The first female with eggs has been detected as soon as June 14.

Among the Miridae, adults of *Capsodes flavomarginatus* (Donovan, 1798) and *Horistus (Primiboristus) orientalis* (Gmelin, 1790) have also been observed as accompanying fauna on the same plants, their development occurring there some weeks before. Concerning the Nabidae, nymphs of *Himacerus (Aptus) mirmicoides* (O. Costa, 1834) and adults of *Nabis (Nabis) rugosus* (Linnaeus, 1758) and *Nabis (Nabis) pseudoferus ibericus* Remane, 1962 have been recorded. Moreover, the predatory effect of the latter upon the orthotyline has been verified *in situ*. The occurrence of other Heteroptera species on *Daphne cneorum* L. should be considered accidental (for example, the Pentatomidae *Piezodorus lituratus* (Fabricius, 1794) and the Tingidae *Dictyonota strichnocera* Fieber, 1844), since they belong to the typical fauna of the adjacent *Ulex* spp.

Some observations on its behaviour have also been carried out. Both adults and nymphs exhibit a high ability to hide in the basal parts of the shrubs, fast running down along the stems even when the smallest perturbation is perceived (the author had the opportunity to observe such movements from a distance of 1–2 metres by walking slowly and in total silence). Likewise, they often look for protection among the tight leaves of the apical rosettes (see photographs on Fig. 1). It is likely that nymphs mainly feed on those parts. In addition, given the low availability of potential preys living on the plant, which is highly toxic, phytophagy may be assumed as the main feeding type.

In hot days, *H. arberlitz* sp. nov. virtually disappeared during the central hours of the day. This phenome-

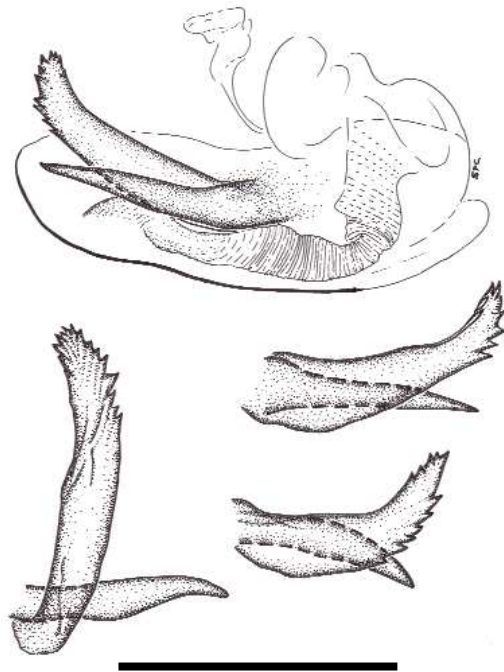


FIGURE 4. Male genitalia of *Hypsitylus arberlitz* sp. nov.: sclerotized processes of the vesica, different views and/or specimens (Scale bar = 0.2 mm).

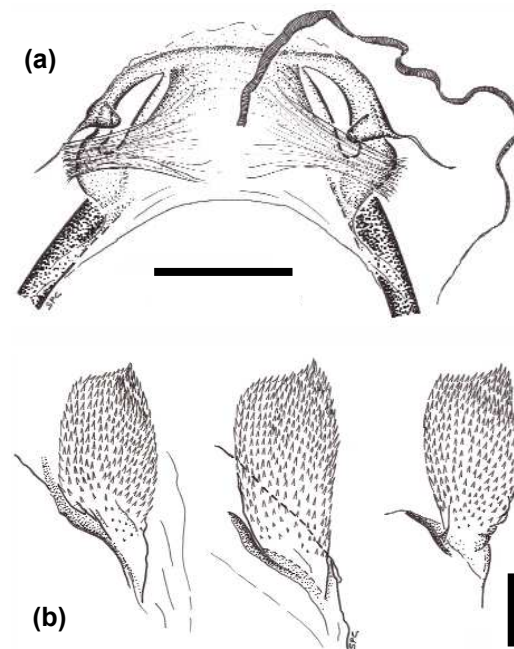


FIGURE 5. Female genitalia (gynatrial complex) of *Hypsitylus arberlitz* sp. nov.: (a) Dorsal wall (Scale bar = 0.2 mm); (b) K structure of the posterior wall (Scale bar = 0.05 mm).

non could, however, be influenced by the abnormal high temperatures recorded in June 2006. On the other hand, differences between north- and south-facing slopes and even among individual shrubs have been detected in relation to the development of the mirid. Finally, a «mate guard» behaviour has been observed once, by which a male tried to protect a female by moving forward, exposing itself to the observer and giving the female time to run away.

Distribution:

So far, the known distribution of *H. arberlaitzi* sp. nov. is limited to the type locality in the Aiako Harria Nature Reserve (Irun, Gipuzkoa) and to Manttale mountain (Bera, Nafarroa, UTM 30TXN09), separated by 5 km from the type locality and where *Daphne cneorum* L. also grows. In Manttale, a similar population of the mirid was observed (23 June 2006) and communicated by E. Arberlaitz, who also collected some specimens. Further search for the species in the Ason valley (Cantabria, Spain) on 3 July has been unsuccessful (pers. comm. by E. Arberlaitz).

Besides Gipuzkoa, Nafarroa and Cantabria, in the Iberian Peninsula *Daphne cneorum* L. also grows in a small number of localities of Bizkaia, Soria and the Pyrenees (Huesca, Lleida and Girona), always occupying rather small areas. Being a south European orophyte, it occurs as well in other mountains of the continent. It is likely that *H. arberlaitzi* sp. nov. will be found in some of those areas. It seems, however, that the distributions of both *H. arberlaitzi* sp. nov. and its host *Daphne cneorum* L. would not overlap those of their related taxa *H. prasinus* Fieber, 1861 and *Daphne gnidium* L., suggesting the possibility of a somewhat parallel history of speciation.

Discussion

A number of diagnostic features undoubtedly place *H. arberlaitzi* sp. nov. within the genus *Hypsitylus* Fieber, 1861 (see Carapezza, 1997): (1) The last two joints of rostrum are slightly swollen; (2) General coloration is light green; (3) Hair covering (vestiture) and tibial spines are pale; (4) Male genitalia is of the same type as in *H. prasinus* Fieber, 1861. Specifically, both the shape of the right paramere (short and broad) and the presence of sclerotized processes in the vesica separate it from the species belonging to *Platycranus* (*Genistocapsus*). On the other hand, the shape of the

left paramere (not bifurcate and resembling a croissant) distinguishes it from *Orthotylus* (*Pachylops*); (5) Finally, the biology of the species belonging to those related genera strictly depends on Leguminosae hosts, whereas *Hypsitylus* does on *Daphne* (Thymelaeaceae).

H. arberlaitzi sp. nov. is very close to *H. prasinus* Fieber, 1861, from which it can be easily separated by the smaller size (in *prasinus*: 4.1–4.8 mm (♂♂) and 4.2–4.8 mm (♀♀); Wagner, 1974; Carapezza, pers. comm.; J. Ribes, pers. comm.) and by differences in the shape of parameres (see illustrations for *prasinus* in Figs. 2b and 3b, reproduced from Carapezza, 1997). Concerning the right paramere, in addition to the single horn (the true processus at the basis of the hypophysis) exhibited by *H. prasinus* Fieber, 1861 (Fig. 2b), a second tapering tip (in fact, the apex of the hypophysis) is present in *H. arberlaitzi* sp. nov. (Fig. 2a). As to the left paramere, the apical portion in *H. arberlaitzi* sp. nov. is not as strongly curved as in *H. prasinus* Fieber, 1861 (Fig. 3b). In fact, it takes a quite straight shape in almost all positions (Fig. 3a).

In addition, some other morphometric differences exist between both species of *Hypsitylus*. In *H. prasinus* Fieber, 1861, the ratio «2nd joint of antennae / width of pronotum» (always more than 1; see Wagner, 1974; Goula, 1986) is higher than in *H. arberlaitzi* sp. nov. On the other hand, the ratio «width of head / width of pronotum» is 0.63 (♂♂) and 0.67 (♀♀) in *H. prasinus* Fieber, 1861 (Wagner, 1974), which makes a meaningful difference with respect to *H. arberlaitzi* sp. nov., given the high constancy of such ratio (see ranges of variation in Table 1).

Biological differences (host plant) between both taxa are also of relevance. The new species corroborates the connection between the mirid genus *Hypsitylus* and the Thymelaeaceae plants of the genus *Daphne*.

Conservation:

It would be desirable to take into account the extremely reduced occupation area of *Daphne cneorum* L. in the study area (Arberlaitz *et al.*, 2002) in order to protect, together with its host, the plant bug as well.

Acknowledgements

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community on *Daphne cneorum* L. The photographs of Fig. 1 were taken by E. Arbelaitz, who also made some crucial field observations. Two anonymous referees critically read the manuscript, improving it considerably. I also thank M. A. Alonso-Zarazaga for nomenclatorial advice. The study was founded by the Gipuzkoa Foral Council.

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