

NOTES ON THE GENUS *AGAPANTHIA* SERVILLE, 1835 (COLEOPTERA: CERAMBYCIDAE: LAMIINAE: AGAPANTHIINI)

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Abstract: A new systematic arrangement of the genus *Agapanthia* Serville, 1835 is proposed based on the shape of the male genitalia (tegmen); two subgenera are recognized, *Agapanthia* s. str. (type species: *Saperda cardui* Fabricius, 1801) and *Epopetes* Gistel, 1857 (type species: *Saperda asphodeli* Latreille, 1804). The three new genera, *Synthapsia* (type species: *Saperda kirbyi* Gyllenhal, 1817), *Chionosticta* (type species: *Agapanthia niveisparsa* Holzschuh, 1981) and *Agapanthoplia* (type species: *Agapanthia coeruleipennis* Frivaldszky, 1878) and the six new subgenera, *Agapanthia* subg. *Smaragdula* (type species: *Saperda violacea* Fabricius, 1775, A. subg. *Homoblephara* (type species: *Saperda maculicornis* Gyllenhal, 1817), A. subg. *Stichodera* (type species: *Saperda irrorata* Fabricius, 1787), A. subg. *Drosotrichia* (type species: *Saperda annularis* Olivier, 1795), A. subg. *Amurobia* (type species: *A. amurensis* Kraatz, 1879) and A. subg. *Agapanthiella* (type species: *Cerambyx villosoidescens* Degeer, 1775), recently introduced by Pesarini & Sabbadini (2004) and based on individual similarities without phylogenetic relationship are regarded as synonyms of the two already existing subgenera. Characters to separate *A. cardui* (Linnaeus, 1767) and *A. suturalis* (Fabricius, 1787) are illustrated. The synonymies *A. cardui* (Linnaeus, 1767) = *A. pannonica* Kratochvil, 1985 and *A. suturalis* (Fabricius, 1787) = *A. ruficornis* Pic, 1918 are confirmed. *A. suturalis* and *A. intermedia* Ganglbauer, 1884 are recorded from the Iberian Peninsula, the latter for the first time.

Key words: Coleoptera, Cerambycidae, *Agapanthia*, *Epopetes*, new synonymy, new records.

Notas sobre el género *Agapanthia* Serville, 1835 (Coleoptera: Cerambycidae: Lamiinae: Agapanthiini)

Resumen: Se propone una nueva sistemática del género *Agapanthia* Serville, 1835 sobre la base de la forma de la genitalia masculina (tegmen); se reconocen dos subgéneros, *Agapanthia* s. str. (especie tipo: *Saperda cardui* Fabricius, 1801) y *Epopetes* Gistel, 1857 (especie tipo: *Saperda asphodeli* Latreille, 1804). Los tres nuevos géneros *Synthapsia* (especie tipo: *Saperda kirbyi* Gyllenhal, 1817), *Chionosticta* (especie tipo: *Agapanthia niveisparsa* Holzschuh, 1981) y *Agapanthoplia* (especie tipo: *Agapanthia coeruleipennis* Frivaldszky, 1878), así como los seis nuevos subgéneros *Agapanthia* subg. *Smaragdula* (especie tipo: *Saperda violacea* Fabricius, 1775, A. subg. *Homoblephara* (especie tipo: *Saperda maculicornis* Gyllenhal, 1817), A. subg. *Stichodera* (especie tipo: *Saperda irrorata* Fabricius, 1787), A. subg. *Drosotrichia* (especie tipo: *Saperda annularis* Olivier, 1795), A. subg. *Amurobia* (especie tipo: *A. amurensis* Kraatz, 1879) y A. subg. *Agapanthiella* (especie tipo: *Cerambyx villosoidescens* Degeer, 1775), introducidos recientemente por Pesarini & Sabbadini (2004) y basados en semejanzas individuales sin relación filogenética, se consideran sinónimos de los dos ya existentes. Se ilustran caracteres que separan *A. cardui* (Linnaeus, 1767) y *A. suturalis* (Fabricius, 1787). Se confirman las sinonimias *A. cardui* (Linnaeus, 1767) = *A. pannonica* Kratochvil, 1985 y *A. suturalis* (Fabricius, 1787) = *A. ruficornis* Pic, 1918. Se cita a *A. suturalis* y *A. intermedia* Ganglbauer, 1884 de la Península Ibérica, el segundo por primera vez.

Palabras clave: Coleoptera, Cerambycidae, *Agapanthia*, *Epopetes*, nueva sinonimia, nuevas citas.

Introduction

The genus *Agapanthia* was introduced by Serville (1835) who originally recognized two “divisions”: *Phoebe* Serville, 1835, currently in *Hemilophini* Thomson, 1868 and *Agapanthia* s.str. which included four species: *Saperda cardui* Fabricius, 1801 (= *Cerambyx cardui* Linnaeus, 1767), *S. asphodeli* Latreille, 1804, *S. suturalis* Fabricius, 1787 and *S. irrorata* Fabricius, 1787; the type species is *S. cardui* Fabricius, designated by Westwood (1838). Gistel (1848) introduced *Segmentaria*, an unnecessary new name for *Agapanthia* based on a non-existent homonymy (he cited *Agapanthus* Redout, botanical genus of Liliaceae); *Segmentaria* Gistel, 1848 is in fact a homonym of *Segmentaria* Swainson, 1840 (Mollusca). Gistel (1856) created the new genus *Eucrius* for *E. cardui* and *E. marginellus* [= *Calamobius filum* (Rossi, 1790)]. The former, selected as the type species by Vives & Alonso Zarazaga (2000) makes *Eucrius* an objective synonym of *Agapanthia*. Gistel (1857a,b) described the new genus *Epopetes* for *Saperda asphodeli*, type species by original designation and monotypy. All these genera were neglected until Aurivillius (1923) who listed

them as synonyms of *Agapanthia*. Plavilstshikov (1930), recognized forty species belonging to the genus *Agapanthia*, which, in order to facilitate their identification, he separated into ten species groups regardless of phylogenetic affinities. The structure of female genitalia was introduced as possible diagnostic characters by Sama (1979) and later on by Hernandez (1992); the complex of characters of male and female genitalia were further developed by Bahillo (1994, 1996) who, in his study of about 25 species of *Agapanthia*, proposed to divide the genus into three groups according to the shape of tegmen in males and the spermatheca and ovipositor in females. In a recent article, Pesarini & Sabbadini (2004) revised again the genus and, overlooking the taxa of Gistel and the previous studies, introduced three new monotypic genera and five new subgenera (some of them monotypic), trying to prove phylogenetic affinities, in fact naming nearly all groups previously indicated by Plavilstshikov, on the basis of morphological similarities more than true phylogenetic relationship.

Pesarini & Sabbadini (2004) described the following new genera:

- *Synthapsia* - type species: *Saperda Kirbyi*, Gyllenhal, 1817, based on the shape of terminal tarsal joint ("onychium") (V group of Plavilstshikov, partim) (monotypic).
- *Chionosticta* - type species: *Agapanthia niveisparsa* Holzschuh, 1981, based on the shape of pronotum (monotypic).
- *Agapanthoplia* - Type species: *Agapanthia coeruleipennis* Frivaldszky, 1878, based on the shape of pronotum (II group of Plavilstshikov) (monotypic).

Moreover, they divided the genus *Agapanthia* Serville into seven subgenera, six of them described as new.

- *Agapanthia* s.str. - Type species: *Cerambyx cardui* Linnaeus, 1767 (in fact, the type species is *Saperda cardui* Fabricius, 1801) (IX group of Plavilstshikov); the authors included in this subgenus two further species: *A. suturalis* (Fabricius) and *A. ruficornis* Pic, 1918 revalidated as distinct species. These taxa and their synonymies will be commented below.
- *Agapanthia* subg. *Smaragdula* - Type species: *Saperda violacea* Fabricius, 1775 (II group of Plavilstshikov), chiefly based on metallic integument and distal segments of antennae not annulated. To the same subgenus they included all species with blue metallic integument as well as *A. fallax* Holzschuh, 1989, later on moved by the same authors to the following subgenus.
- *Agapanthia* subg. *Homoblephara* - Type species: *Saperda maculicornis* Gyllenhal, 1817 (II group of Plavilstshikov) including *A. orbachi* Sama, 1993, *A. davidi* Sláma, 1986 and *A. korostelevi* Danilevsky, 1987.
- *Agapanthia* subg. *Stichodera* - Type species: *Saperda irrorata* Fabricius, 1787 (IV group of Plavilstshikov), based on the shape of pronotal sculpture and elytral pubescence. *A. soror* Kraatz, 1882, included in the same subgenus, despite its similarity, is in fact unrelated to *A. irrorata*.
- *Agapanthia* subg. *Drosotrichia* - Type species: *Saperda annularis* Olivier, 1795 (V group of Plavilstshikov, partim), based on the shape of elytral pubescence and missing median longitudinal strip of pubescence of pronotum (monotypic).
- *Agapanthia* subg. *Amurobia* - Type species: *A. amurensis* Kraatz, 1879 (III group of Plavilstshikov), based on the metallic integument, rounded elytral apex and antennal segments with tufts of condensed hairs. Besides the type species, three species are included: *A. pilicornis* (Fabricius, 1787), *A. japonica* Kano, 1933 and *A. yagii* Hayashi, 1982.
- *Agapanthia* subg. *Agapanthiella* - Type species: *Cerambyx villosiviridescens* Degeer, 1775. This genus includes all the remaining species not included in the previous subgenera (V group of Plavilstshikov, partim).

Discussion

The classification proposed by Pesarini & Sabbadini (2004), in fact an updated version of that of Plavilstshikov (1930),

is obviously unsatisfactory; the "groups" proposed by the latter and named by the former are clearly based on morphological structures (such as integument more or less shining metallic, elytral pubescence and antennal segments with more or less developed tufts or hairs), without any supraspecific value and unstable within the groups and even individually.

Moreover, both revisions totally neglected the study of male and female genitalia which, as also showed in previous articles (Sama, 1979; Hernandez, 1992; Bahillo, 1994, 1996), are probably the best characters for the phylogenetic analysis of this genus.

A complete analysis of these structures is beyond the scope of the present note; I will only give a short account on the male and female genitalia, namely the tegmen of the aedeagus, which allows the recognition of two major groups of clearly related species, which I currently prefer to treat as subgenera and whose names already existing in literature, namely *Agapanthia* Serville, 1835 s.str. and *Epoetes* Gistel, 1857.

The discovery of the peculiar shape of tegmen is due to Bahillo de la Puebla (1994), who, studying the Spanish *Agapanthia*, firstly suggested its importance as a possible diagnostic character.

I propose here the following new systematic of the genus *Agapanthia*:

- *Agapanthia* Serville, 1835 s.str. Type species: *Saperda cardui* Fabricius, 1801 (= *Cerambyx cardui* Linnaeus, 1767), designated by Westwood (1840).
= *Eucrius* Gistel, 1856, Myst. Eur. Insectenw.: 376.
Type species: *Cerambyx cardui* Linnaeus, 1767 (designated by Vives & Alonso Zarazaga, 2000).
= *Agapanthia* sbg. *Smaragdula* Pesarini & Sabbadini, 2004. Type species: *Saperda violacea* Fabricius, 1775 **syn. n.**
= *Agapanthia* sbg. *Homoblephara* Pesarini & Sabbadini, 2004. Type species: *Saperda maculicornis* Gyllenhal, 1817 **syn. n.**

This subgenus includes the following three groups of species:

- *Agapanthia cardui* and *A. suturalis* (Fabricius, 1787);
- *A. violacea* (Fabricius, 1775) and related species: in fact all species previously assigned to the group I of Plavilstshikov (1930) and to *Smaragdula* Pesarini & Sabbadini except *A. fallax* Holzschuh, 1974;
- *A. maculicornis* (Gyllenhal, 1817) and related species, including *A. orbachi* Sama and *A. fallax* Holzschuh 1974.

The distinctive shape of tegmen, with manubrium fused at the base (Fig.1-3) will easily separate this subgenus; in addition, the lateral lobes are usually elongate and narrow, digitiform and convex apically in *A. cardui* and *A. violacea* and related species, more or less elongate in *A. maculicornis* and *A. korostelevi*, broader, not very different from the species of the following subgenus in *A. orbachi*.

The valvae of ovipositor (styli are absent) are obliquely truncate or emarginate and shorter than the following subgenus, the sensorial area of the coxite placed apically (Fig. 12).

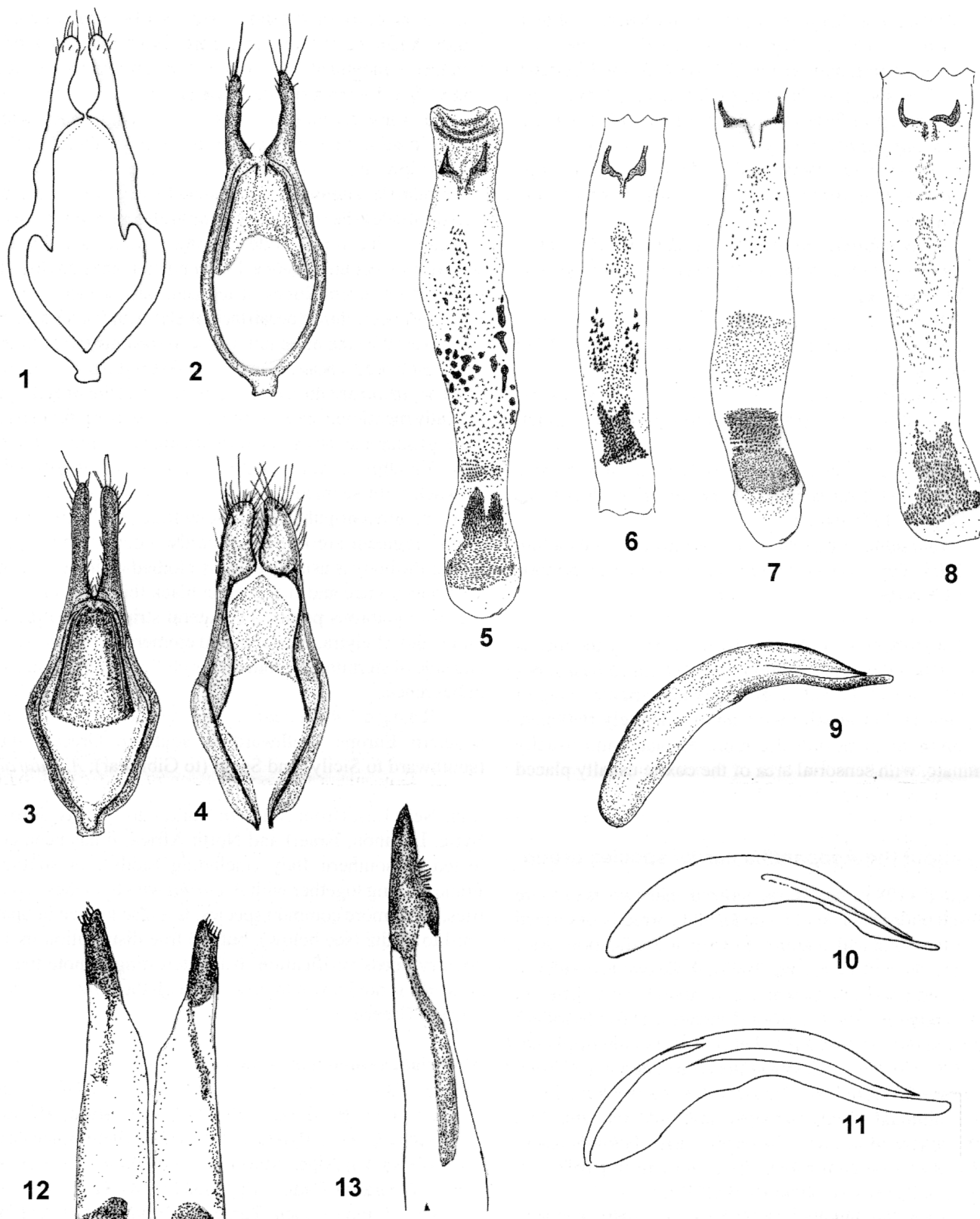


Fig. 1-4. Male genitalia (tegmen) of: **1.** *Agapanthia* (s.str.) *cardui* (Linnaeus), Terranova del Pollino (Italy). **2.** *Agapanthia* (s.str.) *violacea* (Fabricius), Dalmatia: Orebic (Croatia). **3.** *Agapanthia* (s.str.) *intermedia* Ganglbauer, Lerida: Graus, Valcarlos (Spain). **4.** *Agapanthia* (*Epoptes*) *annularis* (Olivier), Libya.

Fig. 5-8. Male genitalia (endophallous) of: **5.** *Agapanthia* (s.str.) *cardui* (Linnaeus), Terranova del Pollino (Italy); **6.** *Agapanthia* (s.str.) *cardui* (Linnaeus), Liguria; **7.** *Agapanthia* (s.str.) *suturalis* (Fabricius), Oujda (Morocco); **8.** *Agapanthia* (s.str.) *suturalis* (Fabricius), Drôme (France).

Fig. 9-11. Male genitalia (median lobe) (lateral view) of: **9.** *Agapanthia* (s.str.) *suturalis* (Fabricius), Oujda (Morocco); **10.** *Agapanthia* (s.str.) *suturalis* (Fabricius), Drôme (France); **11.** *Agapanthia* (s.str.) *cardui* (Linnaeus), Liguria : Dolceacqua (Italy).

Fig. 12-13. Female genitalia (ovipositor, coxites) of: **12.** *Agapanthia* (s.str.) *cardui* (Linnaeus), Terranova del Pollino (Italy); **13.** *Agapanthia* (*Epoptes*) *angelicae* Reitter, Iran.

- *Agapanthia* sbg. *Epoptes* Gistel, 1857a, Vacuna, 2: 605.
Type species: *Saperda asphodeli* Latreille, 1804 (original designation), not *Cerambyx cardui* Linnaeus, 1767 as stated by Pesarini & Sabbadini (2004).
= *Synthapsia* Pesarini & Sabbadini, 2004. Type species: *Saperda kirbyi* Gyllenhal, 1817 **syn. n.**
= *Chionosticta* Pesarini & Sabbadini, 2004. Type species: *Agapanthia niveisparsa* Holzschuh, 1981 **syn. n.**
= *Agapanthoplia* Pesarini & Sabbadini, 2004. Type species: *Agapanthia coeruleipennis* Frivaldszky, 1878 **syn. n.**
= *Agapanthia* sbg. *Stichodera* Pesarini & Sabbadini, 2004. Type species: *Saperda irrorata* Fabricius, 1787 **syn. n.**
= *Agapanthia* sbg. *Drosotrichia* Pesarini & Sabbadini, 2004. Type species: *Saperda annularis* Olivier, 1795 **syn. n.**
= *Agapanthia* sbg. *Agapanthiella* Pesarini & Sabbadini, 2004. Type species: *Cerambyx villosiviridescens* Degeer, 1775 **syn. n.**
= *Agapanthia* sbg. *Amurobia* Pesarini & Sabbadini, 2004. Type species: *Agapanthia amurensis* Kraatz, 1879 **syn. n.**

This subgenus is chiefly characterized by the manubrium of the tegmen divided into two separated basal apodemes (Fig. 4); the lateral lobes are rather variable, more or less elongate, but usually wide and moderately flattened. The valvae of ovipositor are more elongate and usually acuminate, with sensorial area of the coxite usually placed laterally (Fig. 13) (but there are exceptions).

Note about the *Agapanthia cardui* species group

Kratochvíl (1985), firstly recognized that two taxa were confused under the name *A. cardui* and correctly described some morphological features to their identification. As I have recently written (Sama, 2002), these two taxa refer to two different phenotypes which correspond to two different species, respectively *A. cardui* (Linnaeus, 1767) (northern phenotype) and *A. suturalis* (Fabricius) (southern phenotype). I have recently examined the type material of *Cerambyx cardui* described by Linnaeus; this is a male, well preserved, although partly damaged and well recognizable, which exactly agrees with the beetle currently known as *A. cardui*, therefore confirming the synonymy regarding *A. pannonica* Kratochvíl, 1985 (Sama, 2002).

Agapanthia velox Gistel 1857 has recently been synonymized with *A. cardui* (Vives & Alonso-Zarazaga, in Vives, 2000); according to the original description ("abdominis segmentis analibus femoribusque rubescenti-flavis") this synonymy appears rather doubtful. If it really belongs to the *A. cardui* / *suturalis* complex, then it should refer to the latter.

Because of its original description ("*Antennis plus minusve rufescentibus*") *A. cardui* var. *ruficornis* Pic, 1918, must be regarded as an unavailable name with infrasubspecific rank (ICZN, 1999, Article 45.6.1); this taxon was subsequently raised to the specific level by Pesarini & Sabbadini (2004) who must be therefore deemed as the author (ICZN, 1999, Article 45.5.1). Specimens with more or less

reddish antennal segments occur nearly everywhere in North Africa (and, although more rarely, also in Sicily) together with typical *A. suturalis*, therefore it does represent just a "form" of this species (**syn. n.**).

A. suturalis is very similar to *A. cardui* but usually well distinguishable by its elongate body, elytra clothed with yellowish pubescence and tapering behind, with apices more acutely attenuate, sometimes nearly "caudate"; the ventral side of the scape is more densely clothed with short erect setae, the ventral side of body more densely clothed with recumbent pubescence. Further differences, such as the shape of the lateral lobes of tegmen, pubescence more or less densely clothing the surface of elytra and antennae, are rather variable and often not usable to separate the two taxa. The best unequivocal characters to distinguish *A. suturalis* from *A. cardui* are the shape of the median lobe of aedeagus (already mentioned by Kratochvíl) (Fig. 9-11) and the number and shape of sclerites of its internal sac (Fig. 5-8).

Variability. Antennae of *A. suturalis* are usually totally black with segments from the 3rd largely clothed with white recumbent pubescence, sometimes the scape, rarely the 4th segment are largely or partly reddish. The ventral part of the body is usually densely clothed with grey recumbent pubescence and sparse erect black thin setae originating from glabrous points. The lateral stripes of the pronotum, sides of elytra, episterna and epimera of mesosternum and side of sternites are sometimes clothed with ochraceous pubescence.

Range. *A. cardui* is widespread in central and southern Europe southward to southern Greece, Italy (southward to Sicily) and Spain (to Gibraltar); *A. suturalis* is a common species in Turkey (northward to Erzincan), Iran, Near East (from southern Turkey to Cyprus, Jordan, Syria, Lebanon, Israel) and North Africa; it has been collected in southern Italy (including Sicily), in southern France, living together with *A. cardui* which, in these countries, is the more common species. It is also known in Spain until to Cadiz (see below), but the true distribution in this country needs verification. It is interesting to note that *A. suturalis* is not known to occur through the Balkans or continental Greece.

Material examined of *Agapanthia suturalis*:

France – Bouches-du-Rhône: Marseille (MNHN) ; Gard: Guemare (?) (CCECL) ; Drôme : St. Restitut; Hérault: Rieussec (CCECL); Pyrénées-Orientales: Banyuls-sur-Mer, V.81 (CCECL); Alpes-Maritimes: Valbonne, leg. C. Cocquempot; **Spain** – Cadiz: Algeciras (ZSM); Granada: Guejar; Jaen: 20 km. S. Jaen; Zaragoza: Bujaraloz; Barcelona: Prats de Llobregat; Lerida : Prullans ; Huesca: Ainsa; Tarragona: Prades (!); **Canary Isl.** – Tenerife: El Sabinar (!); La Palma: El Taebledo (DEI); **Portugal** – Algarve: Arao env.(CPS); Monchique, III (CPS); Alto Alentejo: Avis (!); Serta (TZMB); Redondo, Cinfaes, Torres Vedras, Almado-vardo, TZMB); Bencatel (all leg. Podlussany, in TZMB). **Italy** – Sardinia: several localities all in the southern-eastern part of the island; distribution to verify. Sicily: several localities, often syntopic with *A. cardui* which appears more common and widespread; **Malta**: Bateria, St. Thomas Bay (leg. D. Mifsud); **Greece** – Samos, Is. Koos: Aspediou, dint. Zipari, leg. A. Liberto; **Cyprus**: several localities. In addition, I have examined many specimens from Turkey, Iran,

Syria, Jordan, Lebanon, Israel, Libya, Tunisia, Algeria, Morocco.

Agapanthia intermedia in Spain

This species has often been regarded as a form or a synonym of *A. violacea* (even recently by Vives, 2000); however, its specific status is supported by the morphology and bionomics of the immature stages (Švácha (2001). The larvae are known to develop in stems of *Knautia* (on *K. dipsacifolia* (Host) Kreutzer (Dipsacaceae) in southern France, J. Carrière, pers. comm.). Adults can be separated by elytra and antennae covered by whitish pubescence.

As I have recently wrote (Sama, 2002), the distributional range of *A. intermedia* needs verification. *A. intermedia* has been recorded from Germany, Czechia, Slovakia, Hungary, Austria, north-eastern Italy and France. Now I can add Spain; I have in my collection some specimens labelled as follows: Espagne, Lerida, Graus: Valcarlos, 1400m, VI.1996, collectors not stated. To the same species are very likely to be referred specimens recorded from Alava: Roitegui, 10/15.V.1997 and Vicuña, 5.VII.1999, on *Knautia arvensis* (L.) (Ugarte & Ugarte, 2000).

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