

***Euscelis venitala* nov. sp., a new *Euscelis* taxon from the Appennine Mountains of Central Italy.**

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Key words: Zoogeography, endemism, speciation, Monti della Laga, Maiella.

Abstract: *Euscelis venitala* n. sp., a new *Euscelis* taxon from the Appennine Mountains of Central Italy. *E. venitala* n. sp. is rather similar and probably most closely related to *E. venosus* (Kbm.), but clearly differs in structures of the male ("Dorsalrand-Struktur", edeagus) and female (base of G VIII, "Intervalvenstück") genitalia. Living on meadows it is so far known from 4 localities situated between 1000 and 1400m elevation in the Central Appennine Mountains (Monti della Laga, Maiella), i.e. allopatrically distributed with *E. venosus* (Kbm.) inhabiting a large "montaneous" area from northern Spain and Great Britain into Russia (recorded as far east as Kazakhstan and Altai Mts.), but in Italy apparently confined to the Alps. As structural differences between both taxa are distinct and no "transitional" variation was found in each taxon, we take these differences as a proof for interrupted gene flow due to a low "spread ability" of both taxa (all specimens - >130 - of *E. venitala* n. sp. seen so far are brachypterous, and so are most of *E. venosus* (Kbm.)). Until contrary evidence is brought up we consider *E. venitala* n. sp. as endemic species of the Central Region of the Appennine Mountains - a region rich in endemic taxa also in other groups of animals.

As recent research has shown (Strübing e.g. 1966, 1970, 1978, 1980, 1983; Remane, 1967, 1968, 1988, 2002) the genus *Euscelis* Brullé, 1832 consists of many more species than were expected fifty years ago after Müller (1954) had discovered in several taxa a remarkably high amount of variability of the male genital structures (in addition to that in size and markings) caused by environment conditions during their larval development (resulting in synonymization of several taxa up to then thought to be distinct species (see Müller, 1958)).

From the Appennine Peninsula and its surrounding islands only few *Euscelis*-taxa (7) were known to us - only one of these might be endemic to this region (*E. corhelita* Remane, 2002 from Corsica).

In 1977 in the Laga Mountains near Campotosto one of us (R. Remane) collected a small number of specimens of an *Euscelis* taxon similar to *E. venosus* (Kbm.) in shape and markings, but differing in the shape of the edeagus (more similar to *E. seriphidii* Emeljanov) and the structures of the dorsal margin of the pygofer lobes ("Dorsalrand-Struktur").

In the meantime - collected by two of us (C. Bückle and A. Guglielmino) - a sufficient number of specimens of this taxon is available to warrant its publication.

Euscelis venitala nova species:

Description: General aspect: very similar to *E. venosus* (Kbm.) in shape, proportions, colouration and markings, but forewings of subbrachypterous males more abbreviated (thus more similar to those of the females), and dark markings less developed than in "normal" *E. venosus*.

Size and proportions: not differing from those of *E. venosus* (Kbm.). Dark markings on body and forewings normally less expanded than in *venosus*, but may be modified in both taxa by environmental conditions: specimens grown up under dry and hot conditions have less dark markings. Length of forewings in subbrachypterous males like

those of the females, i.e. more abbreviated than in subbrachypterous *E. venosus* (Kbm.) males (see figs 1A, 1B).

Male genitalia: valve, subgenital plates, styli, anal tube and major parts of the pygofer lobes as in *E. venosus* (Kbm.), differences exist 1st in the “Dorsalrand-Struktur” of the pygofer lobes (see figs 2, 3): the typical “*venosus* spine” is lacking (see figs 2A, 2B: arrow 1), and the “knoblike structure” of *venosus* is small, irregular (sometimes dent-like) (see figs 2A, 2B: arrow 2), 2nd in the shape of the edeagus (see figs 4, 5): though rather similar to that of *E. venosus* (Kbm), edeagus of *E. venitala* n. sp. is more similar to that of *E. seriphidii* Emeljanov (which does not belong to the *venosus*-group due to other characters): it differs from that of *E. venosus* (Kbm.) by a wider distal incision (V-shaped, i.e. wider at its end instead of U-shaped and narrowed at its end), by a broader, parallel-sided shaft (not narrowed distad of the phallotrema) (see figs 4A, 4B) and by the lateral parts of the shaft being more elevated against the central spermaduct in the region basad of the phallotrema (see figs 5A, 5B): seen in diameter the shaft is stronger angulated basad of the phallotrema than that of *E. venosus* (Kbm.).

Female genitalia: Sternite VII has its caudal margin in general distinctly sinuated: its central parts is curved caudally, see fig. 8A (in *E. venosus* (Kbm.) its central part is broader, but lesser far protruding caudad, its “tip” is $\pm$ truncated, see fig. 8B). - The G VIII-base has its central part clearly produced cephalad in relation to its links with the valvifers VIII, see fig. 6A (in *E. venosus* (Kbm.) it is hardly produced cephalad, see fig. 6B). - The “Intervalvenstück” is bigger, “higher” and has its ventral margin more rounded (about semicircularly), see fig. 7A (the “Intervalvenstück” of *E. venosus* (Kbm.) is smaller, less “high”, and has its ventral margin less rounded, see fig. 7B).

Type series: Holotypus Male: Central Italy: Lazio: Province of Rieti (near to border of Abruzzo): Monti della Laga, n.e. supra Campotosto, $\sim$ 1400m, 10.9.77, “Male 2”, leg. R. Remane, in coll. R. Remane, F.B. Biologie d. Philipps-Univ. Marburg. - Paratypes: same locality and date of holotypus, 1 M and numerous females, leg. et coll. Remane; Lazio: Rieti: Monti della Laga, Amatrice, 3 km north of Poggio Cancelli, $\sim$ 1300m, 7/8/2001, mowed meadow, 23 MM, 52 FF, leg. Guglielmino & Bückle, in coll. Guglielmino; Abruzzo: L'Aquila: Monti della Laga, Lago di Campotosto about 4 Km northwest of Campotosto, $\sim$ 1350m, 8/8/2001, vegetation near the lake, 6 MM, 4 FF, leg. Guglielmino & Bückle, in coll. Guglielmino; Abruzzo: Chieti: Maiella, Campo di Giove, Valico Forchetta, $\sim$ 1300m, 17/8/1998, pasture, 8 MM, 12 FF, leg. Guglielmino & Bückle, in coll. Guglielmino; Abruzzo: Chieti: Maiella, between Palena and Valico delle Forchette, $\sim$ 1000m, 19/8/1998, mixed forest, 2 MM, 4 FF, leg. Guglielmino & Bückle, in coll. Guglielmino.

Geographic distribution and “ecology”: *E. venitala* n. sp. is known up to now from four localities in the central region of the Appennine Mountains: the Monti della Laga in the North and the Maiella in the South. (The distance between the northern- and the southernmost locality is about 100 Kms.). These four sites were situated at elevations between 1000 and 1400 m. The biotopes were extensively grazed or even mown pastures and meadows inhabited by numerous plant taxa (e.g. *Artemisia* cf. *campestris*) - whether *E. venitala* n. sp. is correlated with one or more of these plant taxa or not, needs to be found out. Adults were found between August 7th and September 10th - *E. venitala* n. sp. thus seems to be - like *E. venosus* (Kbm.) - an univoltine “summer-taxon” hibernating as eggs in dormancy. Due to this phenomenology seasonal modifications of the male genitalia seem rather improbable under natural conditions.

Discussion: *E. venitala* n. sp. seems to be not only rather similar, but also closely related to *E. venosus* (Kbm.): it has in common with that taxon not only the special form and distribution of the dark markings on head, thorax and forewings, but especially the spinulation of the fore tibia: 3.4 instead of 4.4, as in all other *Euscelis* taxa known so far. As it is allopatrically distributed to *E. venosus* (Kbm.), its rank as a species of its own needs to be verified by further research: at the moment it has to be taken as a “marginal geographical offsplit” of the more widely, more or less montaneous distributed *E. venosus* (Kbm.), which is distributed from Northern Spain (Southern Pyrenees: Monte Perdido region, Remane leg.), France, Great Britain (England) through Central Europe (Nast, 1987: Belgium, Netherlands, Germany, Switzerland, northern Italy, Austria, former ČSR, Poland, Hungary, Rumania, Bulgaria, Lithuania, Latvia - but no records from Denmark and Fennoscandia!) into former USSR until Kazakhstan, Altai Mts. (Nast, 1972). In Italy *E. venosus* (Kbm.) seems to be confined to the Alps.

We assume the differences existing between *E. venitala* n. sp. and *E. venosus* (Kbm.) (= *Athysanus onustus* Ferrari, 1882, type a brachypterous female from “Austria inf. ”, Then leg. - it was examined by us) to be genetically based due to the fact, that we have not found any “transitional variability” neither in or between the *E. venitala* populations nor in or between far distant populations of *E. venosus* (Kbm.) - these differences prove interruption of gene flow between *E. venitala* n. sp. and *E. venosus* (Kbm.) probably since a rather long time. This interruption may have been favoured by a rather limited dispersal ability: all specimens (>130) of *E. venitala* n. sp. seen so far are short winged and thus incapable of flight, and also in *E. venosus* (Kbm.) macropterous males and females very seldom are found. We consider *E. venitala* n. sp. as an endemic taxon of the mountains of the Central Appennine - a region known to possess such endemisms also in other groups of Auchenorrhyncha (*Kelisia italica* Guglielmino & Remane, *Rhopalopyx cigigas* Guglielmino), in Coleoptera Carabidae and others. Further research on distribution (additional populations north or south of this area ?), communication signals, host plant range, genetics, dormancy etc. is needed to obtain more information.

Zusammenfassung

Die Appenninen-Halbinsel und die sie umgebenden Inseln waren bisher im Vergleich mit der Iberischen Halbinsel arm an Arten der Zikaden-Gattung *Euscelis* Brullé: nur 7 Arten (und nur eine davon - *E. corhelita* Remane auf Korsika -bisher als endemisch zu werten) waren bekannt, während die Iberische Halbinsel mit 17 Arten (davon 7 endemisch) über doppelt so artenreich ist. Bei Untersuchungen im Gebiet des Zentral-Appennin (Monti della Laga) im September 1977 fand einer von uns (Remane) auf wiesenartigen Biotopen mit artenreichem Pflanzenbestand einige Exemplare eines *Euscelis*-Taxons, das der in den Alpen (und Pyrenäen, dazu in West-, Mittel- und Osteuropa) verbreiteten, bis Kasachstan und dem Altai angegebenen *E. venosus* (Kbm.) sehr ähnlich in Gestalt, Proportionen, Färbung und Dunkelzeichnung und auch der Bedornung der Vordertibien war, deren Männchen sich jedoch durch kürzere Vorderflügel und besonders im Bau der Pygophor-Dorsalrandstruktur (Fehlen des mediad gerichteten “Zahns” von *venosus*) und des Aedeagus (Schaft breiter, parallelseitig, distaler Einschnitt länger, V-förmig) deutlich von *E. venosus* (Kbm.) unterschieden. Auch beim Weibchen waren Unterschiede zu *venosus* im Bau der G VIII-Basis (stärker cephalad vorragend), des Intervallvenstücks (größer, Ventralrand hoch gerundet) und auch des Caudalrandes des VII. Sternits vorhanden. Nachdem inzwischen individuenreiche Aufsammlungen aus den Monti della Laga und der Maiella

durch zwei von uns (Bückle, Guglielmino) vorlagen, wird dieses Taxon hier als *E. venitala* n. sp. beschrieben. Es ist nicht nur ähnlich, sondern auch vermutlich mit *E. venosus* (Kbm.) nächstverwandt, die konstanten Unterschiede in der Ausprägung der erwähnten Strukturen dürften genetisch bedingt sein und deuten auf (seit längerem) unterbrochenen Genfluß zwischen den beiden Taxa hin – vermutlich besteht ein Zusammenhang zur Flugunfähigkeit aller bisher gesehenen Exemplare von *E. venitala* n. sp. (>130) und der meisten von *E. venosus*: geringe Ausbreitungsfähigkeit. *E. venitala* n. sp. scheint ein endemisches Taxon der auch bei anderen Tiergruppen endemitenreichen Region des Zentral-Appennin zu sein. Weitere Untersuchungen zur Verbreitung, zu den Kommunikations-Signalen, zum Nährpflanzen-Spektrum, zur Genetik und zu Dormanzphänomenen müssen zusätzliche Informationen liefern. Die Zahl der *Euscelis*-Arten auf der Appenninen-Halbinsel erhöht sich damit auf acht.

Riassunto

L'Italia peninsulare e le isole circostanti - se paragonate con la penisola iberica - risultano povere di specie del genere *Euscelis* Brullé: per quest'area, infatti, sono note soltanto 7 specie (di cui solo una - *E. corhelita* Remane descritta dalla Corsica - considerata endemica); di contro la penisola iberica è più di due volte più ricca (17 specie, delle quali 7 endemiche). Nel corso di ricerche svolte nel 1977 sull'Appennino centrale (Monti della Laga), uno degli autori (Remane) trovava in aree aperte (rappresentate per lo più da prati con un ricco numero di specie vegetali) alcuni esemplari di un taxon di *Euscelis* molto simile, in forma, proporzioni, colorazione, disegno e chetotassia delle tibie anteriori, ad *E. venosus* (Kbm.) (specie ampiamente distribuita, dalla Spagna (Pirenei) e Gran Bretagna sino in Russia, e confinata in Italia sulle Alpi). I maschi di questo taxon però differivano distintamente da *E. venosus* (Kbm.) per le ali anteriori più corte e soprattutto nella struttura del margine dorsale del pigoforo ("Dorsalrandstruktur") (mancanza del "dente" diretto medialmente, tipico di *E. venosus*) e dell'edeago (asta dell'edeago più larga ed a lati paralleli, incisione distale più profonda ed a forma di V). Anche le femmine presentavano differenze da *E. venosus* nella struttura della base delle G VIII (più prominente in direzione cefalica), nella forma e dimensione dell'area sclerificata intervalvare ("Intervalvenstück") (più grande, con il margine ventrale ampiamente arrotondato) e del margine caudale del settimo sternite. Successive ricerche condotte sui Monti della Laga e sulla Maiella dagli altri due autori (Bückle e Guglielmino) portavano alla cattura di un elevato numero di individui, che permettevano di verificare i suddetti caratteri nell'ambito di popolazioni diverse, di osservare la mancanza di caratteri di transizione, e quindi di considerare questo taxon come una buona specie che qui viene descritta come *E. venitala* n. sp.. *E. venitala* n. sp. è un taxon non solo simile ma presumibilmente anche strettamente correlato a *E. venosus* (Kbm.); le differenze costanti a livello delle strutture menzionate sembrano essere condizionate geneticamente e si sono affermate nell'ambito di ciascun taxon in seguito ad isolamento genetico, favorito probabilmente da una ridotta capacità di diffondersi di entrambi i taxa (tutti gli esemplari di *E. venitala* n. sp. osservati - oltre 130 - sono brachitteri, così come la maggior parte degli individui di *E. venosus* (Kbm.)). *E. venitala* n. sp. sembra sia un taxon endemico dell'Appennino centrale, una regione ricca di endemiti non solo nell'ambito degli Auchenorrhyncha, ma anche in altri gruppi animali. Future ricerche sulla distribuzione (ulteriori popolazioni a nord e a sud di quest'area?), segnali di comunicazione, "range" delle piante ospiti, genetica, fenomeni di dormanza, sono necessari per ottenere ulteriori informazioni.

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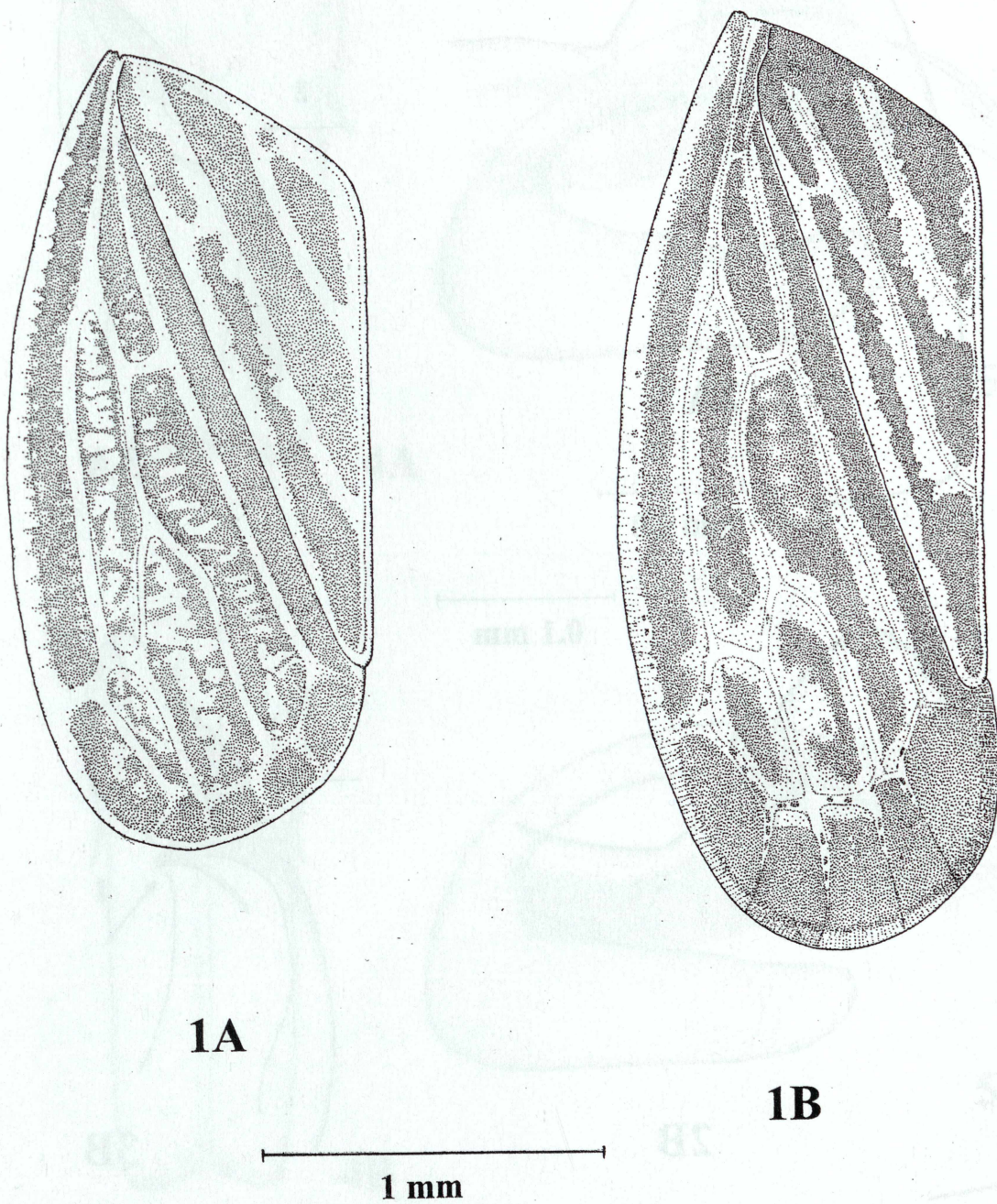


Fig. 1: Left forewing. - 1A: *Euscelis venitala* n. sp. (Paratype Male: Italy, Abruzzo, Lago di Campotosto). - 1B: *Euscelis venosus* (Kirschbaum) (Germany, Bavarian Alps, Ramsau).

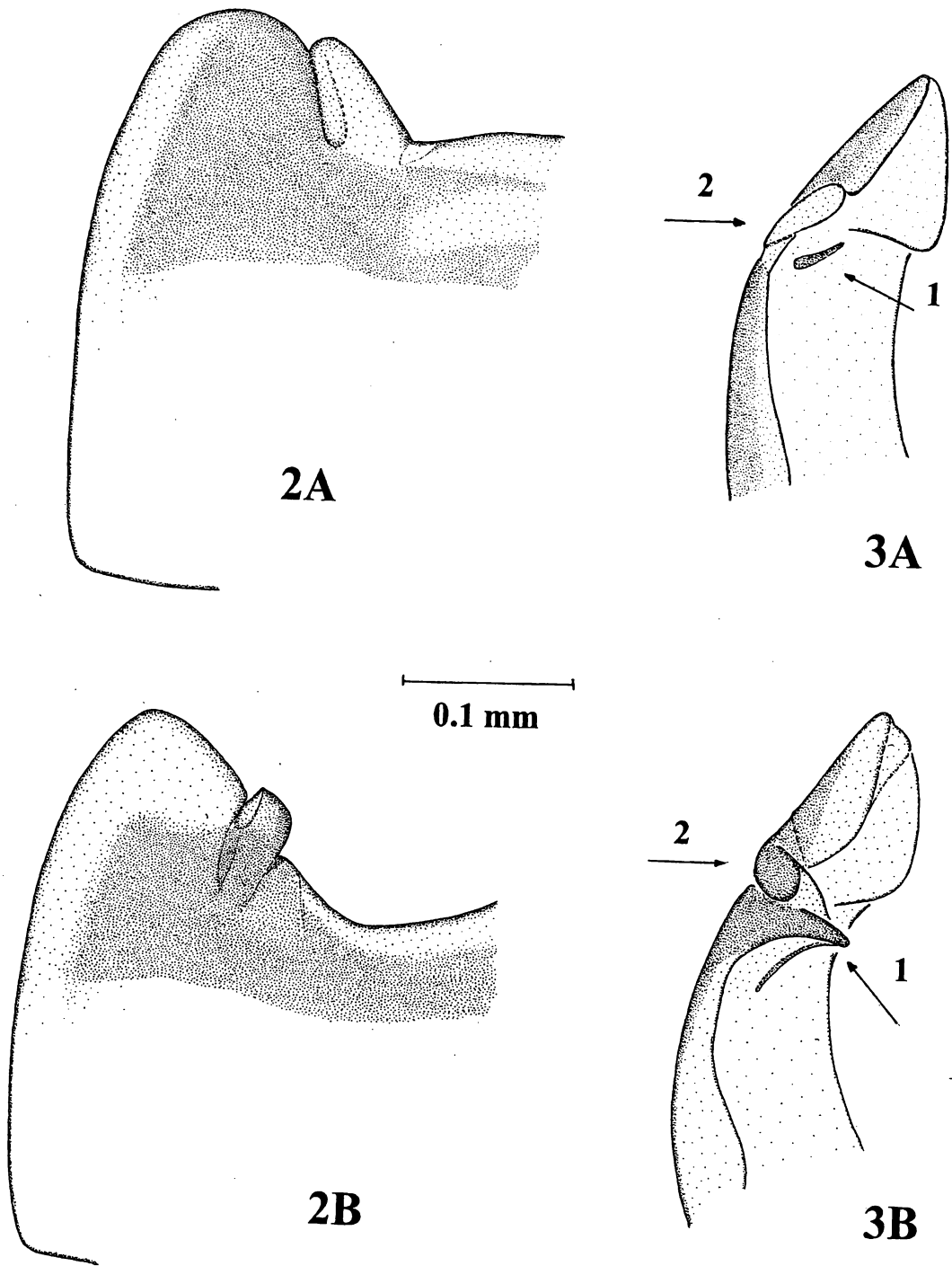


Fig. 2: Left Pygopher lobe: “Dorsalrand-Struktur”, dorsocaudal view. - 2A: *Euscelis venitala* n. sp. (same locality of fig. 1A). - 2B: *Euscelis venosus* (Kirschbaum) (same locality of fig. 1B). **Fig. 3:** Left Pygopher lobe: “Dorsalrand-Struktur”, lateral view. - 3A: *Euscelis venitala* n. sp. (same locality of fig. 1A). - 3B: *Euscelis venosus* (Kirschbaum) (same locality of fig. 1B).

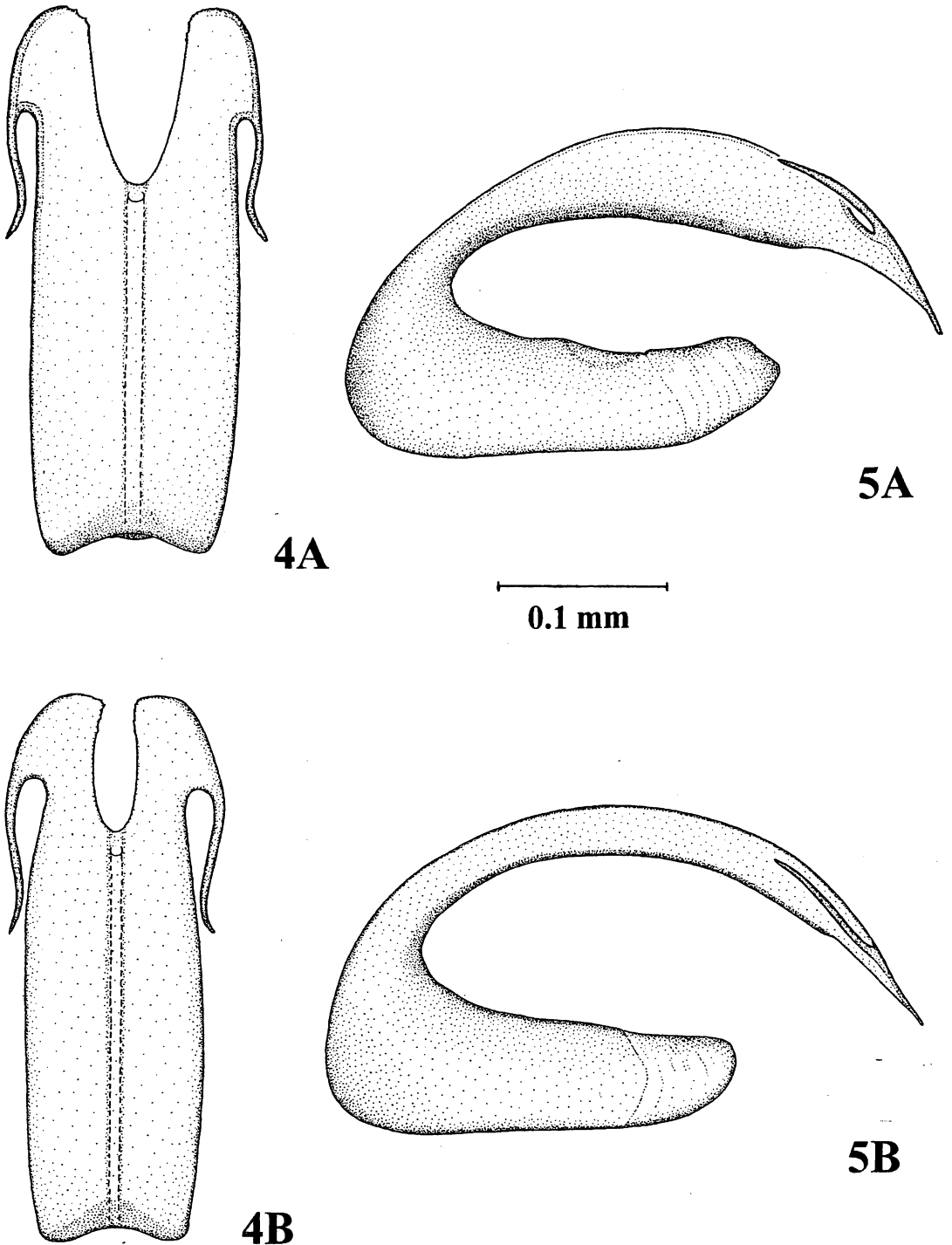
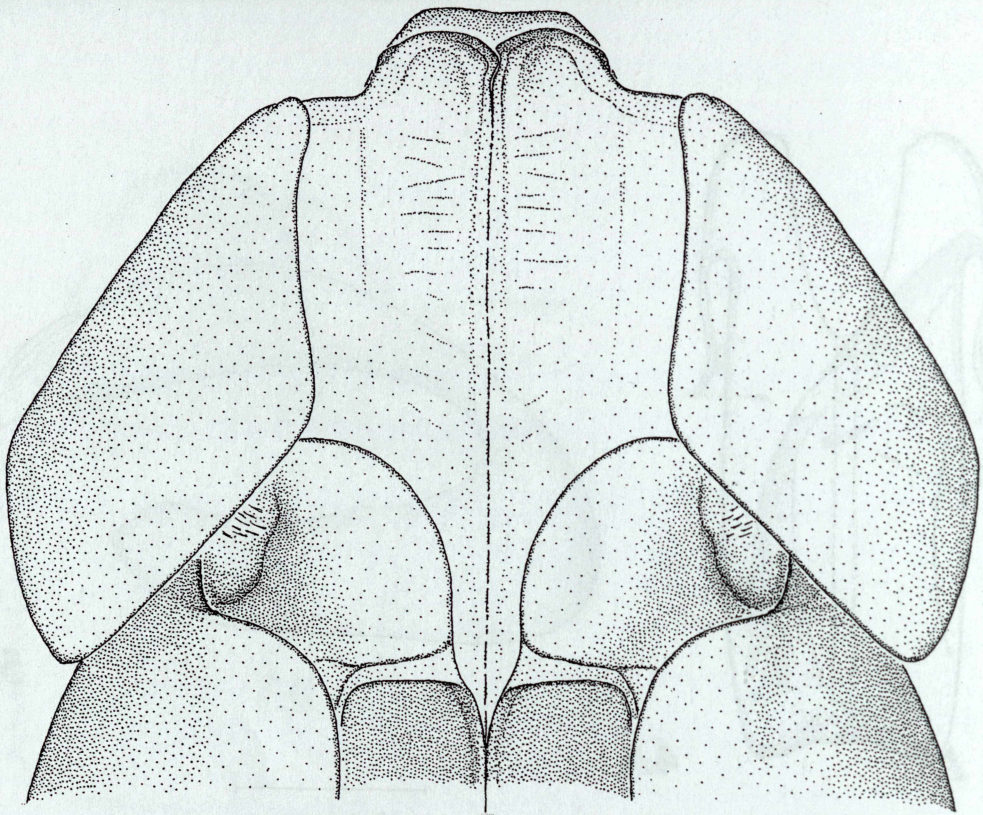


Fig. 4: Edeagus, dorsocaudal, distal part viewed perpendicular. - 4A: *Euscelis venitala* n. sp. (same locality of fig. 1A). - 4B: *Euscelis venosus* (Kirschbaum) (same locality of fig. 1B). **Fig. 5: Edeagus, lateral view.** - 5A: *Euscelis venitala* n. sp. (same locality of fig. 1A). - 5B: *Euscelis venosus* (Kirschbaum) (same locality of fig. 1B).

**6A**

0.1 mm

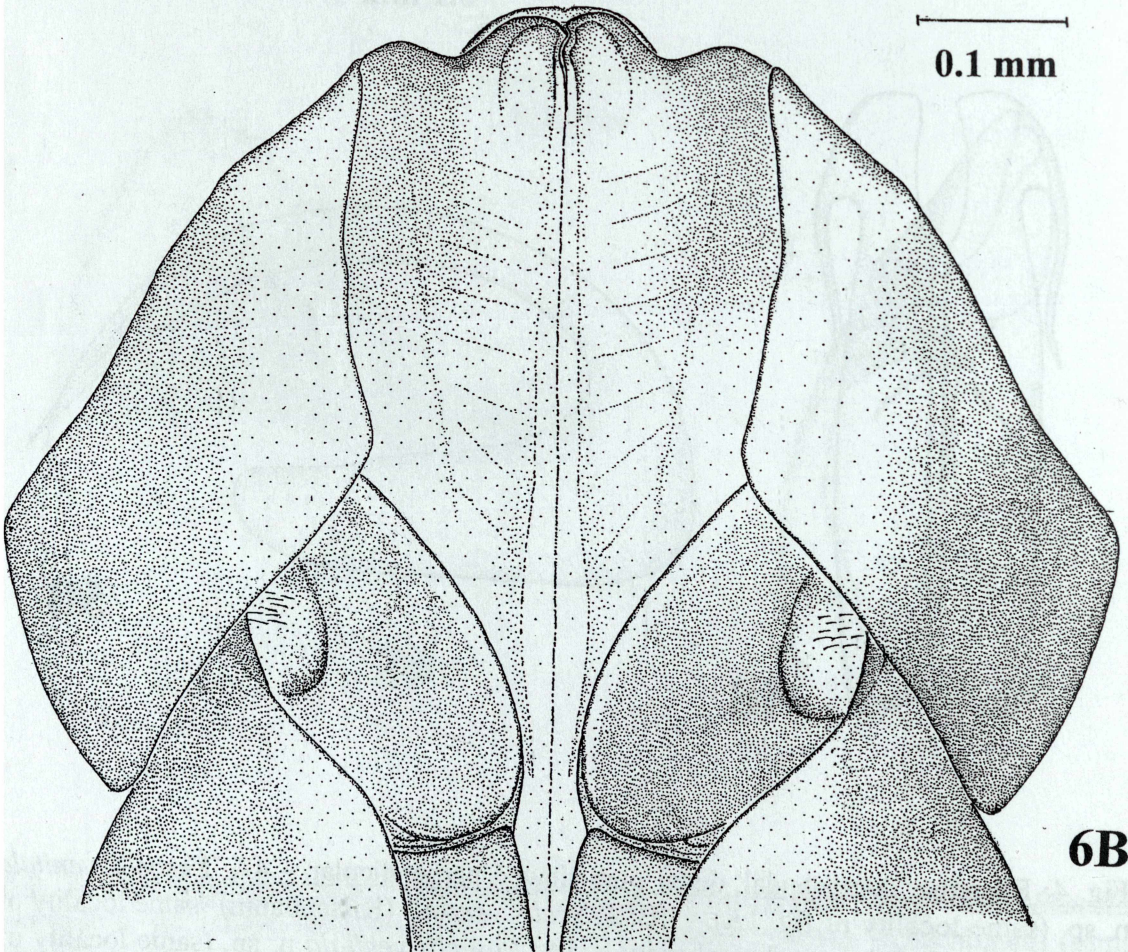
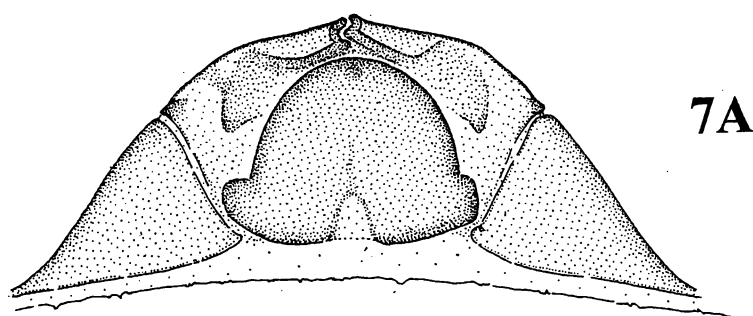
**6B**

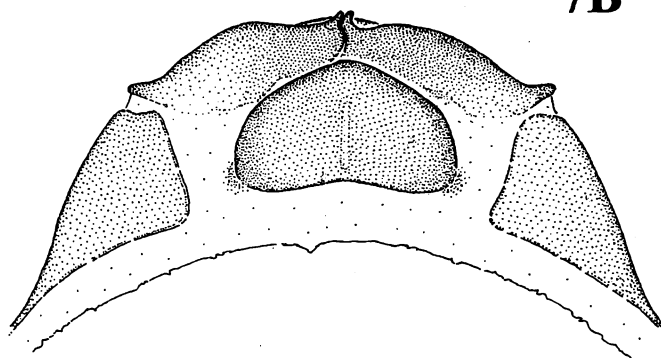
Fig. 6: Base of female genitalia, ventral view: G VIII-base. - 6A: *Euscelis venitala* n. sp. (Paratype Female: Italy, Abruzzo, Lago di Campotosto). - 6B: *Euscelis venosus* (Kirschbaum) (Female: Germany, Bavarian Alps, Ramsau).



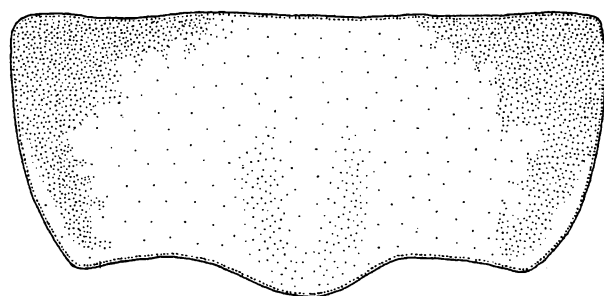
7A



0.1 mm



7B



8A

8B



0.5 mm

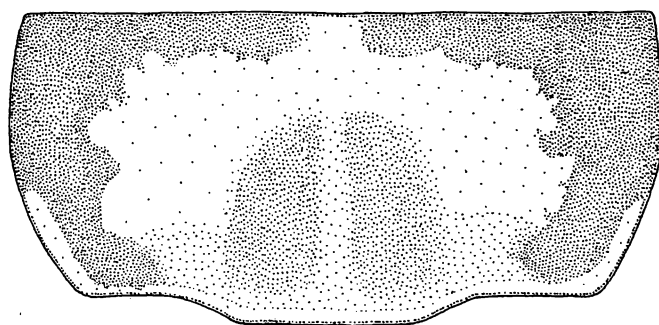


Fig. 7: Base of female genitalia, from anterior: “Intervalvenstück”. - 7A: *Euscelis venitala* n. sp. (same locality of fig. 6A). - 7B: *Euscelis venosus* (Kirschbaum) (same locality of fig. 6B). **Fig. 8:** VII. abdominal sternite, ventral view. - 8A: *Euscelis venitala* n. sp. (same locality of fig. 6A). - 8B: *Euscelis venosus* (Kirschbaum) (same locality of fig. 6B).

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