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REVIEW OF THE ANILLINA OF MACEDONIA AND DESCRIPTION OF TWO NEW SPECIES OF *PRIONIOMUS* FROM GREECE (Coleoptera, Carabidae) (*)

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INTRODUCTION

The first, and only known, Anillina described from Macedonia (Former Yugoslav Republic of Macedonia or FYROM) was *Winklerites fodori* Guéorguiev, 2007 from Šar planina, whereas the Anillina of Greece were recently reviewed by Giachino & Vailati (2011). Our friends Petr Bulirsch and Peter Hlaváč sent us in study the Anillina recently collected by themselves, or by other Czech entomologists (Lukáš Blažej, Pavel Moravec, Pavel Vonička), in Macedonia. The results of the study of this material, together with two specimens of *Prioniomus* Jeannel, 1937, belonging to two different new species, collected by the authors in Greece during the years 2010 and 2011, are offered in this contribution.

MATERIALS AND METHODS. Materials gathered by Czech colleagues Lukáš Blažej, Peter Hlaváč, Pavel Moravec and Pavel Vonička in Macedonia in 2008 and 2011 must be added to those collected by the authors in Greece during research campaigns in 2010 and 2011. The detailed examination of the specimens required, for the drawing, the making of microscopic preparations of male genitalia (and female ones when necessary) and, given the small size of the specimens, the inclusion of specimens in toto in canada balsam. The drawings were made using a camera lucida applied to a Leitz Dialux microscope. The terms used for Greek geographical names are those of Euro Atlas (1990/91). In this pa-

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per, following the approach of the catalogue by Lorenz (2005), the Anillina Jeannel, 1937, are treated altogether as a subtribe of Bembidiini Stephens, 1827.

Acronyms. The materials used for this study are deposited in the following Museums and private collections: CBl = Collection Lukáš Blažej, Děčín (Czech Republic); CBu = Collection Petr Bulirsch, Praha (Czech Republic); CGi = Collection Pier Mauro Giachino, Torino (Italy); CHl = Collection Peter Hlaváč, Kosice (Slovakia); CMo = Collection Pavel Moravec, Litoměřice (Czech Republic); CVa = Collection Dante Vailati, Brescia (Italy); CVo = Collection Pavel Vonička, Liberec (Czech Republic); NMP = National Natural History Museum, Praha (Czech Republic).

For the typical material the following acronyms are used: HT = Holotypus; PT, PTT = Paratypus (i).

For these measurements, the following acronyms are used: L = total length from the tip of mandibles to the end of elytra; UL = total length from the tip of mandibles to the end of the last urotergite; PL = length of pronotum; PW = width of pronotum; EL = length of elytra; EW = width of elytra.

TAXONOMY

Prioniomus Jeannel, 1937

Prioniomus m a l e f i c u s n. sp. (figs 1-4)

Diagnosis. A *Prioniomus* provisionally placed among the species of incertae sedis (sensu Giachino & Vailati 2011). *P. maleficus* n. sp., known on a single female, differs from the geographically nearest species, *P. scaramozzinoi* Giachino & Vailati, 2011, of O. Karáva (nom. Kardítsa), in its bigger body size, that is the biggest of all the known species of the genus.

Locus typicus. Greece, nom. Ioánina, Katara pass, 1765 m, N39°47’08.6’’ E21° 13’40.0’’.

Type series. HT ♀, Grecia, nom. Ioánina, Passo Katara, 1765 m, N39°47’08.6’’ E21°13’40.0’’, 20.VI.2008/13.VI.2010, P.M. Giachino & D. Vailati leg. (CGi).

Description of the ♀ holotype. L 3.05 mm. Body (fig. 1) elongated and narrow, depigmented, testaceous, with the abdomen lighter, yellow-

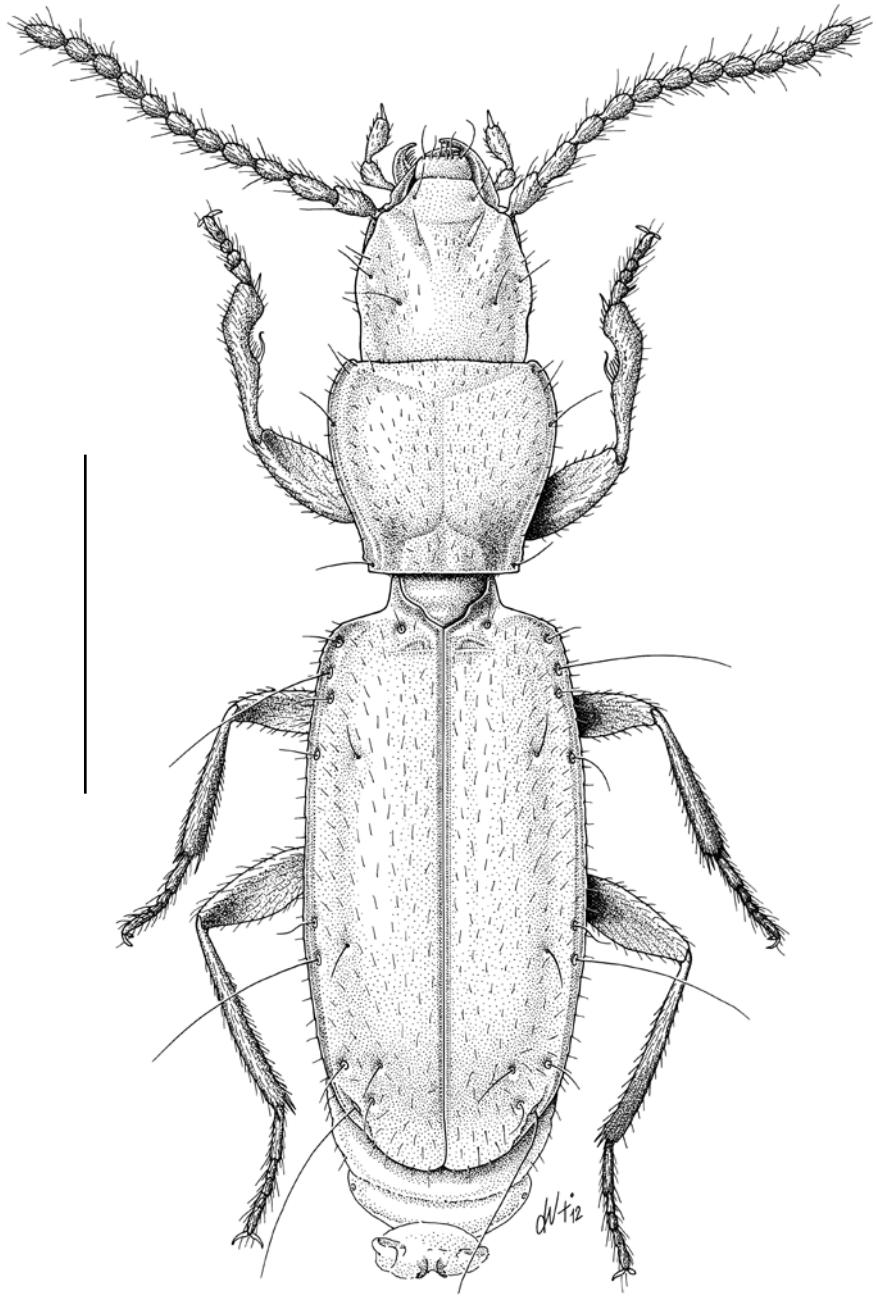
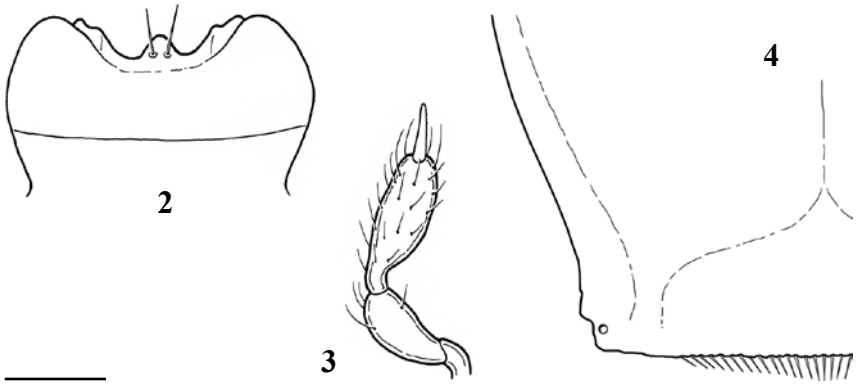


Fig. 1 – *Prioniomus maleficus* n. sp.: habitus of the HT ♀. Scale bar: 1 mm.



Figs 2-4 – *Prioniomus maleficus* n. sp.: HT ♀, profile of the labium (2); maxillary palp (3); basal angle of the pronotum (4). Scale bar: 0.1 mm.

testaceous; shiny integuments, with an evident microsculpture having an isodiametric mesh, covered with a sparse, long and erect pubescence.

Head robust, but not hypertrophic, narrower than pronotum, anophthalmous. Antennae long, frail, moniliform but with slightly elongated antennomeres, exceeding neatly the base of the pronotum when stretched backwards. Fronto-clypeal furrow distinct; anterior margin of the epistome subrectilinear. Two supraorbital setae on each side, close together, on lines very convergent backwards. Mandibles elongated, simple, without dorsal ridges, left premolar tooth absent, right premolar tooth small and placed before the level of the anterior margin of the labrum, which is provided with 6 anterior marginal setae.

Pronotum only slightly transverse (PW/PL = 1.07), with the maximum width at the base of the anterior third, significantly narrower at the base, with curved sides, distinctly sinuate and slightly crenellate before the basal angles. Base not emarginate laterally before the basal angles (fig. 4). Anterior angles rounded, slightly prominent; posterior ones right and marked. Disk feebly convex, with a long and sparse pubescence; median groove very shallow. Marginal groove wide and flattened, enlarged near the base; anterior marginal setae inserted inside the marginal groove, at the level of the base of the anterior third, along with two more supernumerary setae on each side, slightly shorter; basal setae inserted almost on the basal angles.

Legs with 4th and 5th mesotarsomeres with an onset of fusion; pro- and metatarsomeres normally shaped.

Elytra oval, very elongated (EL/EW = 1.94), with the maximum width at the centre, not emarginate, broadly rounded externally in the preapical area. Disk convex, shiny integuments, with an evident microsculpture having an isodiametric mesh, and long, sparse and erect pubescence. Humeri marked, but rounded, post-humeral margin significantly denticulate, with an evident crenellation up to the height of the 7th pore of the umbilicate series; elytral apices separately rounded. Marginal groove narrow and evident up to the height of the 9th pore of the umbilicate series.

Chaetotaxy: basal umbilicate pore of medium size, foveate. Umbilicate series of type A; 1st, 2nd and 3rd pores almost equidistant, with the 2nd and 3rd slightly closer; 4th pore far from the 3rd as the distance between the 1st and the 3rd; 1st, 2nd and 4th placed on the edge of the elytral groove, the 3rd one slightly shifted towards the disk; the 5th and 6th pores are paired and situated before the apical third; the 7th, 9th and 8th are not equidistant from each other, with the 8th and 9th forming a "geminate" pair; the 8th being aligned with the posterior discal seta and shifted further slightly before the 9th; the 7th significantly shifted onto the disk. Discal pores three in number and not well aligned with each other: the 1st and 3rd ones are placed at the level of the 4th and 7th umbilicate pores, respectively, while the 2nd is located approximately at the level of the 6th umbilicate pore; 3rd pore much more shifted towards the elytral suture than to the 1st and 2nd.

Male unknown.

Etymology. From the Greek word meaning "Katara," a mountain pass above the village of Metsovo, which means "cursed".

Distribution and ecology. *P. maleficus* n. sp. is currently known only from the type locality of Katara pass, situated above the village of Metsovo (nom. Ioánina) at 1765 m a.s.l. In this site *P. maleficus* n. sp., an abnormal fact for an anilline, was found in a trap, baited with cheese, placed in the superficial subterranean environment in a forest road slope, on limestone.

Prioniomus c a o d u r o i n. sp. (figs 5-8)

Diagnosis. A *Prioniomus* provisionally placed among the species of incertae sedis (sensu Giachino & Vailati 2011). *P. caoduroi* n. sp., known on a single female, differs from the geographically neares spe-

cies, *P. antonellae* Giachino & Vailati, 2011, of O. Erímanthos (nom. Ahaïa), in its bigger body size, that is the biggest of all the known species from the Peloponnese.

Locus typicus. Greece, nom. Ahaïa, rd. Kasteli-Kalavrita, 1040 m, N37°53'02.5'' E22°02'49.4''.

Type series. HT ♀, Grecia, nom. Ahaïa, str. Kasteli-Kalavrita, 1040 m, N37°53'02.5'' E22°02'49.4'', 3.VI.2010/21.V.2011, P.M. Giachino & D. Vailati leg. (CGi).

Description of the ♀ holotype. L 2.61 mm. Body (fig. 5) elongated and narrow, depigmented, testaceous, with legs and antennae lighter, yellow-testaceous; shiny integuments, with an evident microsculpture having an isodiametric mesh, covered with a sparse, long and erect pubescence.

Head robust, but not hypertrophic, narrower than pronotum, anophthalmous. Antennae long, frail, moniliform but with slightly elongated antennomeres, exceeding neatly the base of the pronotum when stretched backwards. Fronto-clypeal furrow distinct; anterior margin of the epistome subrectilinear. Two supraorbital setae on each side, close together, on lines very convergent backwards. Mandibles elongated, simple, without dorsal ridges, left premolar tooth absent, right premolar tooth small and placed before the level of the anterior margin of the labrum, which is provided with 6 anterior marginal setae.

Pronotum slightly transverse (PW/PL = 1.11), with the maximum width at the base of the anterior third, significantly narrower at the base, with curved sides, distinctly sinuate and crenellate before the basal angles. Base slightly emarginate laterally before the basal angles (fig. 8). Anterior angles rounded, slightly prominent; posterior ones marked and prominent. Disk feebly convex, with a long and sparse pubescence; median groove very shallow. Marginal groove wide and flattened, enlarged near the base; anterior marginal setae inserted inside the marginal groove, at the level of the anterior third, along with one-two more supernumerary setae on each side, slightly shorter; basal setae inserted almost on the posterior angles.

Legs with tarsomeres normally shaped, without any onset of fusion on the 4th and 5th mesotarsomeres.

Elytra oval, very elongated (EL/EW = 1.83), with the maximum width at the centre, not emarginate, broadly rounded externally in the preapical area. Disk convex, shiny integuments, with an evident micros-

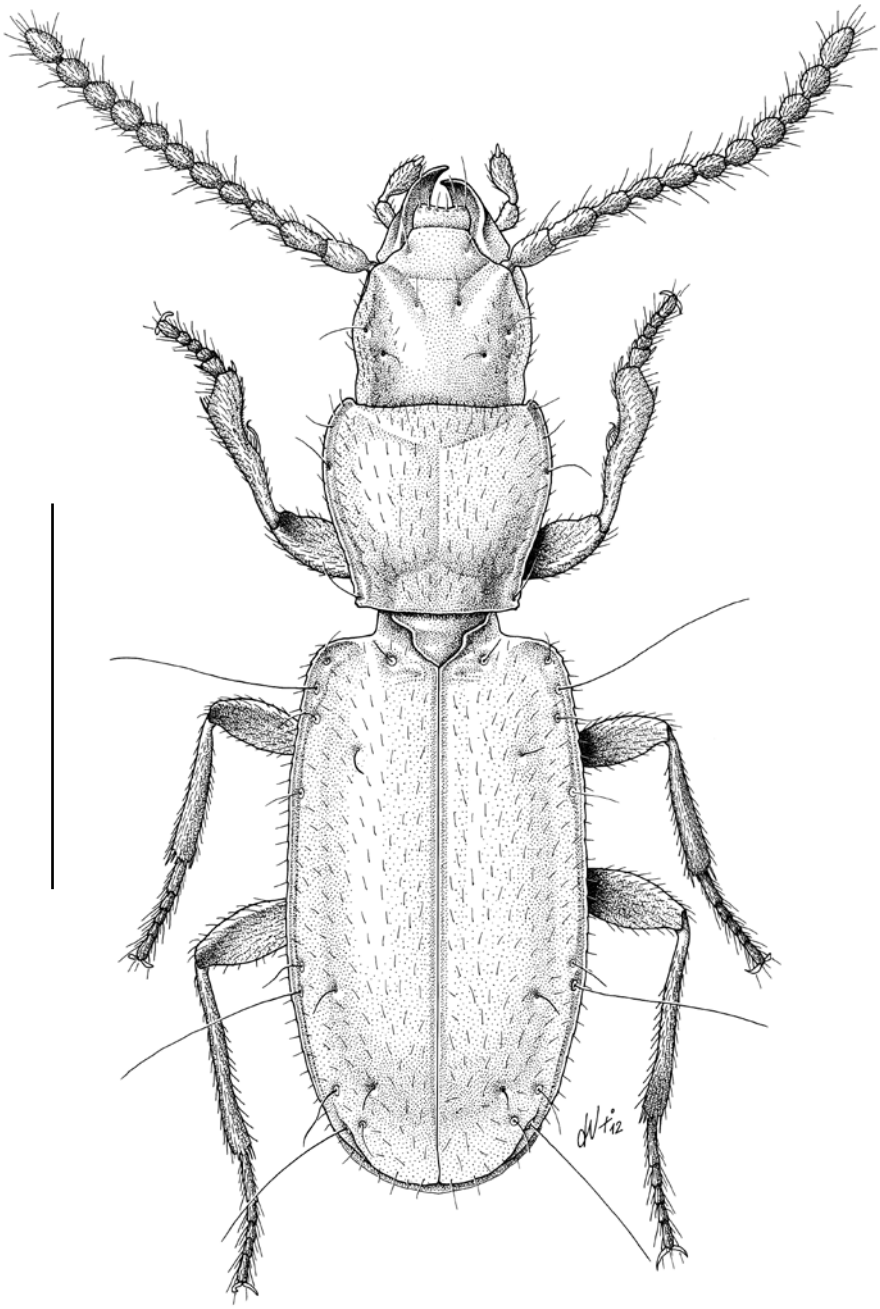


Fig. 5 – *Prioniomus caoduroi* n. sp.: habitus of the HT ♀. Scale bar: 1 mm.

Figs 6-8 – *Prioniomus caoduroi* n. sp.: HT ♀, profile of the labium (6); maxillary palp (7); basal angle of the pronotum (8). Scale bar: 0.1 mm.

culpture having an isodiametric mesh, and long, sparse and erect pubescence. Humeri well marked, slightly rounded, post-humeral margin significantly denticulate, with an evident crenellation up to the height of the 7th pore of the umbilicate series; elytral apices not separately rounded. Marginal groove narrow and evident up to the height of the 9th pore of the umbilicate series.

Chaetotaxy: basal umbilicate pore of medium size, foveate. Umbilicate series of type A; 1st, 2nd and 3rd pores almost equidistant; 4th pore far from the 3rd a little more than the distance between the 1st and the 3rd; 1st, 2nd and 4th placed on the edge of the elytral groove, the 3rd one slightly shifted towards the disk; the 5th and 6th pores are paired and situated before the apical third; the 7th, 9th and 8th are not equidistant from each other, with the 8th and 9th forming a "geminate" pair; the 8th being aligned with the posterior discal seta and shifted further slightly before the 9th; the 7th significantly shifted onto the disk. Discal pores three in number and not well aligned with each other: the 1st and 3rd ones are placed well before the 4th umbilicate pore and approximately at the level of the 7th, respectively, while the 2nd is located approximately at the level of the 6th umbilicate pore; 3rd pore much more shifted towards the elytral suture than to the 1st and 2nd.

Male unknown.

Etymology. The new species is dedicated to our friend Gianfranco Caoduro, biospeleologist and Chairman of the Word Biodiversity Asso-

ciation onlus, as a token of acknowledgement for the support of our studies on the Greek fauna.

Distribution and ecology. *P. caoduroi* n. sp. is currently known only from the type locality situated along the road from Kasteli to Kalavrita (nom. Ahaïa) at 1040 m a.s.l. In this site, *P. caoduroi* n. sp., an abnormal fact for an anilline, was found in a trap, baited with cheese, placed in the superficial subterranean environment in the road slope, on limestone.

Winklerites Jeannel, 1937

«Group of *W. weiratheri*» (sensu Casale et al. 1990 and Giachino & Vailati 2011)

Winklerites v o n i c k a i n. sp. (figs 9-14)

Diagnosis. A *Winklerites* of 2.01-2.09 mm, belonging to the group of *W. weiratheri* (Müller, 1934) (sensu Giachino & Vailati 2011) for the shape of the median lobe of the aedeagus.

Winklerites vonickai n. sp. differs from *W. blazeji* n. sp. of Galičica Mts. in the less stubby elytra with the sides more parallel, the less advanced position of the first discal pore, the median lobe of the aedeagus with a ventral margin slightly bisinuate before the apex, that is very strongly enlarged and for a ω-shaped copulative lamella. It differs from *W. moraveci* n. sp. of Baba pl. in the less stubby elytra with the sides more parallel, the less advanced position of the first discal pore, the median lobe of the aedeagus with a ventral margin not curved but slightly bisinuate before the apex, that is very strongly enlarged but not largely beak-shaped and for a ω-shaped copulative lamella.

Locus typicus. Macedonia, Bistra pl. Mts., Lazaropole, 1300-1400 m.

Type series. HT ♂: Macedonia, Bistra pl. Mts., Lazaropole, 1300-1400 m, 15.VI.2008, P. Vonička leg. (CGi).

PTT: 8 ♂♂ 7 ♀♀, Macedonia, Bistra pl. Mts., Lazaropole, 1300-1400 m, 15.VI.2008, P. Moravec leg. (CBu, CMo, CGi, CVa); 13 ♂♂ 8 ♀♀, Macedonia, Bistra pl. Mts., Lazaropole, 1300-1400 m, 15.VI.2008, P. Vonička leg. (CBu, CGi, CVa, CVo); 17 ♂♂ 9 ♀♀, Macedonia, Bistra pl. Mts., Lazaropole, 1300-1400 m, 15.VI.2008, L. Blažej leg. (CBl, CBu, CGi, CVa); 1 ♂ 1 ♀, Macedonia, Bistra pl. Mts., Mavrovo, Carevec pass env., 1500-1650 m, 16.VI.2008, P. Moravec leg. (CMo); 1 ♂ 3 ♀♀, Macedonia, Bistra pl. Mts., Ma-

vrovo, Carevec pass env., 1500-1650 m, 16.VI.2008, P. Vonička leg. (CGi, CVo); 1 ♂ 2 ♀♀, Macedonia, Bistra pl. Mts., Mavrovo, Carevec pass env., 1500-1650 m, 16.VI.2008, L. Blažej leg. (CBl, CGi); 8 ♂♂ 11 ♀♀, Macedonia, Bistra Mts., Mavrovo env. valley, near stream under large stone, 16.VI.2011, P. Hlaváč leg. (CBu, CGi, CHl, NMP).

Description. L 2.01-2.09 mm (UL 2.23-2.49 mm). Body (fig. 9) long and narrow, depigmented, uniformly yellow-testaceous; shiny integuments, with a very evident microsculpture of an isodiametric mesh, covered with a sparse and short pubescence.

Head robust, but not hypertrophic, narrower than pronotum, anophthalmous. Antennae robust, neatly moniliform starting from the fourth antennomere, neatly exceeding the base of the pronotum when stretched backwards. Fronto-clypeal furrow slightly distinct; anterior margin of the epistome subrectilinear. Two supraorbital setae on each side, not so close to each other, on lines neatly converging backwards. Mandibles short, simple, without dorsal ridges, premolar tooth developed and situated, on the right mandible, in a basal position, before the anterior margin of the labrum. Labrum provided with 6 anterior marginal setae.

Pronotum very slightly transverse (PW/PL = 1.12 ♂, 1.17 ♀), with the maximum width at the base of the anterior third, narrowed at the base, with sides longly and regularly arcuate, abruptly and briefly sinuate before the base, not denticulate neither emarginate before the basal angles (fig. 12). Anterior angles rounded, poorly prominent; the posterior ones subrectangular, not denticulate at the tip. Disk faintly convex, with a short and sparse pubescence; median groove deep and evident. Marginal groove wide and flattened, not restricted near the base, anterior marginal setae inserted inside the marginal groove, roughly at the base of the anterior fourth; basal setae well before the posterior angles.

Elytra ovoidal, elongated and parallel (EL/EW = 1.64 ♂, 1.60 ♀), with the maximum width at the middle, emarginate in the preapical area. Disk poorly convex, subflat; shiny integuments, with a very evident microsculpture of an isodiametric mesh. Humeri poorly marked, rounded; post-humeral margin denticulate, with a very fine but distinct crenellation up to the height of the 1st discal pore; elytral apices separately and broadly rounded. Marginal groove wide and evident up to the height of the apical emargination.

Chaetotaxy: basal umbilicate pore big, foveate. Umbilicate series of type B; 3rd pore of the umbilicate series slightly closer to the 2nd than the latter to the 1st, 4th pore decidedly farther and placed beyond the basal third of the elytron and beyond the anterior discal seta; 5th pore placed

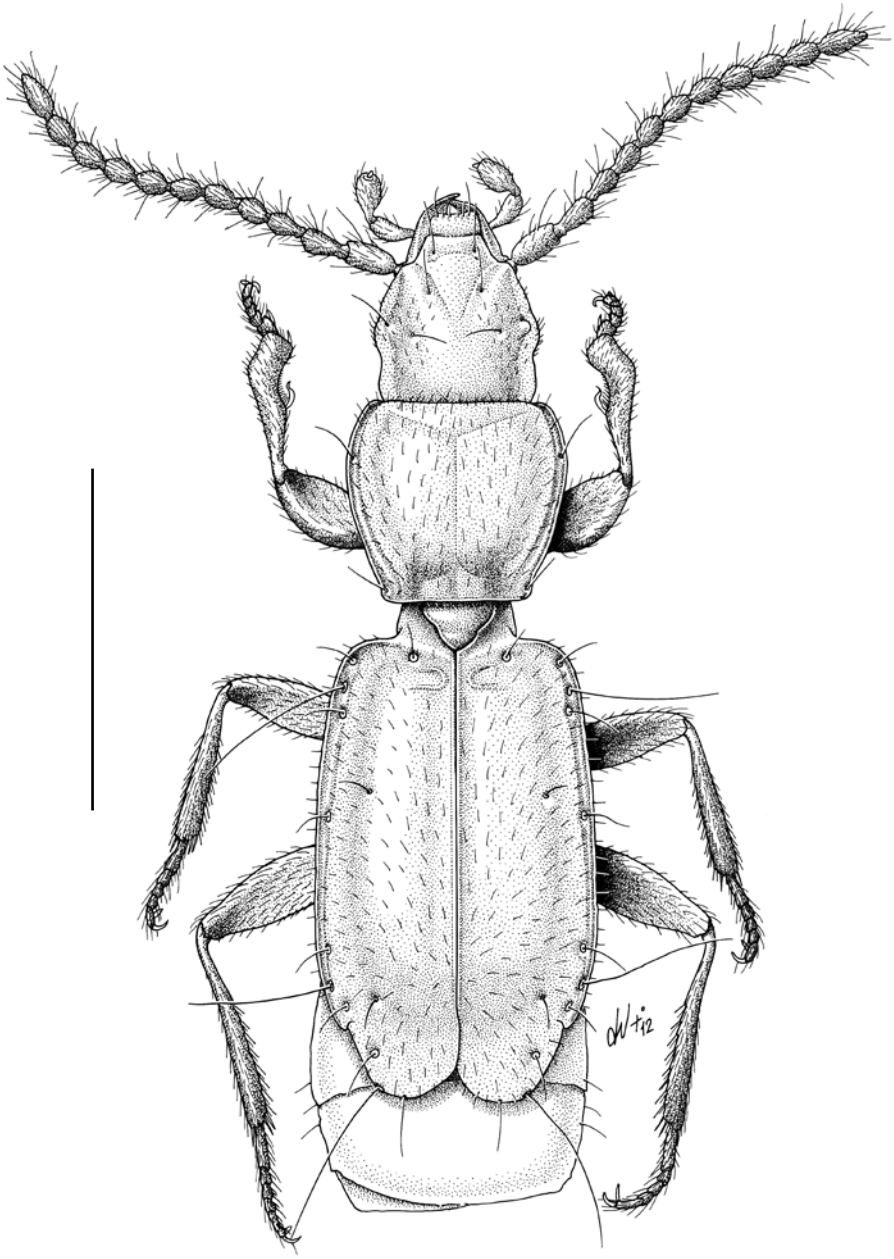
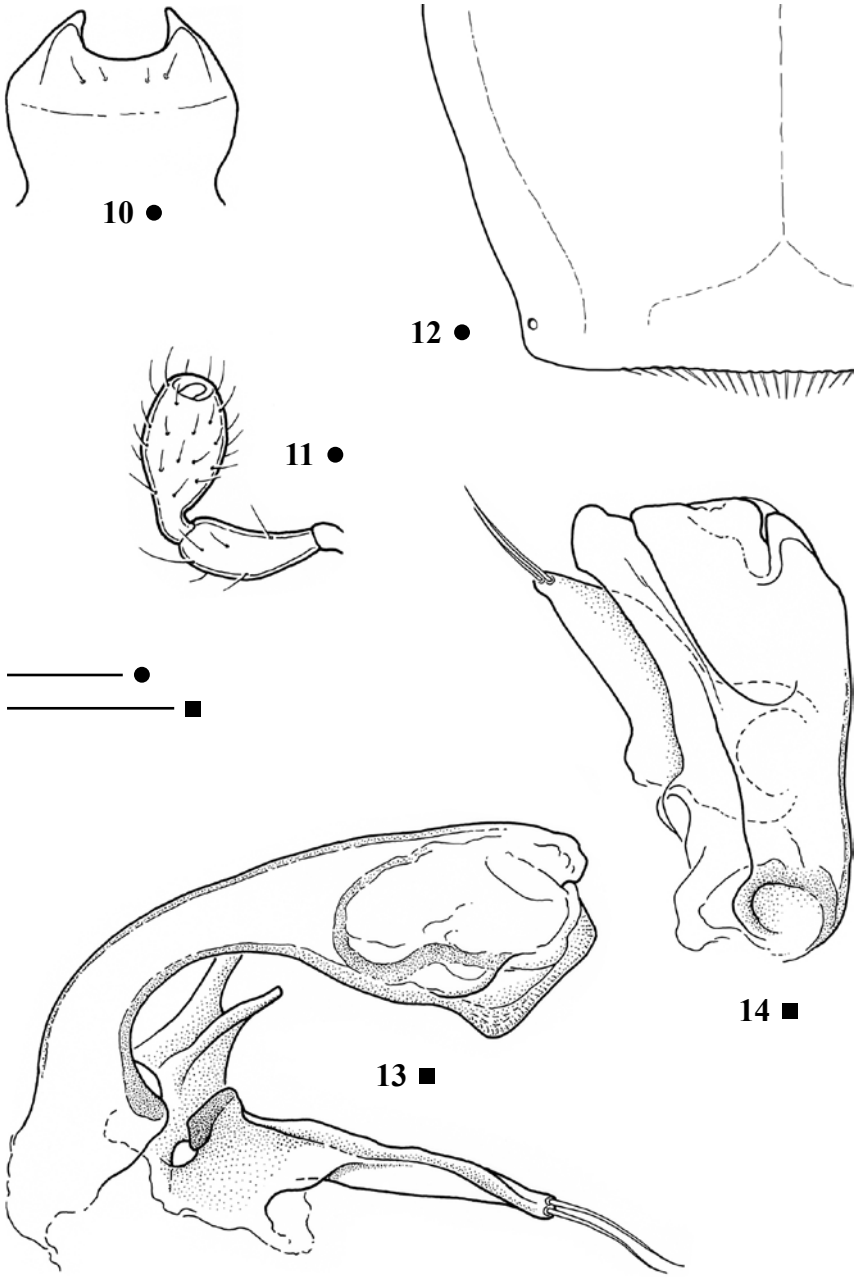


Fig. 9 – *Winklerites vonickai* n. sp.: habitus of the HT ♂. Scale bar: 1 mm.



Figs 10-14 – *Winklerites vonickai* n. sp.: HT ♂, profile of the labium (10); maxillary palp (11); basal angle of the pronotum (12); aedeagus in lateral view (13); aedeagus in dorsal view (14). Scale bars: 0.1 mm.

slightly before the apical third of the elytron; 5th, 6th and 7th pores almost equidistant from each other, with the 6th and 7th slightly closer; the 8th one shifted onto the disk and aligned with the posterior discal seta; the 7th, 8th and 9th not equidistant from each other (with a distance between the 7th and the 8th double than the distance between the 8th and the 9th). Two discal pores: the 1st one placed at the base of the anterior third of the elytron and well before the 4th pore of the umbilicate series, while the 2nd one is located approximately at the level of the 7th.

Aedeagus (figs 13-14) relatively big, longly arcuate; median lobe twisted on the right side and ventral margin, in lateral view, slightly bisinuate before the apex, that is very and strongly enlarged, with the apical blade obliquely truncated, not prolonged backwards ventrally into a chitinized edge. Inner sac provided with a well chitinized ω-shaped copulative lamella. Parameres unequal, elongated, provided with two apical setae each.

Etymology. We are pleased to dedicate this new and interesting species to our Czech colleague Pavel Vonička who collected the first specimen.

Distribution and ecology. *W. vonickai* n. sp. is currently known from two localities situated in the Bistra planina (Macedonia): Lazaropole and Carevec pass near Mavrovo at an altitude from 1300 m to 1650 m a.s.l. In these sites *W. vonickai* n. sp. was found under deeply embedded rocks in a *Fagus* forest.

Winklerites b l a z e j i n. sp. (figs 15-19)

Diagnosis. A *Winklerites* of 2.20-2.29 mm, belonging to the group of *W. weiratheri* (Muller, 1934) (sensu Giachino & Vailati 2011) for the shape of the median lobe of the aedeagus.

Winklerites blazeji n. sp. differs from *W. vonickai* n. sp. of Bistra pl. in the more stubby elytra with the sides less parallel, the more advanced position of the first discal pore, the median lobe of the aedeagus with a ventral margin not bisinuate before to the apex, that is less enlarged, and a concave copulative lamella. It differs from *W. moraveci* n. sp. of Baba pl. in the more stubby elytra with the sides less parallel, the more advanced position of the first discal pore, the median lobe of the aedeagus

with a ventral margin less curved before to the apex, that is very strongly enlarged but not largely beak-shaped, and a concave copulative lamella.

Locus typicus. Macedonia, Galičica Mts., Livada pass, 1650-1800 m.

Type series. HT ♂: Macedonia, Galičica Mts., Livada pass, 1650-1800 m, 9-10. VI.2008, L. Blažej leg. (reg. silv.) (CGi).

PTT: 8 ♂♂ 5 ♀♀, Macedonia, Galičica Mts., Livada pass, 1650-1800 m, 9-10. VI.2008, L. Blažej leg. (reg. silv.) (CBl, CBu, CGi, CVa); 3 ♂♂ 4 ♀♀, Macedonia, Galičica Mts., Livada pass, Δ Magaro, 1650-1800 m, 9-10.VI.2008, P. Moravec leg. (reg. silv.) (CBu, CGi, CMo); 5 ♂♂, Macedonia, Galičica Mts., Livada pass, Δ Magaro, 1650-1800 m, 9-10.VI.2008, P. Vonička leg. (reg. silv.) (CGi, CVo).

Description. L 2.20-2.29 mm (UL 2.34-2.53 mm). Body (fig. 15) moderately long and narrow, depigmented, uniformly red-testaceous; shiny integuments, with a very evident microsculpture of an isodiametric mesh, covered with a sparse and short pubescence.

Head robust, slightly hypertrophic, narrower than pronotum, anophthalmous. Antennae robust, neatly moniliform starting from the fourth antennomere, neatly exceeding the base of the pronotum when stretched backwards. Fronto-clypeal furrow slightly distinct; anterior margin of the epistome subrectilinear. Two supraorbital setae on each side, not so close to each other, on lines neatly converging backwards. Mandibles short, simple, without dorsal ridges, premolar tooth developed and situated, on the right mandible, in a basal position, before the anterior margin of the labrum. Labrum provided with 6 anterior marginal setae.

Pronotum practically not transverse (PW/PL = 1.09 ♂, 1.10 ♀), with the maximum width at the base of the anterior fourth, narrowed at the base, with sides longly and regularly arcuate, briefly sinuate before the base, not denticulate neither emarginate before the basal angles (fig. 18). Anterior angles rounded, poorly prominent; the posterior ones subrectangular, not denticulate at the tip. Disk faintly convex, with a short and sparse pubescence; median groove deep and evident. Marginal groove wide and flattened, not restricted near the base, anterior marginal setae inserted inside the marginal groove, roughly at the base of the anterior third; basal setae well before the posterior angles.

Elytra ovoidal, short and not parallel (EL/EW = 1.49 ♂, 1.48 ♀), with the maximum width at the middle, emarginate in the preapical area. Disk poorly convex, subflat; shiny integuments, with a very evident microsculpture of an isodiametric mesh. Humeri poorly marked, rounded; post-humeral margin denticulate, with a very fine but distinct crenella-

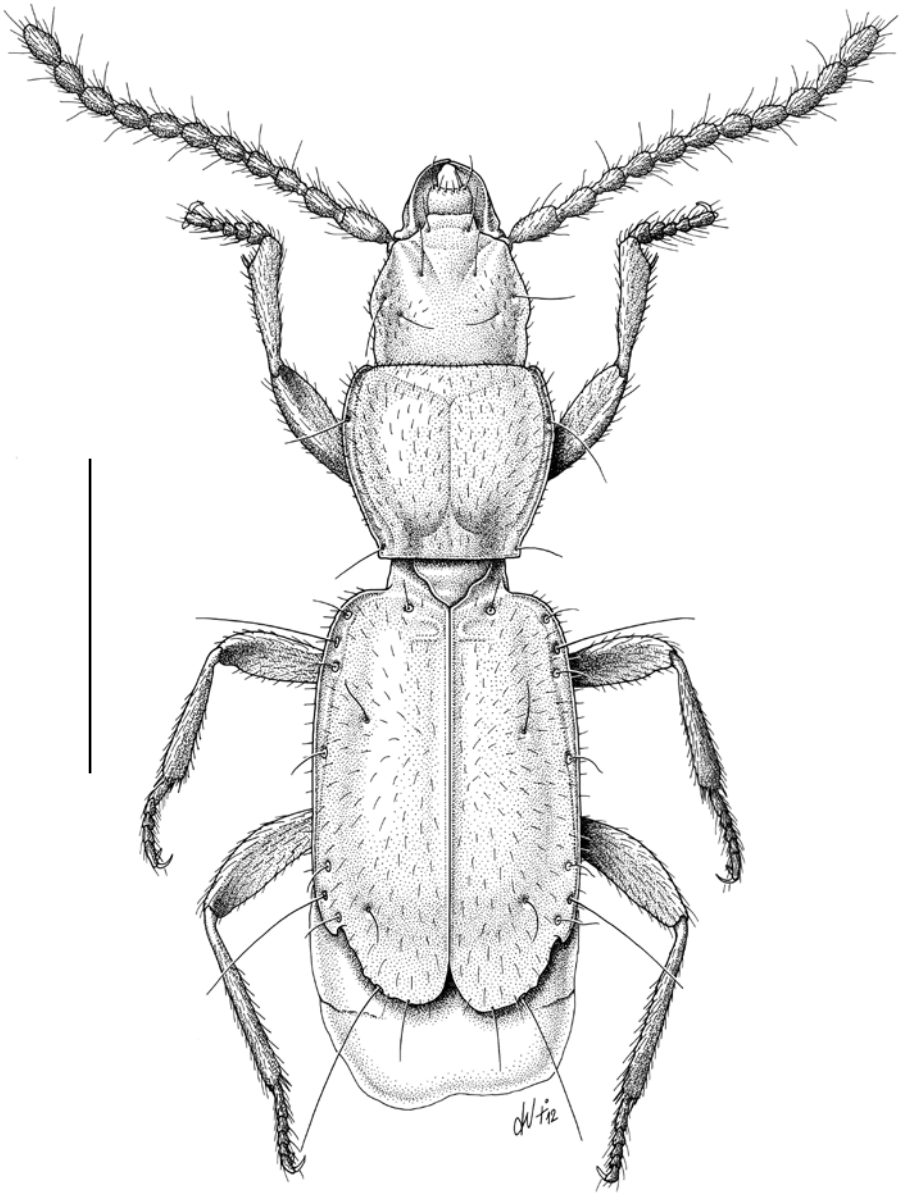
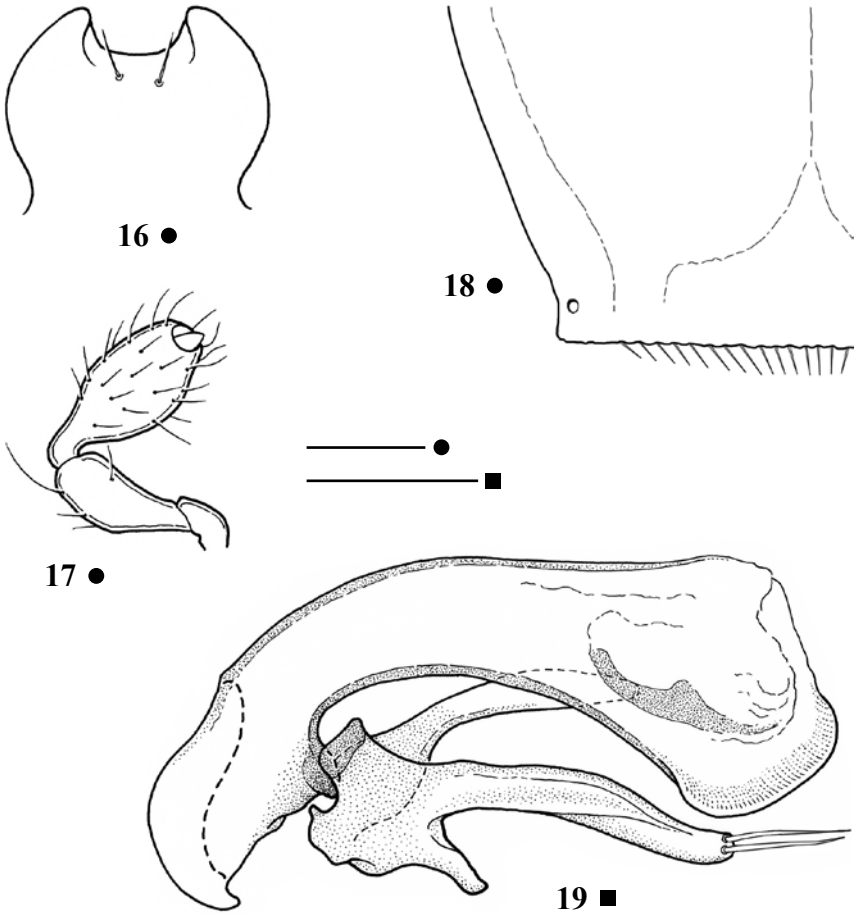


Fig. 15 – *Winklerites blazeji* n. sp.: habitus of the HT ♂. Scale bar: 1 mm.

tion up to the height of the 1st discal pore; elytral apices separately and broadly rounded. Marginal groove wide and evident up to the height of the apical emargination.

Chaetotaxy: basal umbilicate pore big, foveate. Umbilicate series of type B; 3rd pore of the umbilicate series slightly closer to the 2nd than the latter to the 1st; 4th pore decidedly farther and placed beyond the basal third of the elytron and beyond the anterior discal seta; 5th pore placed slightly before the apical third of the elytron; 5th, 6th and 7th pores almost equidistant from each other, with the 5th and 6th slightly closer; the 8th one



Figs 16-19 – *Winklerites blazeji* n. sp.: HT ♂, profile of the labium (16); maxillary palp (17); basal angle of the pronotum (18); aedeagus in lateral view (19). Scale bars: 0.1 mm.

shifted onto the disk and aligned with the posterior discal seta; the 7th, 8th and 9th not equidistant from each other (with a distance between the 7th and the 8th less than the double of the distance between the 8th and the 9th). Two discal pores: the 1st one placed well before the base of the anterior third of the elytron and well before the 4th pore of the umbilicate series, while the 2nd one is located before the level of the 7th.

Aedeagus (fig. 19) relatively big, shortly arcuate; median lobe twisted on the right side, and ventral margin, in lateral view, gently curved from the basal bulb to the apex, that is very enlarged, with the apical blade obliquely rounded, beak-shaped, not prolonged backwards ventrally into a chitinized edge. Inner sac provided with a large, well chitinized, concave, copulative lamella. Parameres unequal, elongated, provided with two apical setae each.

Etymology. We are pleased to dedicate this new and interesting species to our Czech colleague Lukáš Blažej, who collected the first specimen.

Distribution and ecology. *W. blazeji* n. sp. is currently known only from the type locality of Livada pass (Magaro Mt.) situated in the Galičica planina (Macedonia) at 1650-1800 m a.s.l. In this site *W. blazeji* n. sp. was found under deeply embedded rocks in a *Fagus* forest.

Winklerites m o r a v e c i n. sp. (figs 20-24)

Diagnosis. A *Winklerites* of 2.52 mm, belonging to the group of *W. weiratheri* (Muller, 1934) (sensu Giachino & Vailati 2011) for the shape of the median lobe of the aedeagus.

Winklerites moraveci n. sp. differs from *W. vonickai* n. sp. of Bistra pl. in the more stubby elytra with the sides more parallel, the median lobe of the aedeagus with a ventral margin curved, not bisinuate before to the apex, that is less enlarged but largely beak-shaped, and a C-shaped copulative lamella. It differs from *W. blazeji* n. sp. of Galičica Mts. in the less stubby elytra with the sides more parallel, the less advanced position of the first discal pore, the median lobe of the aedeagus with a ventral margin more curved before to the apex, that is strongly enlarged and largely beak-shaped, and a C-shaped copulative lamella.

Locus typicus. Macedonia, Baba Mts., Malovište, Šemnica valley, 1600-1800 m.

Type series. HT ♂: Macedonia, Baba Mts., Malovište, Šemnica valley, 1600-1800 m, 11-12.VI.2008, P. Moravec leg. (reg. silv.) (CGi).

Description of the ♂ HT. L 2.52 mm (UL 2.71 mm). Body (fig. 20) moderately long and narrow, depigmented, yellow-testaceous, with antennae, palpi and legs lighter; shiny integuments, with an evident microsculpture of an isodiametric mesh, covered with a sparse and short pubescence.

Head robust, slightly hypertrophic, narrower than the pronotum, anophthalmous. Antennae robust, neatly moniliform starting from the fourth antennomere, neatly exceeding the base of the pronotum when stretched backwards. Fronto-clypeal furrow slightly distinct; anterior margin of the epistome subrectilinear. Two supraorbital setae on each side, not so close to each other, on lines neatly converging backwards. Mandibles short, simple, without dorsal ridges, premolar tooth developed and situated, on the right mandible, in a basal position, before the anterior margin of the labrum. Labrum provided with 6 anterior marginal setae.

Pronotum slightly transverse (PW/PL = 1.43), with the maximum width at the base of the anterior third, narrowed at the base, with sides longly and regularly arcuate, slightly sinuate before the base, not denticulate neither emarginate before the basal angles (fig. 23). Anterior angles rounded, not prominent; the posterior ones subrectangular, not denticulate at the tip. Disk faintly convex, with a short and sparse pubescence; median groove deep and evident. Marginal groove wide and flattened, not restricted but enlarged near the base, anterior marginal setae inserted inside the marginal groove, roughly at the base of the anterior fourth; basal setae well before the posterior angles.

Elytra squared, short and parallel (EL/EW = 1.51), with the maximum width at the apical third, emarginate in the preapical area. Disk poorly convex, subflat; shiny integuments, with a very evident microsculpture of an isodiametric mesh. Humeri marked but rounded; posthumeral margin denticulate, with a very fine but distinct crenellation up to the height of the 1st discal pore; elytral apices separately and broadly rounded. Marginal groove wide and evident up to the height of the apical emargination.

Chaetotaxy: basal umbilicate pore big, foveate. Umbilicate series of type B; 3rd pore of the umbilicate series slightly closer to the 2nd than the latter to the 1st; 4th pore decidedly farther and placed beyond the basal third of the elytron and beyond the anterior discal seta; 5th pore placed

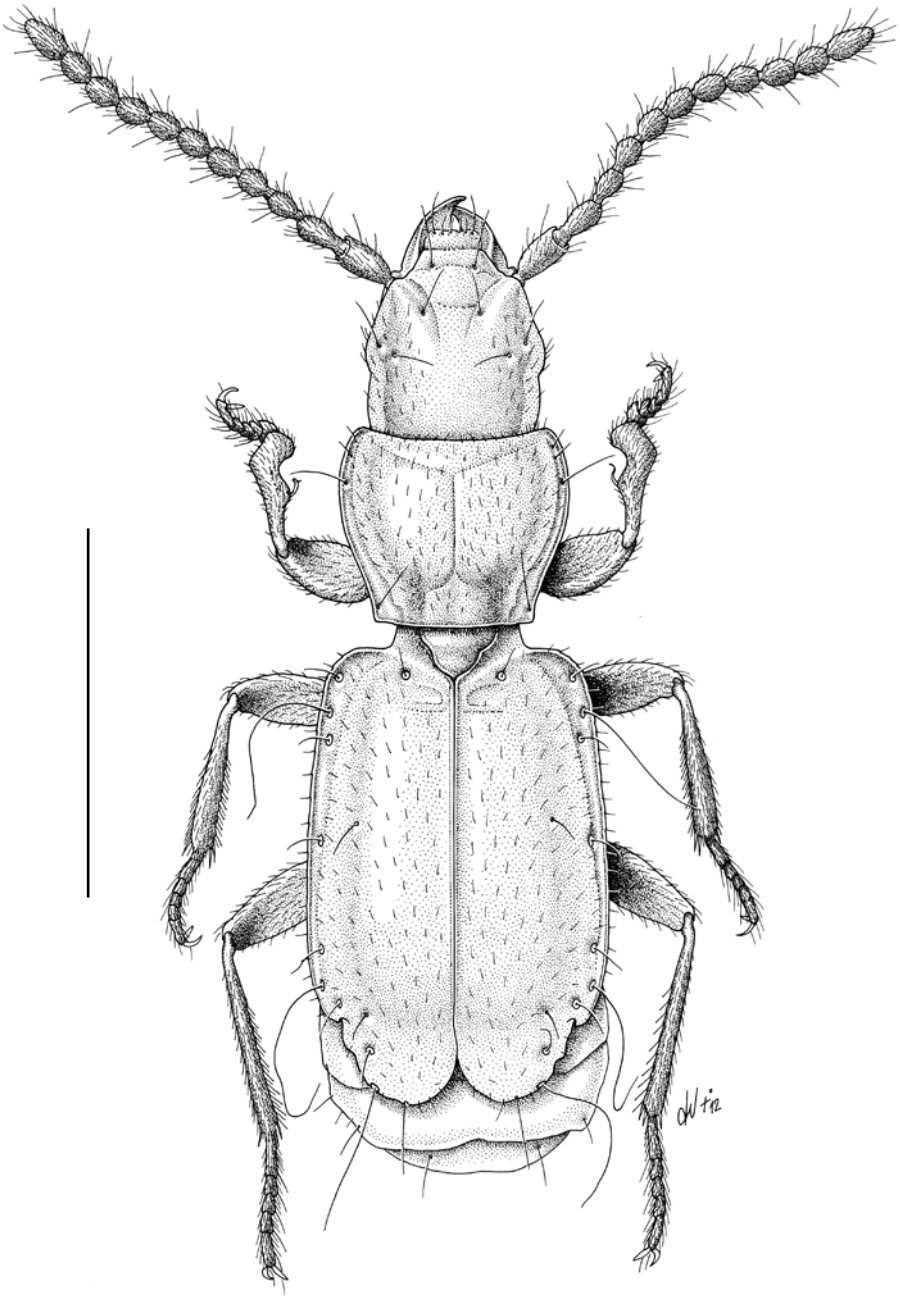
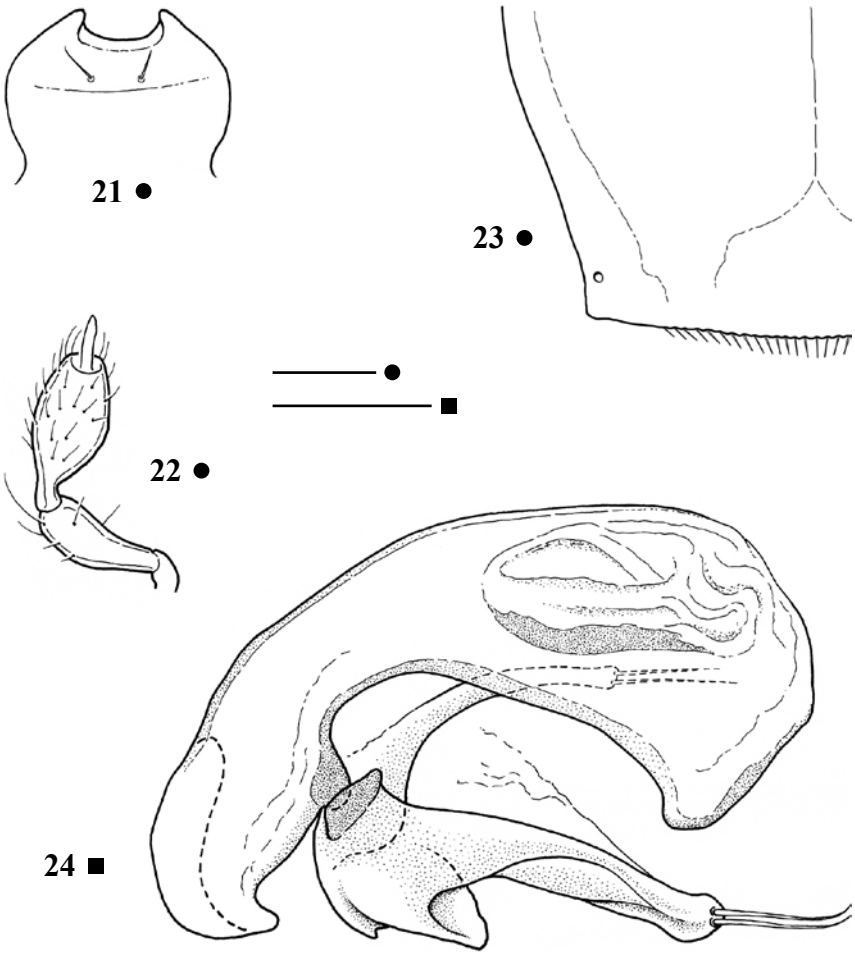


Fig. 20 – *Winklerites moraveci* n. sp.: habitus of the HT ♂. Scale bar: 1 mm.

roughly at the apical third of the elytron; 5th, 6th and 7th pores almost equidistant from each other, with the 6th and 7th slightly closer; the 8th one shifted onto the disk and aligned with the posterior discal seta; the 7th, 8th and 9th not equidistant from each other (with a distance between the 7th and the 8th less than the double of the distance between the 8th and the 9th). Two discal pores: the 1st one placed after the base of the anterior third of the elytron and well before the 4th pore of the umbilicate series, while the 2nd one is located after the level of the 7th.



Figs 21-24 – *Winklerites moraveci* n. sp.: HT ♂, profile of the labium (21); maxillary palp (22); basal angle of the pronotum (23); aedeagus in lateral view (24). Scale bars: 0.1 mm.

Aedeagus (fig. 24) relatively big, shortly arcuate; median lobe twisted on the right side, and ventral margin, in lateral view, subrectilinear before the apex, that is very enlarged, largely beak-shaped, with the apical blade largely and irregularly rounded, not prolonged backwards ventrally into a chitinized edge. Inner sac provided with a large, well chitinized, C-shaped, concave, copulative lamella. Parameres unequal, elongated, provided with two apical setae each.

ETYMOLOGY. We are pleased to dedicate this new and interesting species to our Czech colleague Pavel Moravec, who collected the first specimen.

DISTRIBUTION AND ECOLOGY. *W. moraveci* n. sp. is currently known only from the type locality of Malovište (Šemnica valley) situated in the Baba planina (Macedonia) at 1600-1800 m a.s.l. In this site a single specimen of *W. moraveci* n. sp. was found under deeply embedded rocks in a *Fagus* forest.

«Group of *W. hercegovinensis*» (sensu Guéorguiev 2007)

Winklerites fodori Guéorguiev (figs 25-29)

MATERIAL EXAMINED. 1 ♂ 3 ♀♀, Macedonia, Šar pl. Mts., Tetovo, Popova Šapka env., 1600-1700 m, 18-20.VI.2008, P. Moravec leg. (reg. silv.) (CGi, CMo); 9 ♂♂ 2 ♀♀, Macedonia, Šar pl. Mts., Tetovo, Popova Šapka env., 1600-1700 m, 18-20.VI.2008, P. Vonička leg. (reg. silv.) (CBu, CGi, CVa, CVo); 14 ♂♂ 7 ♀♀, Macedonia, Šar pl. Mts., Tetovo, Popova Šapka env., 1600-1700 m, 18-20.VI.2008, L. Blažej leg. (reg. silv.) (CBl, CBu, CGi, CVa); 16 ♂♂ 4 ♀♀, Macedonia, Šar pl. Mts., Tetovo, Popova Šapka env., 1600-1700 m, 18-20.VI.2008, V. Ševčik leg. (reg. silv.) (CBl, CBu, CGi, CVa).

REDESCRIPTION. L 2.19-2.63 mm (UL 2.34-2.80 mm). Body (fig. 25) moderately long and narrow, depigmented, uniformly yellow-testaceous; shiny integuments, with an evident microsculpture of an isodiametric mesh, covered with a sparse and short pubescence.

Head robust, slightly hypertrophic, narrower than the pronotum, anophthalmous. Antennae robust, neatly moniliform starting from the fourth antennomere, neatly exceeding the base of the pronotum when stretched backwards. Fronto-clypeal furrow slightly distinct; anterior margin of the epistome subrectilinear. Two supraorbital setae on each side, not so close to each other, on lines neatly converging backwards. Mandibles

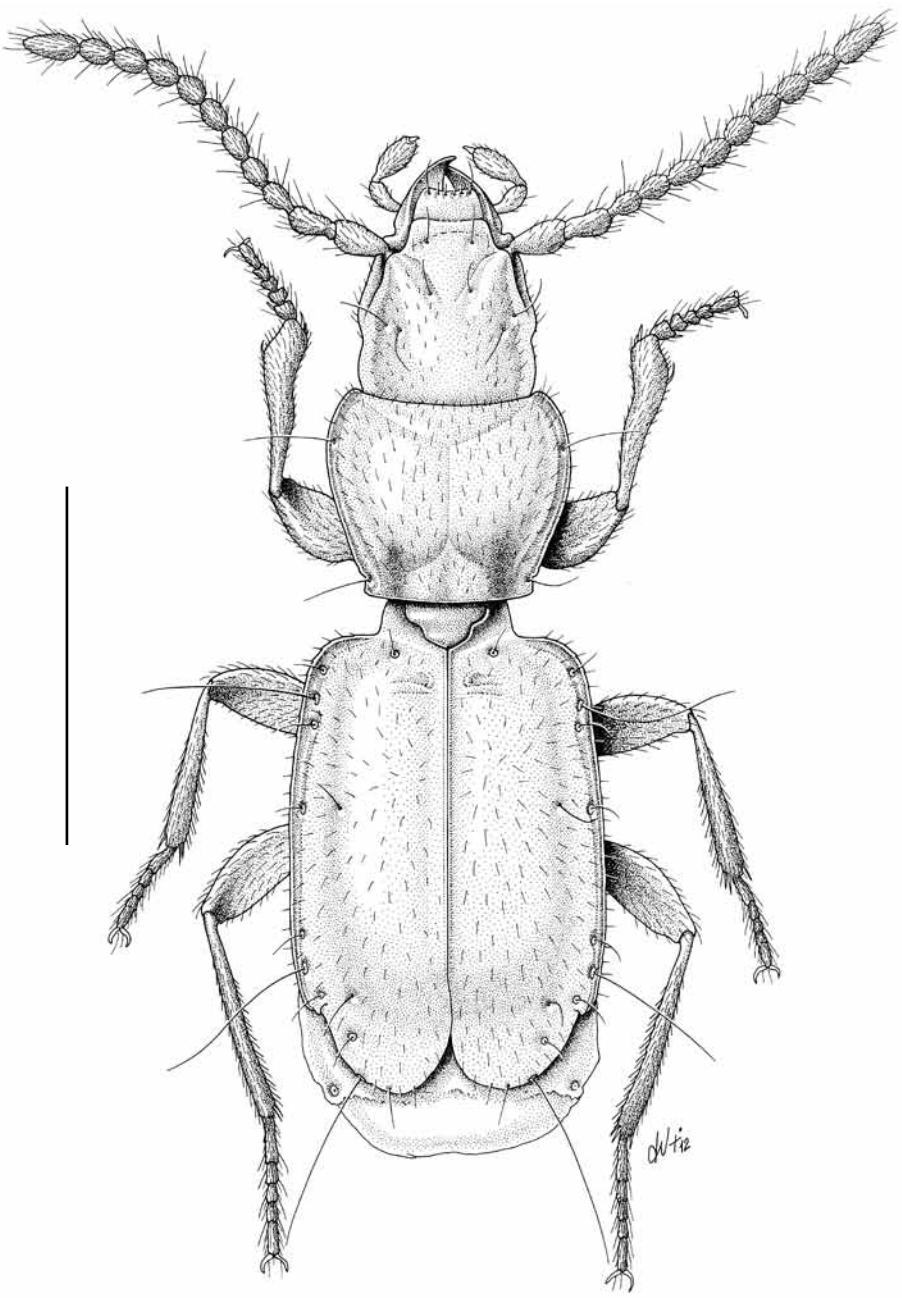
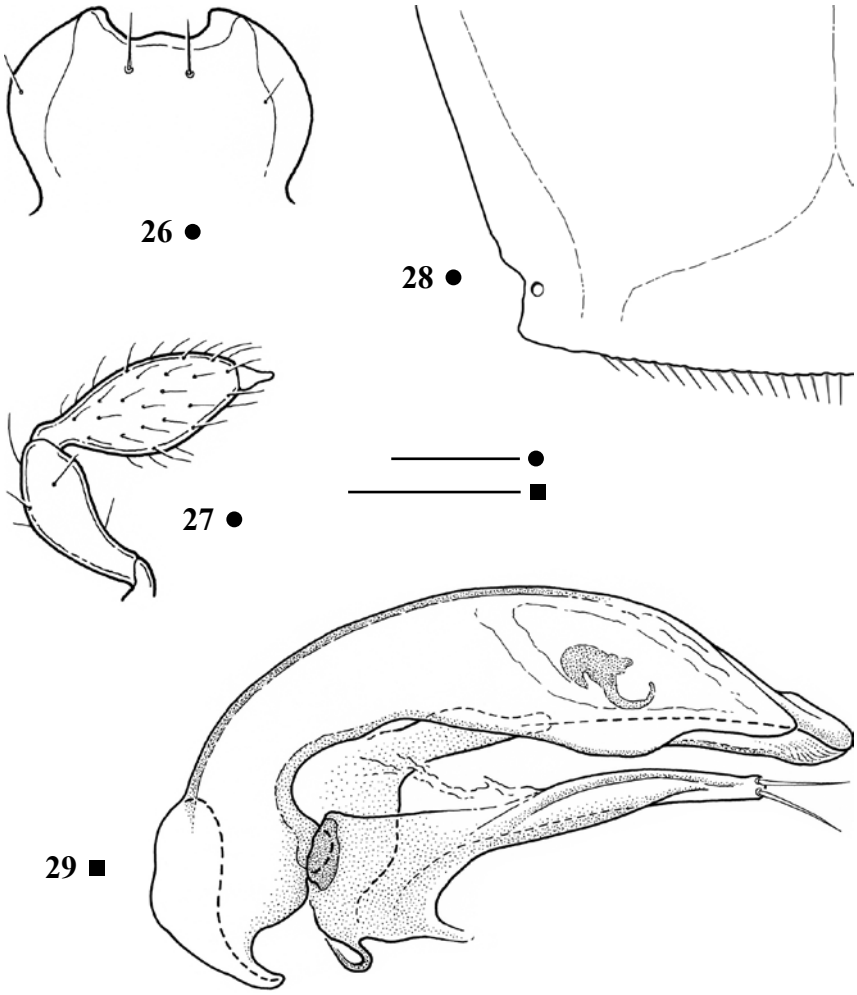


Fig. 25 – *Winklerites fodori* Guéorguiev: habitus of the ♂. Scale bar: 1 mm.

short, simple, without dorsal ridges, premolar tooth developed and situated, on the right mandible, in a basal position, before the anterior margin of the labrum. Labrum provided with 6 anterior marginal setae.

Pronotum slightly transverse (PW/PL = 1.33 ♂ 1.34 ♀), with the maximum width at the base of the anterior fourth, narrowed at the base, with sides longly and regularly arcuate, subrectilinear before the base, hardly emarginate before the basal angles (fig. 28). Anterior angles



Figs 26-29 – *Winklerites fodori* Guéorguiev: ♂, profile of the labium (26); maxillary palp (27); basal angle of the pronotum (28); aedeagus in lateral view (29). Scale bars: 0.1 mm.

rounded, slightly prominent; the posterior ones subrectangular, not denticulate at the tip. Disk faintly convex, with a short and sparse pubescence; median groove deep and evident. Marginal groove wide and flattened, not restricted but slightly enlarged near the base, anterior marginal setae inserted inside the marginal groove, roughly at the base of the anterior fourth; basal setae well before the posterior angles.

Elytra ovoidal, short and not parallel (EL/EW = 1.43 ♂ 1.42 ♀), with the maximum width at the apical third, emarginate in the preapical area. Disk poorly convex, subflat; shiny integuments, with a very evident microsculpture of an isodiametric mesh. Humeri marked but rounded; posthumeral margin denticulate, with a very fine but distinct crenellation up to the height of the 1st discal pore; elytral apices separately and broadly rounded. Marginal groove wide and evident up to the height of the apical emargination.

Chaetotaxy: basal umbilicate pore big, foveate. Umbilicate series of type B; 3rd pore of the umbilicate series slightly closer to the 2nd than the latter to the 1st, 4th pore decidedly farther and placed beyond the basal third of the elytron at the level of the anterior discal seta; 5th pore placed roughly at the apical third of the elytron; 5th, 6th and 7th pores almost equidistant from each other, the 8th one shifted onto the disk and aligned with the posterior discal seta; the 7th, 8th and 9th equidistant from each other. Two discal pores: the 1st one placed after the base of the anterior third of the elytron and at the level of the 4th pore of the umbilicate series, while the 2nd one is located at the level of the 7th.

Aedeagus (fig. 29) relatively big, shortly arcuate; median lobe twisted on the right side; left lateral side, in lateral view, expanded preapically and partially overlapping the apical blade that is subrectilinear before the apex, irregularly rounded and prolonged backwards ventrally into a strongly chitinized edge that reaches the middle of the median lobe. Inner sac provided with a small, well chitinized, subglobular and sometimes hooked, copulative lamella. Parameres unequal, elongated, provided with two apical setae each.

Distribution and ecology. *W. fodori* is currently known from the type locality of Turcin planina and from the second nearby locality of Popova Šapka (Guéorguiev 2007). Our material comes from the latter locality: Popova Šapka, near Tetovo (Šar planina, Macedonia) at 1600-1700 m a.s.l. In this site *W. fodori* was found under deeply embedded rocks in a *Fagus* forest.

Winklerites g u e o r g u i e v i n. sp. (figs 30-35)

DIAGNOSIS. A *Winklerites* of 2.16-2.41 mm, belonging to the group of *W. hercegovinensis* (Winkler, 1925) (sensu Guéorguiev 2007) for the shape of the median lobe of the aedeagus.

Winklerites gueorguievi n. sp. differs from *W. fodori* Guéorguiev, 2007 in the less evident basal emargination of the pronotum sides, the more stubby elytra with more evident humeri, the more advanced position of the first discal pore, the median lobe of the aedeagus with a ventral margin very curved, more largely bisinuate before the apex that is not enlarged, a more narrowed apical blade.

LOCUS TYPICUS. Macedonia, Šar (Ničpurska) pl. Mts., Pečkovo, 1500-1800 m ca.

TYPE SERIES: HT ♂: Macedonia, Šar (Ničpurska) pl. Mts., Pečkovo, 1500-1800 m ca, 17.VI.2008, P. Moravec leg. (reg. silv.) (CGi).

PTT: 4 ♂♂ 3 ♀♀, Macedonia, Šar (Ničpurska) pl. Mts., Pečkovo, 1500-1800 m ca, 17.VI.2008, P. Moravec leg. (reg. silv.) (CGi, CMo); 5 ♂♂ 3 ♀♀, Macedonia, Šar (Ničpurska) pl. Mts., Pečkovo, 1500-1800 m ca, 17.VI.2008, P. Vonička leg. (reg. silv.) (CBu, CGi, CVo); 8 ♂♂ 9 ♀♀, Macedonia, Šar (Ničpurska) pl. Mts., Pečkovo, 1500-1800 m ca, 17.VI.2008, L. Blažej leg. (reg. silv.) (CBl, CBu, CGi, CVa).

DESCRIPTION. L 2.16-2.41 mm (UL 2-31-2.78 mm). Body (fig. 30) moderately long and narrow, depigmented, yellow-testaceous, with antennae, palpi and legs lighter; shiny integuments, with an evident microsculpture of an isodiametric mesh, covered with a sparse and short pubescence.

Head robust, slightly hypertrophic, narrower than the pronotum, anophthalmous. Antennae robust, neatly moniliform starting from the fourth antennomere, neatly exceeding the base of the pronotum when stretched backwards. Fronto-clypeal furrow slightly distinct; anterior margin of the epistome subrectilinear. Two supraorbital setae on each side, not so close to each other, on lines neatly converging backwards. Mandibles short, simple, without dorsal ridges, premolar tooth developed and situated, on the right mandible, in a basal position, before the anterior margin of the labrum. Labrum provided with 6 anterior marginal setae.

Pronotum practically not transverse (PW/PL = 1.17 ♂ 1.22 ♀), with the maximum width at the base of the anterior fourth, narrowed at the base, with sides longly and regularly arcuate, subrectilinear before the base, emarginate before the basal angles (fig. 33). Anterior angles round-

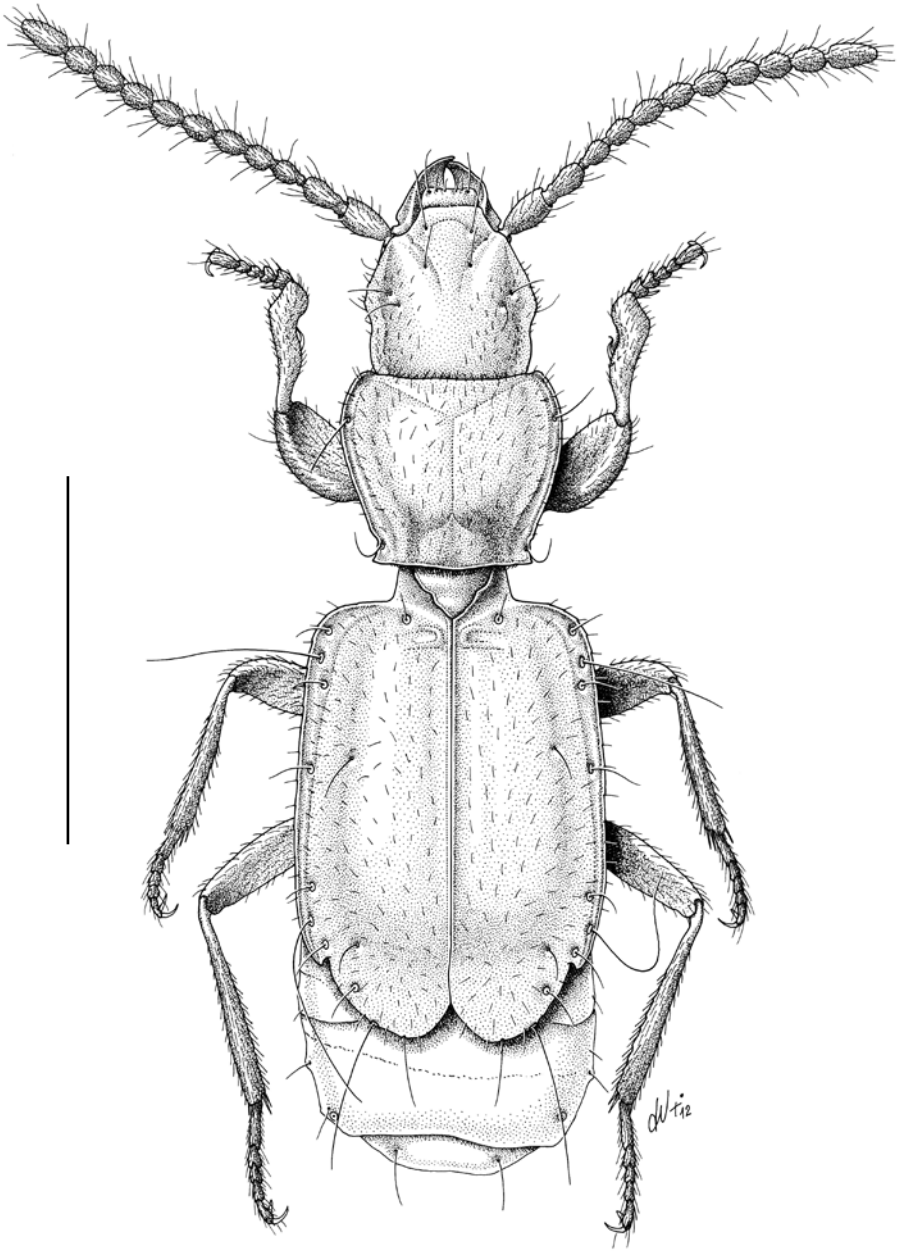


Fig. 30 – *Winklerites gueorguievi* n. sp.: habitus of the HT ♂. Scale bar: 1 mm.

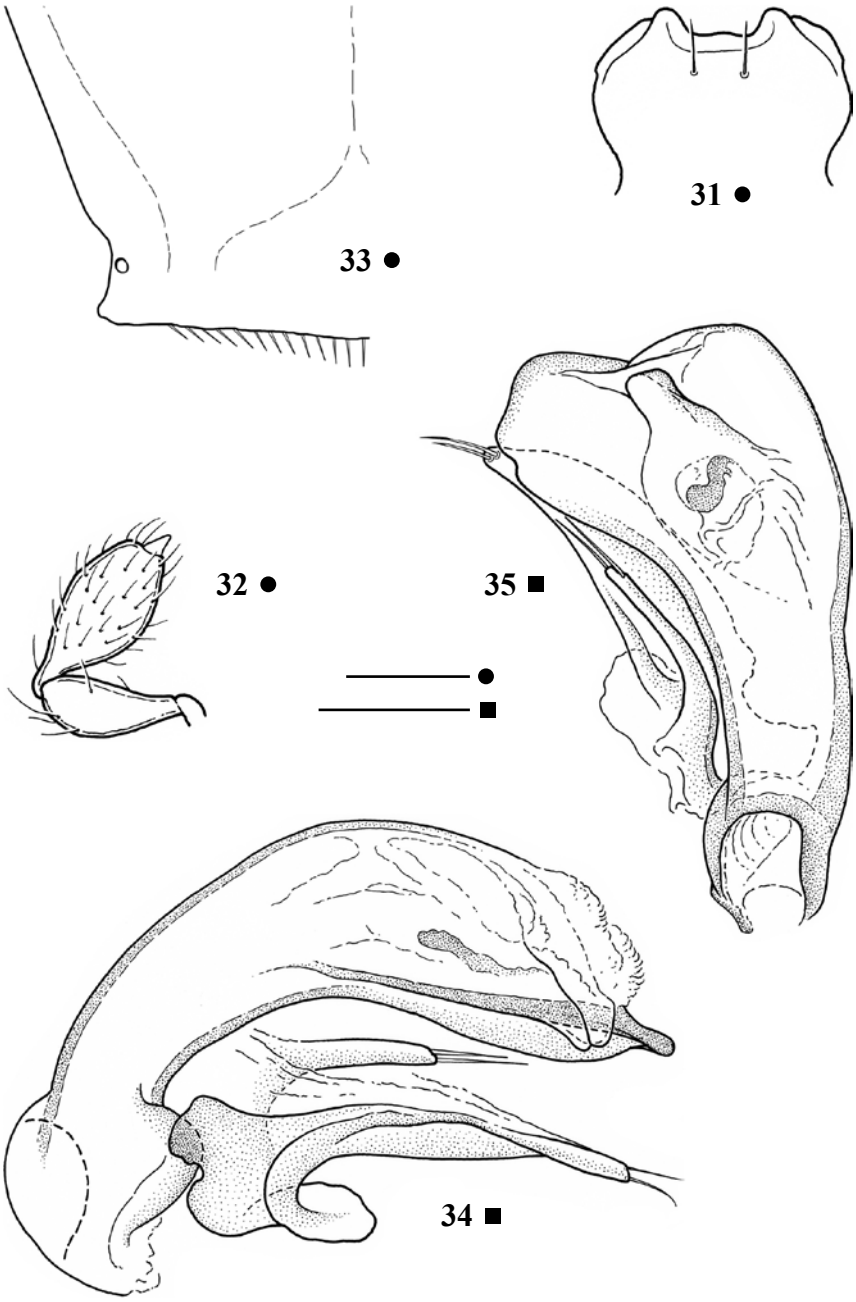
ed, slightly prominent; the posterior ones subrectangular to subacute, not denticulate at the tip. Disk faintly convex, with a short and sparse pubescence; median groove deep and evident. Marginal groove wide and flattened, not restricted but slightly enlarged near the base, anterior marginal setae inserted inside the marginal groove, roughly at the base of the anterior fourth; basal setae well before the posterior angles.

Elytra ovoidal, short and not parallel (EL/EW = 1.39 ♂ 1.38 ♀), with the maximum width at the apical third, emarginate in the preapical area. Disk poorly convex, subflat; shiny integuments, with a very evident microsculpture of an isodiametric mesh. Humeri marked but rounded; posthumeral margin denticulate, with a very fine but distinct crenellation up to the height of the 1st discal pore; elytral apices separately and broadly rounded. Marginal groove wide and evident up to the height of the apical emargination.

Chaetotaxy: basal umbilicate pore big, foveate. Umbilicate series of type B; 3rd pore of the umbilicate series slightly closer to the 2nd than the latter to the 1st, 4th pore decidedly farther and placed beyond the basal third of the elytron just after the level of the anterior discal seta; 5th pore placed roughly at the apical third of the elytron; 5th, 6th and 7th pores almost equidistant from each other, the 8th one shifted onto the disk and aligned with the posterior discal seta; the 7th, 8th and 9th not equidistant from each other, with the 7th and 8th pores slightly closer to each other than the latter to the 9th. Two discal pores: the 1st one placed roughly at the base of the anterior third of the elytron and at the level of the 4th pore of the umbilicate series, while the 2nd one is located at the level of the 7th.

Aedeagus (figs 34-35) relatively big, longly arcuate; median lobe twisted on the right side, and ventral margin, in lateral view, largely bisinuated before the apex, that is not enlarged, with a large apical blade prolonged backwards ventrally into a strongly chitinized edge that reaches the middle of the median lobe. Median lobe, in dorsal view, strongly curved on the right side, apical blade very enlarged, squared, subtruncate and emarginate at the right apical angle. Inner sac provided with a small, well chitinized, subglobular, copulative lamella. Parameres unequal, elongated, provided with two apical setae each.

Etymology. We dedicate this interesting species with pleasure, as a token of friendship, to Borislav Guéorguiev of the National Natural History Museum of Sofia (Bulgaria), who described the first Anillina of Macedonia.



Figs 31-35 – *Winklerites gueorguievi* n. sp.: HT ♂, profile of the labium (31); maxillary palp (32); basal angle of the pronotum (33); aedeagus in lateral view (34); aedeagus in dorsal view (35). Scale bars: 0.1 mm.

Distribution and ecology. *W. gueorguievi* n. sp. is currently known only from the type locality of Pečkovo (Lera Mt.) situated in Šar (Ničpurska) planina (Macedonia) at 1500-1800 m a.s.l. In this site *W. gueorguievi* n. sp. was found under deeply embedded rocks in a *Fagus* forest.

Final considerations. The analysis of the ecological data available on these new species, as previously pointed out by Giachino & Vailati (2011), confirm that the Anillina species present in the southern part of the Balkan Peninsula (Greece and Macedonia) should be considered, as a whole, as elements typically deeply endogean and not belonging to the fauna of the forest litter and of the humus layer of the soil. All the specimens of *Winklerites* studied in this contribution were collected beneath deeply buried rocks, in contact with the layer of clay present under the humus. The other two species of Anillina treated in this paper, and belonging to the genus *Prioniomus*, were collected not in humus but, by deep traps baited with cheese, in the Superficial Subterranean Environment. Anyway, all these species show morphologies perfectly compatible with those of the typical endogean elements (sensu Coiffait 1958).

The analysis of the known distribution of the Anillina of Greece, as discussed by Giachino & Vailati 2011), and now of Macedonia (figs 36-37), highlights that it is practically unknown, or nearly so, in areas of great zoogeographic importance.

The genus *Winklerites* shows a distribution in Macedonia of two groups. The group of *W. weiratheri* (sensu Giachino & Vailati 2011), previously known from Northern Greece (*W. weiratheri* of Falakro Oros, *W. lagrecai* Casale, Giachino & Etonti of Oros Menikion, *W. luisae* Giachino & Vailati, 2011 of Oros Páïko, *W. casalei* Giachino & Vailati, 2011 of Oros Vérmio, *W. zaballosi* Giachino & Vailati, 2011 of Oros Vitsi, *W. vailatii* Giachino, 2001 of Oros Northern Vérmio and *W. thracicus* Giachino & Vailati, 2011 of Gerakas), with *W. vonickai* n. sp., *W. blazeji* n. sp. and *W. moraveci* n. sp., reaches the Western and the South-Western part of Macedonia. The group of W. *hercegovinensis* (sensu Guéorguiev 2007) previously known from Dalmatia and Crna Gora (W. *hercegovinensis* (Winkler, 1925) of Trebinje, *W. paganettii* (J. Müller, 1911) of Krivosije, *W. durmitorensis* Nonveiller & Pavicevic, 1987 of Durmitor and *W. kuciensis* Nonveiller & Pavicevic, 1987 of Komovi planina), with *W. fodori* and *W. gueorguievi* n. sp., reaches the North-Western part of Macedonia.

All the *Winklerites* species of Macedonia, similarly to what has been shown by Giachino & Vailati (2011) for the Greek species, appear, each within their own group, well differentiated but very homogeneous in the morphology of the aedeagus, indicating sure allopatric speciation events on different mountain massifs; almost certainly not very recent events. The new species of *Prioniomus* described here, the first one from Notía Pindos (*P. maleficus* n. sp.) and the second one from North Peloponnese (*P. caoduroi* n. sp.), confirm, following Giachino & Vailati (2011), that

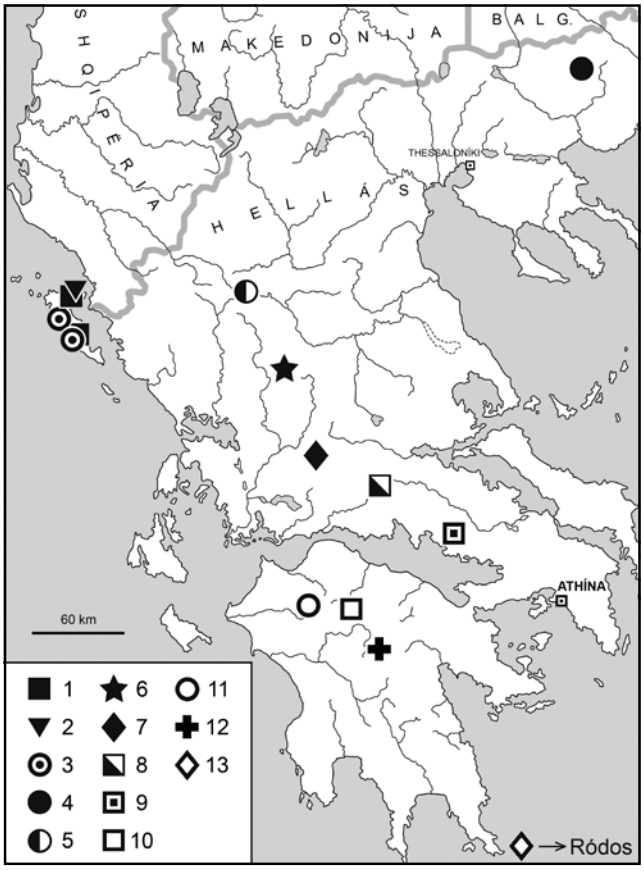


Fig. 36 – Distribution map of the known Greek species of the genus *Prioniomus*: *P. moczarskii* (1), *P. cassiopaeus* (2), *P. abnormis* (3), *P. etontii* (4), *P. maleficus* n. sp. (5), *P. scaramozzinoi* (6), *P. gabriellae* (7), *P. giachinoi* (8), *P. vailatii* (9), *P. caoduroi* n. sp. (10), *P. antonellae* (11), *P. peloponnesiacus* (12), *P. menozzii* (of the Island of Ródos, is ouside the map) (13).

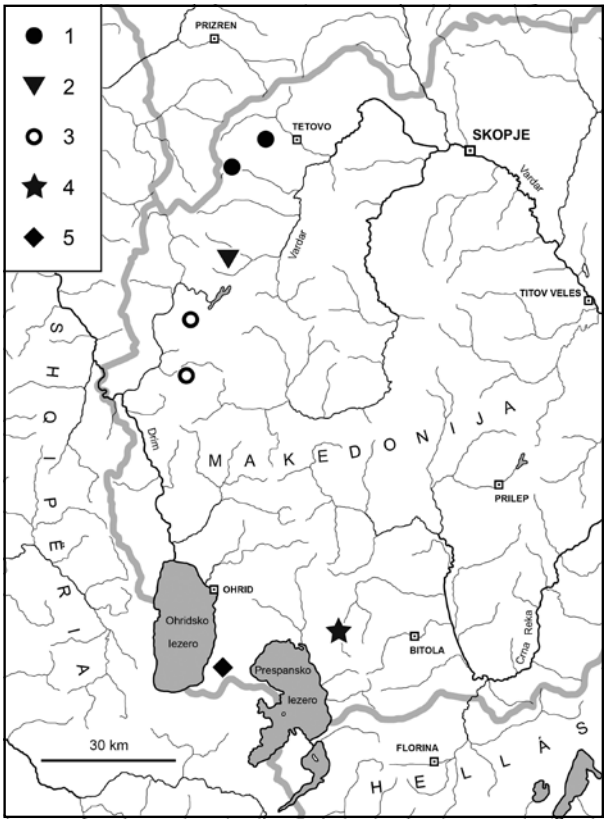


Fig. 37 – Distribution map of the known Macedonian species of the genus *Winklerites*: *W. fodori* (1), *W. gueorguievi* n. sp. (2), *W. vonickai* n. sp. (3), *W. moraveci* n. sp. (4), *W. blazeji* n. sp. (5).

this genus is uniformly spread, in the North and South of the Transaegean trough, and that this has not influenced their distribution (Popov et al. 2004).

ACKNOWLEDGEMENTS. We are grateful to all our friends and Czech colleagues who have provided or collected the material studied, Lukáš Blažej (Děčín), Petr Bulirsch (Praha), Peter Hlaváč (Kosice), Pavel Moravec (Litoměřice) and Pavel Vonička (Liberec). We are particularly indebted to Lukáš Blažej, Pavel Moravec and Pavel Vonička who kindly accepted to depose the holotypes in P.M. Giachino's collection. We also wish to acknowledge here the unconditional support provided by Gianfranco Caoduro, Chairman of the World Biodiversity Association onlus, to our research in Greece. Finally, an additional thank to Achille Casale for his helpful suggestions to the original manuscript.

SUMMARY

A revision of the Anillina of Macedonia is given, with the description of the following new species of *Winklerites* Jeannel, 1937: *W. vonickai* n. sp. from Bistra planina, *W. blazeji* n. sp. from Galičica Mts., *W. moraveci* from Baba Mts. and *W. gueorguievi* from Ničpurska (Šar planina). *W. fodori* Guéorguiev, 2007, is redescribed on material coming from a site near the type locality. *Prioniomus maleficus* n. sp. from Katara pass (Notía Pindos, nom. Tríkala, NW Greece) and *P. caoduroi* n. sp. from the road Kasteli-Kalavrita (nom. Ahaïa, Peloponnese, Greece) are also described. Ecological and chorological data of some species are given and zoogeographical hypotheses are discussed.

RIASSUNTO

Revisione degli Anillina di Macedonia e descrizione di due specie nuove di Prioniomus *della Grecia (Coleoptera, Carabidae)*.

Viene fornita la revisione degli Anillina di Macedonia, con la descrizione delle seguenti specie nuove di *Winklerites* Jeannel, 1937: *W. vonickai* n. sp. della Bistra planina, *W. blazeji* n. sp. del massiccio della Galičica, *W. moraveci* del massiccio di Baba and *W. gueorguievi* di Ničpurska (Šar planina). *W. fodori* Guéorguiev, 2007, viene ridescritto su materiale proveniente da una stazione vicina alla località tipica.Vengono inoltre descritti *Prioniomus maleficus* n. sp. del Passo Katara (Notía Pindos, nom. Tríkala, NW Grecia) e *P. caoduroi* n. sp. di una stazione sita lungo la strada Kasteli-Kalavrita (nom. Ahaïa, Peloponneso, Grecia).Vengono inoltre forniti dati ecologici e corologici sulle specie trattate e discusse alcune ipotesi zoogeografiche.

REFERENCES

Casale, A., P.M. Giachino & M. Etonti. 1990. Nuovi Coleotteri endogei e cavernicoli (Carabidae Trechinae e Bembidiinae, Cholevidae Bathysciinae) della Grecia nord-orientale e dei Rodopi Bulgari, e loro significato zoogeografico. Bollettino del Museo regionale di Scienze naturali di Torino, 8(2): 545-580.

Coiffait, H. 1958. Les Coléoptères du sol. Suppl, Vie et Milieu, 7: 204 pp.

Euro Atlas. 1990/91. Greece 1:300.000. Studio F.M.B., Bologna: 88-16 p.

Giachino, P. M. & D. Vailati. 2011. Review of the Anillina of Greece (Coleoptera, Carabidae, Bembidiini). Biodiversity Journal, monograph, 1: 1-112.

Guéorguiev, B.V. 2007. *Winklerites fodori* sp. n. and systematic position of *Duvalius* (*Duvalius*) *fodori* Scheibel (Coleoptera, Carabidae, Trechinae). Acta Zoologica Academiae Scientiarum Hungaricae, 53(2): 107-115.

Lorenz, W. 2005. Systematic list of extant Ground Beetles of the World (Insecta Coleoptera "Geadephaga": Trachypachidae and Carabidae incl. Paussinae, Cicindelinae, Rhysodinae). Tutzing, 530 pp.

Popov, S. V., F. Rögl, A. Y.Rozanov, F. F. Steininger, I. G. Shcherba & M. Kovac (eds.). 2004. Lithological-Paleogeographic maps of Paratethys. 10 Maps late Eocene to Pliocene. Courier Forschungsinsitut Senckenberg, 250: 1-46, 10 maps.