

New species of *Winklerites* from eastern Serbia (Coleoptera: Carabidae: Trechinae)¹

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Abstract. *Winklerites stevanovici* sp. nov., of the *W. hercegovinensis* (Winkler, 1925) species group (sensu GUÉORGUIEV 2007) (Coleoptera: Carabidae: Trechinae: Anillini: Scotodipnina), is described from eastern Serbia. Male and female genitalia as well as the habitus are illustrated. The new species is separated from all other species of the group, especially from the very similar *W. serbicus* Čurčić et al., 2013, by supraorbital setae more distant, posterior pronotal angles pointed and prominent, different position of setae of umbilicate series, median lobe of aedeagus in lateral view with triangular apex longer and slender, with well defined pre-apical ventral gibbosity and shorter parameres. The distributional map of all species of the *W. hercegovinensis* group is provided.

Key words. Coleoptera, Carabidae, Trechinae, Anillini, *Winklerites*, new species, biospeleology, Serbia, Balkan Peninsula, Palaearctic Region

Introduction

The genus *Winklerites* was established by JEANNEL (1937) in his first monograph of the tribe Anillini to accommodate six species previously attributed to the genus *Microtyphlus* Linder, 1863. He divided them in the nominotypical subgenus and *Caecoparvus* Jeannel, 1937. COIFFAIT (1956) described *Parvocaecus* Coiffait, 1956 as a third subgenus of *Winklerites* with two new species from Turkey. JEANNEL (1963) in his second monograph treated *Caecoparvus* as a valid genus and classified *Winklerites* in his 'série Aphaenodontes' in the phylogenetic lineage of *Microtyphlus*. JEANNE (1973) treated also *Parvocaecus* as a valid genus and established a new system of Anillini where he placed *Winklerites* in the subtribe Scotodipnina of the Aegean origin together with *Parvocaecus*, *Caecoparvus* (south Aegean origin), *Dicropterus* Ehlers,

¹ XIV. Contribution to Endogean and Cavernicolous Coleoptera of the Balkans

1883, *Binaghites* Jeannel, 1937, and *Rhegmatorobius* Jeannel, 1937 (north Aegean or Balcano-Dinaric origin). This classification was accepted by VIGNA TAGLIANTI (1980), GIACHINO (1992) and GIACHINO & VAILATI (2011). The phylogenetic affinity of *Rhegmatorobius* is still not clear and any affiliation to ‘Tyrrhenian’ (e.g. *Geocharis* Ehlers, 1883) or ‘Aegean’ genera (e.g. *Caecoparvus*) is uncertain (MAGRINI & CASALE 2015).

Intraspecific relations of *Winklerites* were first discussed by CASALE et al. (1990) and subsequently by GUÉORGUIEV (2007) who recognized four species groups based mainly on the shape of the aedeagus. *Winklerites perpusillus* (Rottenberg, 1874), the only species of the first group of Guéorguiev, was transferred to the genus *Parvoacaecus* by GIACHINO & VAILATI (2011), and the same authors proposed a new genus *Iason* Giachino & Vailati, 2011 for the second group of Guéorguiev. Later on, GIACHINO & VAILATI (2012) established two new species groups for *Winklerites*, so all species of *Winklerites* are nowadays classified into four species groups: *W. hercegovinensis* (Winkler, 1925), *W. weiratheri* (J. Müller, 1935), *W. andreae* Giachino & Vailati, 2011, and *W. imathiae* Giachino & Vailati, 2011.

Winklerites is an endemic genus of the Balkan Peninsula containing 19 described species. The genus is distributed from Bosnia and Hercegovina, Montenegro, eastern Serbia, western Macedonia to northern Greece (GUÉORGUIEV 2007; GIACHINO & VAILATI 2011, 2012).

Investigation of the endogean fauna of eastern Serbia carried out by our friend Miroslav Stevanović (Niš, Serbia) brought another interesting new species of *Winklerites* which is described below.

Material and methods

Specimens prepared for the morphological study were examined with a Leica S8APO stereomicroscope with diffuse lighting at magnifications up to 128×. The macro photographs reported in the text were made by one of us (PM) using a Nikon D2X digital camera and a Nikon binocular optical microscope applied on Labophot II, with diaphragmed goals. All type specimens were provided with the following red printed label: ‘HOLOTYPE [or PARATYPE], name of the taxon sp. nov., P. Hlaváč and P. Magrini det., 2015’. The material used in this study is deposited in the collections of the National Museum, Prague, Czech Republic (NMPC) and in private collections of Peter Hlaváč, Prague, Czech Republic (CPHP) and Paolo Magrini, Firenze, Italy (CPMF).

Abbreviations used in the text and Appendix:

AN	length of antennomere;
EL	length of elytra measured from base to elytral apex;
EW	maximum width of elytra;
h	handwritten;
HMW	maximum width of head at the level of temples;
L	total body length, from apex of mandibles to the end of elytra;
LA	length of antenna;
LE	length of aedeagus measured in lateral position;
p	printed;
PB	basal width of pronotum;
PL	length of pronotum, measured along midline;
PMW	maximum width of pronotum;

Taxonomy

The genus *Winklerites* is recognized within the subtribe Scotodipnina by having elytra reduced apically with one or more abdominal tergites uncovered, elytra emarginate at the apex at the level of the pore VII of umbilicate series, elytral disc with two setae, base of pronotum without lateral incisions, and sides of pronotum, before the basal angles, not denticulate (GIACHINO & VAILATI 2011).

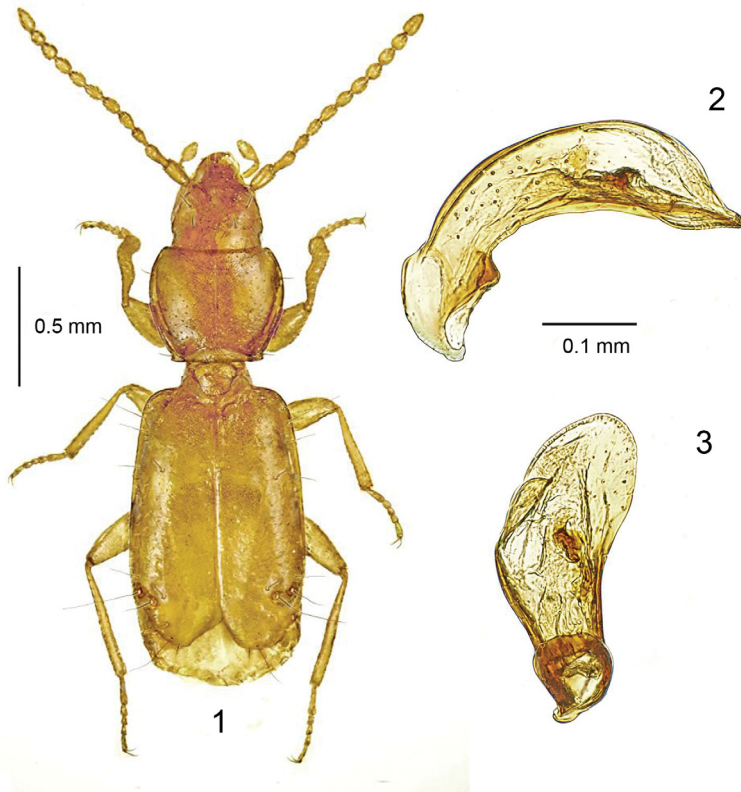
Winklerites stevanovici sp. nov.

(Figs 1–8)

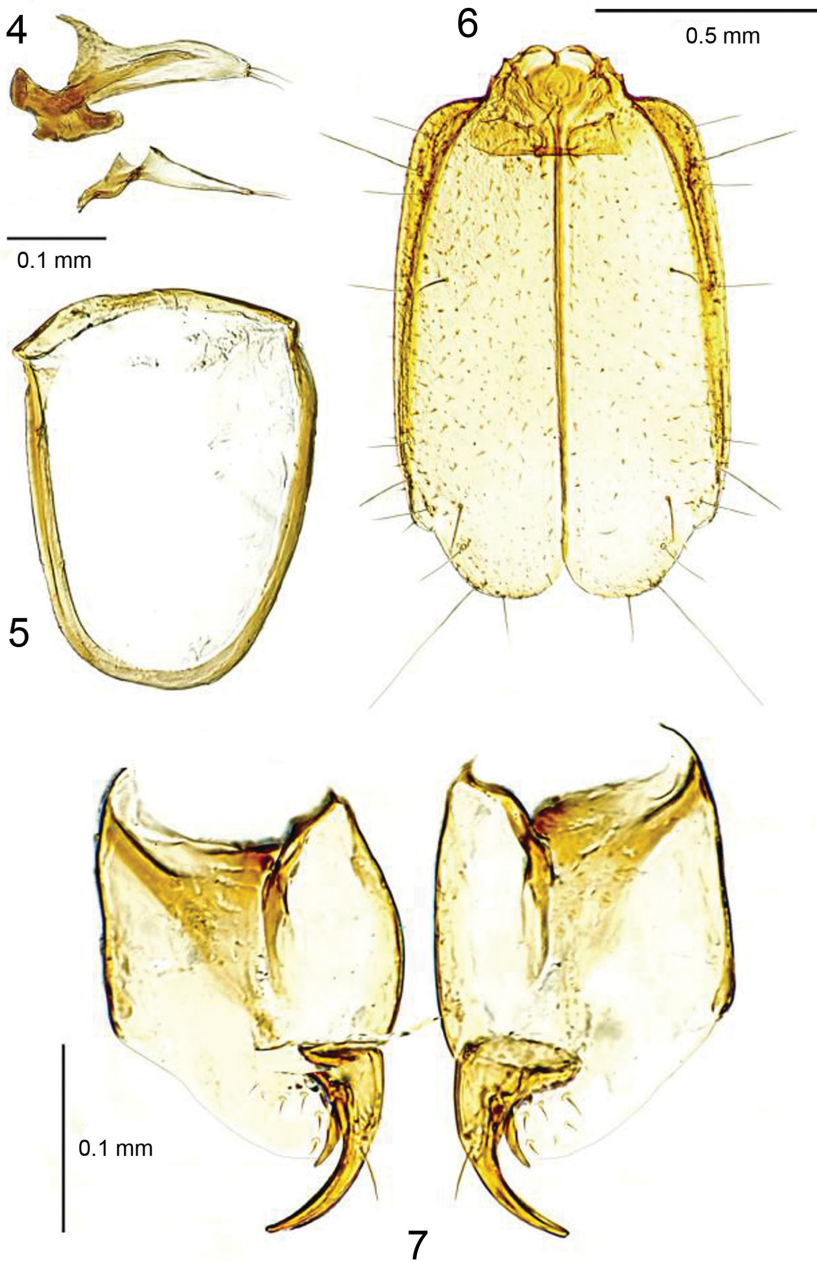
Type locality. Serbia, Pirot District, Dimitrovgrad-Petrlaš, Džemanska Abyss.

Type material. HOLOTYPE: ♂, 'Srbija [p], Dimitrovgrad, Petrlaš, "Džemanska prop[ast] ", 02.05.2002 [h], M. Stevanović leg. [p]' (NMPC). PARATYPES: 4 ♂♂ 1 ♀, same data as holotype (CPHP, CPMF).

Description. Body (Fig. 1) long and narrow, length 2.02–2.21 mm, depigmented, uniformly yellow-testaceous, shiny, head, pronotum and anterior part of elytra with isodiametric mesh,



Figs 1–3. *Winklerites stevanovici* sp. nov. 1 – habitus of ♂ paratype (CPMF); 2–3 – aedagus (♂ paratype, CPMF). (2 – in lateral view, 3 – in ventral view).



Figs 4–7. *Winklerites stevanovici* sp. nov. 4–6 – ♂ paratype, CPMF (4 – parameres, 5 – urite IX, 6 – elytra). 7 – ♀ paratype, CPHP: stylomeres (gonocoxites I and II of ovipositor).

Table 1. Measurements (mm) of *Winklerites stevanovici* sp. nov. For abbreviations see Material and methods (p. 72).

	L	LA	L/LA	PM/W	PL	PB	PMW/PL	EL	EW
Holotypus ♂	2.21	1.02	2.15	0.54	0.48	0.38	1.12	1.08	0.72
min.	2.02	1.02	1.93	0.54	0.46	0.37	1.12	1.06	0.70
max.	2.21	1.06	2.15	0.59	0.50	0.40	1.18	1.11	0.75
average	2.08	1.04	1.99	0.55	0.48	0.38	1.15	1.08	0.72

	EL/EW	EW/PMW	LE	HMW	AN1	AN2	AN3	AN4	AN11
Holotypus ♂	1.48	1.33	0.35	0.38	0.14	0.11	0.09	0.08	0.11
min.	1.40	1.25	0.35	0.37	0.12	0.09	0.08	0.08	0.10
max.	1.56	1.33	0.37	0.40	0.14	0.12	0.09	0.08	0.11
average	1.48	1.29	0.36	0.38	0.13	0.10	0.08	0.08	0.10

shagreened, covered with sparse and short pubescence. Head robust, about as long as wide, narrower than pronotum, ratio: HMW/PMW 0.66–0.70, eyes completely atrophied, frontal furrow short, shallow, as long as half of length of head. Antennae shorter, moniliform, when oriented backwards reaching basal 1/5 of elytral length and reaching level of pore 3 of umbilicate series, scape and pedicel subequal in length, about 1.25 times as long as antennomere III, antennomeres III–X subequal in length, VI–X slightly wider than III–V, terminal antennomere about 1.30 times as long as X. Pronotum slightly transverse (PMW/PL 1.13–1.18), with maximum width before anterior 1/3, not denticulate before posterior angles, pronotal midline shallow, weakly defined. Anterior angles slightly rounded, weakly prominent; posterior ones sharp, prominent, pointed. Disc weakly convex, with short and sparse pubescence. Elytra (Fig. 6) elongate and subparallel, ratio: EL/EW 1.41–1.50, with maximum width behind middle, clearly wider than pronotum, ratio: EW/PMW 1.25–1.33, lacking shallow basal depression, disc poorly convex, humeri broadly rounded. Chaetotaxy (Figs 1, 6): supraorbital setae very distant, about 2/3 of head width, basal umbilicate pore big, foveate. Umbilicate series of type B, i.e. with pores 5–9; distance between pores 1–2 and 2–3 subequal, pore IV much farther, placed slightly above level of anterior third of elytral length at level of anterior discal seta; pore 5 placed somewhat below posterior third of elytral length, pores 4–5 very distant, 1.60 times more distant than pores 3–4; pores 5, 6 and 7 almost equidistant from each other; pores 7, 8 and 9 not equidistant from each other, with distance between pores 7 and 8 about 1.50 times the distance between pores 8 and 9. Two discal pores: pore 1 placed slightly ahead of level of umbilicate pore 4, discal pore 2 located slightly above level of umbilicate pore 7. Urite IX (Fig. 5) ovate, 1.35 times as long as wide, sharply rounded in apical part and very enlarged in basal part. Aedeagus (Figs 2–3) relatively large, longly arcuate; evenly extended to apical part, with short triangular apex, with well defined pre-apical ventral gibbosity, apex rounded and right oriented in ventral view, copulatory piece minuscule, not hooked. Parameres (Fig. 4) unequal, shortly elongated, provided with two apical setae each. Stylomeres (Fig. 7) strongly curved, pointed at apex, strongly chitinized, each gonocoxite I with macrosetae on inner side and single seta on opposite side.

Measurements. See Appendix.

Sexual dimorphism. First two protarsomeres dilated in males as in other *Winklerites*, otherwise not apparent.

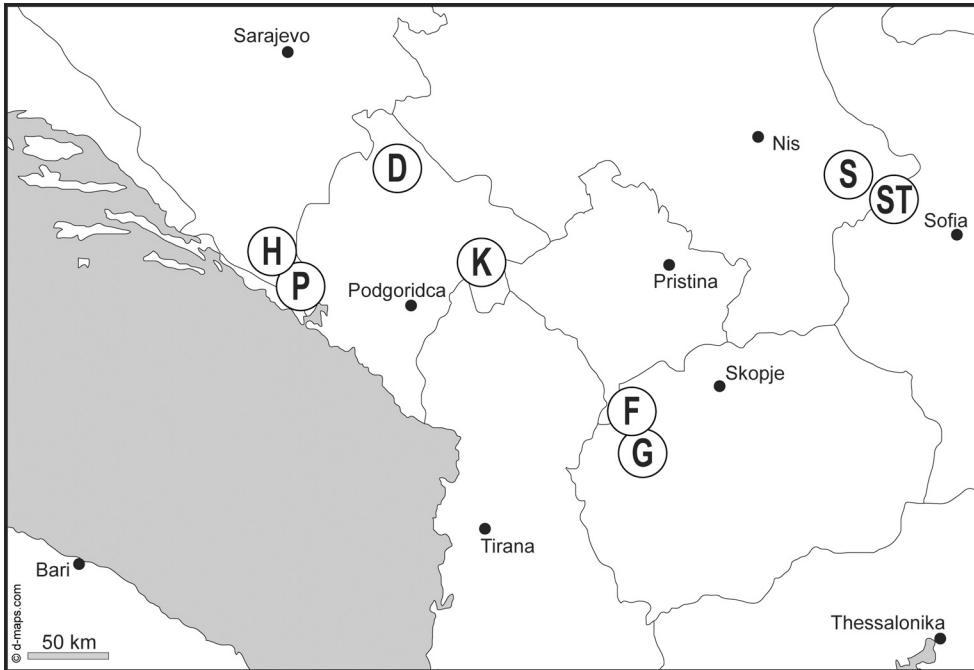


Fig. 8. Distribution map of the *Winklerites hercegovinensis* species-group: D – *W. durmitorensis* Nonveiller & Pavićević, 1987; F – *W. fodori* Guéorguiev, 2007; G – *W. gueorguievi* Giachino & Vailati, 2012; H – *W. hercegovinensis* (Winkler, 1925); K – *W. kuciniensis* Nonveiller & Pavićević, 1987; P – *W. paganettii* (Müller, 1925); S – *W. serbicus* Čurčić et al., 2013; ST – *W. stevanovici* sp. nov.

Differential diagnosis. *Winklerites stevanovici* sp. nov. belongs to the *W. hercegovinensis* species group which is characterized by having the median lobe of aedeagus longly curved in lateral view, apical part wider than basal part, apex pointed, copulatory piece minute, strongly chitinized, and by the presence of a distinct excision on the posterior lateral margin of elytron. It differs readily from *W. durmitorensis* Nonveiller & Pavićević, 1987, *W. kuciniensis* Nonveiller & Pavićević, 1987 and *W. fodori* Guéorguiev, 2007 in the shape of the median lobe which is not hooked. *Winklerites gueorguievi* Giachino & Vailati, 2012 and *W. serbicus* Čurčić et al., 2013 have similar, un-hooked shape of copulatory piece. *Winklerites stevanovici* sp. nov. differs from *W. gueorguievi* in simple widely rounded apex of the median lobe in dorsal or ventral view while *W. gueorguievi* has the apex with two wide lobes. The new species is most similar to *W. serbicus*, for their differentiation see Table 2.

Etymology. Patronymic, named after our friend Miroslav Stevanović (Niš, Serbia) who collected the type material of the new species.

Biology. All specimens were collected under deeply buried stones on the right side of the entrance of the Džemanska propast abyss. This part of the cave was still with some light.

Distribution. The species is so far known only from the type locality in eastern Serbia (Fig. 8).

Table 2. Comparison of *Winklerites serbicus* Čurčić et al., 2013 and *W. stevanovici* sp. nov.

	<i>Winklerites serbicus</i> Čurčić et al., 2013	<i>Winklerites stevanovici</i> sp. nov.
head	slightly longer than wide	as long as wide
frontal furrows	elongate, exceeding half of length of head	shorter, very shallow, as long as half of length of head
supraorbital setae	less distant, distance between them 1/9 of width of head	more distant, distance between them 1/4 of width of head
antennae	longer, when oriented backwards reaching anterior 1/4 of elytra, clearly exceeding level of pore 3 of umbilicate series	shorter, when oriented backwards reaching anterior 1/5 of elytra, reaching level of pore 3 of umbilicate series
pronotal midline	shallow but well defined	shallower, weakly defined
posterior pronotal angles	obtuse, not prominent	sharp, pointed and prominent
elytra: base	with shallow impression	without impression
elytra: humeri	sharp	broadly rounded
elytra: distance between pores 4 and 5 of umbilicate series	approx. 1.35× the distance between pores 3 and 4	approx. 1.60× the distance between pores 3 and 4
median lobe of aedeagus in lateral view	with short triangular apex, lacking pre-apical ventral gibbosity	with longer and slender triangular apex and well defined pre-apical ventral gibbosity
parameres	longer, urite IX narrow, 1.80× as long as wide	shorter, urite IX wide, 1.35× as long as wide

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References

- CASALE A., GIACHINO P. M. & ETONTI M. 1990: Nuovi Coleotteri endogei 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**: 545–580.
- COIFFAIT H. 1956: Notes sur les Anillini. Faune de la Turquie et de France. *Revue Française d'Entomologie* **23**: 77–83.
- ČURČIĆ S., ANTIĆ D., RADJA T., MAKAROV B., ČURČIĆ B., ČURČIĆ N. & LUČIĆ L. 2013: *Winklerites serbicus*, a new endogean species of ground beetles (Coleoptera: Carabidae: Bembidiini) from southeastern Serbia. *Archives of Biological Sciences (Belgrade)* **65**: 773–780.
- GIACHINO P. M. 1992: La distribuzione dei generi *Binaghitus* e *Bathysciola* nelle Alpi Occidentali (Coleoptera: Carabidae e Cholevidae). *Biogeographia* **16**: 401–424.
- GIACHINO P. M. & VAILATI D. 2011: Review of the Anillina of Greece (Coleoptera, Carabidae, Bembidiini). *Biodiversity Journal, Monograph* **1**: 1–112.
- GIACHINO P. M. & VAILATI D. 2012: Review of the Anillina of Macedonia and description of two new species of *Prioniomus* from Greece. *Fragmenta Entomologica* **44**: 33–64.
- 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**: 107–115.

- JEANNE C. 1973: Sur la classification des Bembidiides endogés de la région euro-méditerranéenne (Col. Carabidae, Bembidiinae, Anillini). *Nouvelle Revue d'Entomologie* **3**: 83–102.
- JEANNEL R. 1937: Les Bembidiides endogés. *Revue Française d'Entomologie* **3**: 241–399.
- JEANNEL R. 1963: Monographie des Anillini Bembidiides endogés (Trechidae). *Mémoires du Muséum National d'Histoire Naturelle, Nouvelle Série, Série A, Zoologie* **28**: 33–204.
- MAGRINI P. & CASALE C. 2015: Revisione del genere *Rhegmatorobius* Jeannel, 1937, con descrizione di una nuova specie e una nuova sinonimia (Coleoptera, Carabidae, Bembidiini, Anillina). *Annali del Museo Civico di Storia Naturale 'G. Doria'* **107** (2014): 285–325.
- VIGNA TAGLIANTIA. 1980: Nouvelles données sur la systematique et la répartition géographique des coléoptères carabiques cavernicoles et endogés du Proche-Orient (Coleoptera, Carabidae). *Mémoires du Biospéologie* **7**: 163–172.