

Contribution to the knowledge of European species of the genus *Anostirus*, with description of the *A. bohemicus* sp. n. and *A. platiai* sp. n. (Coleoptera, Elateridae)

Josef Mertlik

Pohřebačka 34, CZ – 533 45 Opatovice nad Labem, Czechia

e-mail: mertlik@elateridae.com

Abstract. The purpose of this paper is the description of *Anostirus bohemicus* sp. n. from the area of northwestern Czechia and *Anostirus platiai* sp. n. from Italy. In addition, the occurrence and morphology of some species of the genus *Anostirus* C. G. Thomson, 1859, known from Alpine region, Apennines, French Massif Central and Pyrenees are discussed: *Anostirus colacurcioi* Platia & Pedroni, 2009, *A. gabilloti* (Pic, 1907), *A. gudenzi* Platia, 1983, *A. lauianus* Wurst, 1994, *A. maccapanii* Platia, 2017, *A. marginatus* Pic, 1931, *A. pseudosulphuripennis* Binaghi, 1940, *A. sulphuripennis sulphuripennis* (Germar, 1843), *A. sulphuripennis penninus* Binaghi, 1940, *A. reissi* (Reitter, 1913), *A. zenii zenii* (Rosenhauer, 1856) and *A. zenii binaghianus* Wurst, 1995. The text is supplemented with new, previously unpublished photographs of the above species. An overview of all records of *A. sulphuripennis sulphuripennis* from Czechia is given.

Key words: Coleoptera, Elateridae, *Anostirus*, taxonomy, distribution, Europe, Alps, Apennines, French Central Highlands, Pyrenees

Material and methods. The material is held in the following collections: Václav Benedikt collection (Plzeň), Petr Brůha collection (Ústí nad Labem), † Zdeněk Doležal collection (in entomological collections of West Bohemian Museum in Pilsen), Václav Dongres collection (Plzeň), Václav Dušánek collection (Zábřeh), Pavel Krásenský collection (Chomutov), Josef Krošlák collection (Plzeň), Vladimír Kubík collection (Chlumec nad Cidlinou), Josef Mertlik collection (Opatovice nad Labem), Oldřich Odvárka collection (Kadaň), Michal Ouda collection (Plasy), Jiří Pávek collection (Nejdek), Filip Pavel collection (Vysoká nad Labem), Milan Putz collection (Řevnice), † Bořivoj Zbuzek collection (in entomological collections of National Museum Prague). Codes of the mapping grid according Pruner & Míka (1996).

Photodocumentation of localities of individual species can be found at <http://www.elateridae.com/galerie/search.php>. After typing a keyword = species name, for example "Anostirus bohemicus" into the browser, you can click on the "search" button and go through the page of photos. You can double-size each photograph by clicking on it. Photographs of the biotopes of the following species are available: *Anostirus bohemicus* sp. n. (58 photos), *A. colacurcioi* (7 photos), *A. gabilloti* (18 photos), *A. lauianus* (27 photos), *A. maccapanii* (30 photos), *A. marginatus* (29 photos), *A. platiai* sp. n. (10 photos), *A. sulphuripennis sulphuripennis* (26 photos), *A. reissi* (15 photos), and *A. zenii binaghianus* (40 photos).

Unless otherwise stated, the photographs were taken by the author.

***Anostirus bohemicus* sp. n.**

Figs. 1-3, 15, 41, 59.

ZooBank: <http://zoobank.org/46EF96BC-7B3B-447F-920C-7615665921DE>

The history of the determination. The first known record of *Anostirus bohemicus* sp. n. comes from Starý Herštejn hill (Czechia) near Vranov (25.iv.2004, 1 ♀). This female was determined (J. Mertlik det. 2005) as *A. sulphuripennis* and was published under this name together with a female *A. sulphuripennis*, that was found in the Šumava Mts. (Nakládal et al. 2007). Other records of *A. bohemicus* sp. n. from the Ohře valley near Loket and Karlovy Vary and from the Krušné hory Mts., have also been determined and published as *A. sulphuripennis* (Benedikt 2010, Mertlik 2015).

In 2019, my colleague P. Brůha received several males of *A. sulphuripennis* from Šumava Mts. and pointed out to me significant differences in the morphology between the Šumava Mts. specimens and the specimens from the Krušné hory Mts. According to body shape, antennal segments and aedeagus shape, the specimens found from Šumava Mts. and Novohradské hory Mts. belonged to the variation range of *A. sulphuripennis*, while the specimens from western and

northern Bohemia belonged to the species group *A. gabilloti* (Pic, 1907). From the beginning of 2022, I used the name *A. gabilloti* for these specimens (Mertlik 2007-2024). However, after obtaining photodocumentation of the type *A. pseudosulphuripennis* from the Basel Museum and studying other related species of the *A. gabilloti*-group from the Maritime Alps and the Apennine Peninsula, I found that this is a new, previously undescribed species.

Type locality. Czechia, Bohemia bor., Krušné hory Mts., Horní Jiřetín-Jezerí, Jezerka, Jezerí hill.

Type material. Holotype, male: CZ – BOHEMIA bor. (5446), HORNÍ JIŘETÍN, Jezerka [Jezerí hill, 707 m a.s.l., 50.5470750N, 13.4834064E], 20. IV. 2018, JOSEF MERTLIK LGT. Deposited in the collection of Josef Mertlik.

Paratypes (216 males, 33 females): Bohemia bor., Horní Jiřetín (5446), Jezerka, Jezerí hill, 625-707 m a.s.l., 17.v.2008, 1 ♀, beaten from branches, P. Krásenský leg. et coll., J. Mertlik det. 2008; 26.v.2008, 5 ♀♀, beaten from branches of flowering *Viburnum lantana*, J. Mertlik leg. et coll.; 30.v.2008, 1 ♀, beaten from branches of flowering shrubs, P. Krásenský leg., det. et coll.; 21.v.2009, 1 ♀, O. Odvárka leg., det. et coll.; 8.v.2009, 1 ♀, beaten from branches of *Viburnum lantana*, J. Mertlik leg. et coll., 9.v.2009, 2 ♀♀, beaten from branches, V. Dušánek leg. et coll.; 29.iv.2010, 5 ♂♂, in flight around the birches, P. Brůha leg., det. et coll.; 24.v.2010, 1 ♀, O. Odvárka leg., det. et coll.; 23.iv.2011, 5 ♂♂, in flight over debris field, V. Dušánek leg., det. et coll.; 12.v.2011, 1 ♀, O. Odvárka leg., det. et coll.; 28.iv.2012, 26 ♂♂, in flight over debris field, 1 ♀, beaten from branches of shrubs, J. Mertlik leg. et coll.; 30.iv.2012, 1 ♂, O. Odvárka leg., det. et coll.; 2.v.2012, 4 ♂♂, 1 ♀, O. Odvárka leg., det. et coll.; 10.v.2012, 1 ♂, O. Odvárka leg., det. et coll.; 15.v.2013, 2 ♂♂, 4 ♀♀, B. Zbužek leg., det. et coll.; 16.v.2013, 4 ♂♂, O. Odvárka leg., det. et coll.; 19.v.2013, 1 ♂, O. Odvárka leg., det. et coll.; 25.iv.2014, 11 ♂♂, O. Odvárka leg., det. et coll.; 30.iv.2014, 6 ♂♂, O. Odvárka leg., det. et coll.; 24.iv.2015, 4 ♂♂, in flight, J. Mertlik leg. et coll.; 22.iv.2018, 43 ♂♂, 1 ♀, V. Dušánek leg., det. et coll.; 20.iv.2018, 54 ♂♂, in flight over the top rocks (50.5470750N, 13.4834064E), J. Mertlik leg. et coll.; Bohemia bor., Horní Jiřetín (5447), Černice, Černický vrch hill, 535 m a.s.l. (50.5675631N, 13.5085906E), 10.v.2021, 6 ♂♂, in flight around the top of the rock massif Fortress Yucatan, J. Mertlik leg. et coll.; 14.v.2022, 1 ♀, beaten from branches, V. Dušánek leg. et coll.; Bohemia occ., Stráž nad Ohří (5644), Nebesa hill, 500 m a.s.l. (50.3465308N, 13.0455967E), 4.v.2015, 4 ♂♂, 1 ♀, beaten from branches, J. Mertlik leg. et coll.; Bohemia occ., Krásný Les (5644), Horní hrad, vi.2011, 1 ♀, P. Týr leg., V. Týr det., M. Putz coll.; Bohemia occ., Loket (5842), 16.iv.2013, 1 ♂, V. Kubík leg. et coll., J. Mertlik det. 2015; Bohemia occ., Loket env. (5842), Ohře valley, 22.iv.2007, 1 ♀, J. Pávek leg. et coll., V. Benedikt det. (Benedikt 2010 as *A. sulphuripennis*); Bohemia occ., Karlovy Vary (5842), Doubí, Ohře valley, 10.v.2008, 2 ♀♀, quercetum, beaten from the oak tree branches, S. Benedikt leg. et det., V. Benedikt coll. (Benedikt 2010 as *A. sulphuripennis*); debris forest (50.1966456N, 12.8243842E), 12.v.2008, 2 ♀♀, beaten from the oak tree branches, J. Mertlik leg., det. et coll. (Benedikt 2010 as *A. sulphuripennis*); Bohemia occ., Konstantinovy Lázně (6144), Gutštejn Castle area, 27.iv.2015, 2 ♂♂, V. Dongres leg., det. et coll.; Bohemia occ., Konstantinovy Lázně (6144), Šipín, valley of the Úterský brook, just before the confluence with the Hadovka brook, 3.v.2016, 1 ♀, on flowering thorns, V. Dongres leg., det. et coll.; Bohemia occ., Konstantinovy Lázně (6144), Šipín, valley of the Úterský brook, debris field (49.8553056N, 13.0335992), 25.iv.2015, 4 ♂♂, V. Dongres leg., det. et coll.; 2.v.2016, 5 ♂♂, J. Krošlák leg., det. et coll.; 3.v.2016, 2 ♂♂, M. Ouda leg., det. et coll.; dtto, 1 ♂, 1 ♀, V. Dongres leg., det. et coll.; 7.v.2016, 3 ♂♂, V. Dongres leg., det. et coll.; 1.v.2017, 4 ♂♂, V. Dongres leg., det. et coll.; 1.v.2017, 10 ♂♂, in flight or climbing out of moss on rocks, V. Týr leg. et det., M. Putz coll.; 22.iv.2018, 4 ♂♂, V. Dongres leg., det. et coll.; dtto, 4 ♂♂, J. Mertlik coll.; Bohemia occ., Cebiv (6144), Bezemín, Slovanské hradiště hill (49.8553414N, 13.0227208E), 12.v.2022, 1 ♀, beaten from branches, V. Dušánek leg. et coll.; Bohemia occ., Mnichov (6542), Vranov, Starý Herštejn hill, 878 m a.s.l. (49.4721869N, 12.7139869E), 25.vi.2004, 1 ♀, old deciduous forest in a massif with ruins of a castle, Z. Doležal leg. et coll., J. Mertlik det. 2005 (Nakládal et al. 2007 as *A. sulphuripennis*); 11.v.2022, 1 ♂, beaten from branches, J. Mertlik leg. et coll.; dtto, 1 ♂, 1 ♀, on grasslands, V. Dušánek leg. et coll.

Differential diagnosis. *Anostirus bohemicus* sp. n. belongs to the subgenus *Pseudostirus* Binaghi, 1940 by the shape of the body, the shape of the antennomeres, the shape of the elytral interstriae and the type of pubescence of the pronotum. Of this subgenus, 9 species are known from the Alpine region, the Apennines and the French Massif Central: *Anostirus colacurcioi*, *A. gabilloti*, *A. gudenzii*, *A. lauianus*, *A. maccapanii*, *A. marginatus*, *A. sulphuripennis*, *A. reissi* and *A. zenii*.

But *Anostirus bohemicus* sp. n. differs from the above species by its larger size and the shape of the aedeagus, which is strongly curved, its parameres are long and narrow and are markedly narrowed at the inner margin in its apical part (from the dorsal view), and also by the shape of the seventh sternite, which is evenly tapered from base to apex and its sides are straight. Therefore, by the shape of its aedeagus belongs to the subgenus *Ipostirus* Binaghi, 1940, similar to a related species *A. pseudosulphuripennis* (see Binaghi 1940: 216).

In size and shape of the aedeagus is *Anostirus bohemicus* sp. n. related to *A. pseudosulphuripennis*, their aedeagus are almost equal in length (2.5-2.6 mm) and its parameres narrowing before the apex. Their aedeagus differs in the type of narrowing of the parameres in their apical part. The parameres of *A. bohemicus* sp. n. are markedly narrowed 0.32 mm before their apex (this is clearly visible in ventral view), whereas those of *A. pseudosulphuripennis* are gradually narrowed towards the apex from the middle of their length. Otherwise, *A. bohemicus* sp. n. is also distinguished from *A. pseudosulphuripennis* by the denser punctuation of the pronotum surface, and its seventh sternite (seventh abdominal sternite) has straight margins from base to apex. *Anostirus pseudosulphuripennis* has sparse punctuation of the pronotum surface (distance between punctures is 2-3 of their diameter), its seventh sternite has rounded lateral margins.

Fig. 1. *Anostirus bohemicus* sp. n., ♂.Fig. 2. *Anostirus bohemicus* sp. n., ♀.

Etymology. The specific name is derived from the name of the historical land of Czechia – Bohemia, where all known localities of the new species are situated.

Description. Male (Fig. 1). Shiny, bicoloured, all black, only the elytra yellow-orange, darkened at the apex, legs dark brown, claws lighter. Pubescence on head and pronotum simple, long and erected, grey-black, pubescence on elytra rusty, black at apex, semi-erected.

Head with frons flat, moderately impressed before the anterior margin, this not developed in the middle and is joined with the clypeus; punctuation coarse with umbilicate punctures, with variable intervals, adjacent at the base and sides, in front with larger shiny areas without punctures.

Antennae exceeding apices of posterior angles of pronotum by 2.5 antennomeres; first antennomere twice as long as wide, second antennomere very small, almost globous, 1.2 times as long as wide, third to tenth antennomeres pectinate, lamella of third antennomere 0.43 times shorter than antennomere, lamella of fourth antennomere 0.71 times shorter than antennomere, lamella of fifth antennomere 1.14 times longer than antennomere; the lamellae of the sixth to ninth articles are 1.43 times longer than the articles; the tenth article is 1.2 times longer than the ninth article; the lamella of the tenth article is 0.83 times shorter than the article; the last article is simple, 1.56 times longer than the previous article, 3.5 times longer than wide, with sides gradually widened from base to apex, pointed at the end.

Pronotum 1.06 times longer than wide, widest at the apices of posterior angles, regularly convexed, sides regularly arcuated, strongly sinuated before the posterior angles; posterior angles strongly divergent, acuminated, with short weak keels; lateral margins complete and visible in a dorsal view for all their length; the punctuation of the pronotum is deep, double in size, the distance between the single punctures is 1-3 times the diameter of the punctures, the larger punctures are up to twice the size of the small punctures, they are partially embossed, unevenly scattered with small punctures (Fig. 41).

Propleuron shallowly punctate, wrinkled, matte, prosternum shiny, very sparsely punctate, prosternal collar wrinkled dull feebly bent downwards, its anterior edge situated distinctly higher than anterior angles of propleuron. Prosternal process weakly bent dorsal behind anterior coxae.

Scutellum shield-shaped, 1.34 times longer than wide, subsinuate at sides, rounded at the apex, slightly impressed in the middle, very finely punctured.

Elytra 2.7 times longer than pronotum and 1.26 times wider than pronotum; 2.25 times longer than wide, widest in middle, convex, almost vertically inclined laterally from sixth interstria, last interstria forming an edge with lateral margins and visible along its entire length in dorsal view; striae regularly marked and finely punctated, interstriae flat with very fine punctuation.

Seventh sternite is regularly tapered from base to apex, its sides are straight (Fig. 59).

Legs long, tibiae and tarsomeres with stout setae, tarsomeres decreasing in length from tarsomere I to IV, simple.

Aedeagus (Fig. 3), length 2.6 mm, parameres markedly narrowed 0.32 mm before their apex (this is clearly visible in ventral view).

Size. Length 11.5 mm, width 3.4 mm.

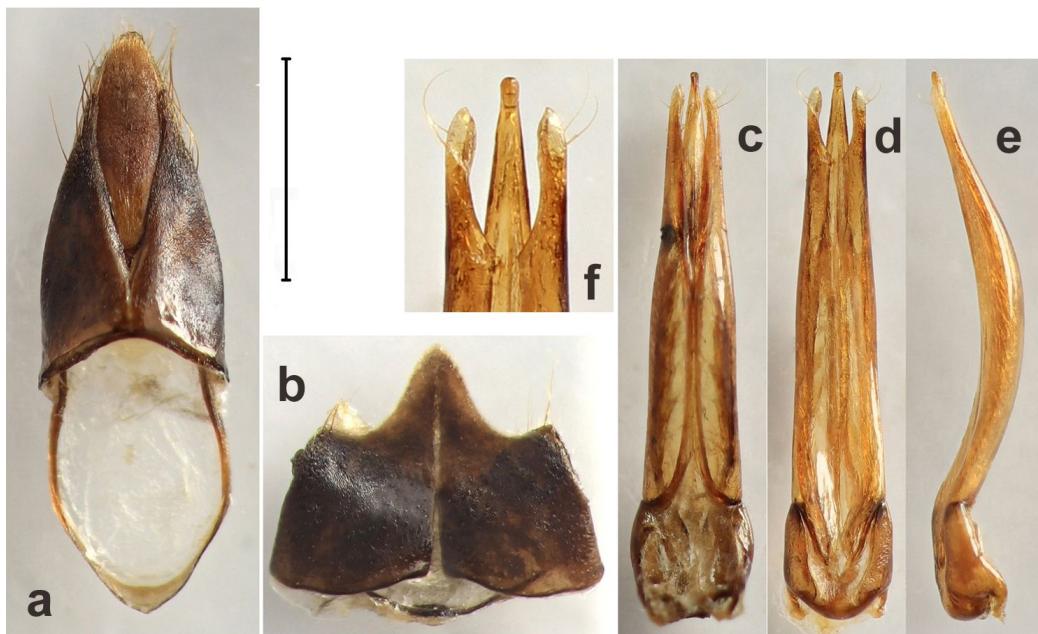


Fig. 3. *Anostirus bohemicus* sp. n., a - sternite IX and X, b - tergite VIII, c-f – aedeagus, c – dorsal view, d – ventral view, e – lateral view, f – detail of apex from ventral view. Scale = 1 mm

Female. Very different from males by larger body, shape of pronotum and length of antennae (Fig. 2). Antennae with feebly serrated articles exceeding apices of posterior angles of pronotum by 1 antennomeres; pronotum widest in middle and also on apices of posterior angles, with smaller punctuation. The elytra are 2.64 times longer than the pronotum and 1.26 times wider than the pronotum, 2.05 times longer than wide, its sides broadened beyond the middle of their length.

Size. Length 12.0 mm; width 3.8 mm.

Variability. Body length of males 9.8-12.0 mm, width 2.9-3.5 mm; body length of females 10.8-12.5 mm, width 3.5-4.3 mm.

Larva unknown.

Collection circumstances. Males fly in late April and early May over debris fields and around the tops of dominant rocks, sometimes perching on vegetation. Females occur later in May and seek out flowering shrubs, such as *Viburnum lantana* or trees, such as oaks.

For access to detailed photodocumentation of the biotope, see the instructions in the Material and Methods section.

Anostirus pseudosulphuripennis Binaghi, 1940

Body length of male 9.8 mm, width 3.1 mm (Figs. 4-8).

Known from France (Massif Central, Lozère, Col de Jalacreste). It belongs to a group of species with shorter lamellae on the antennomeres, similar to *A. gabilloti*. It has sharp posterior pronotal angles, similar to *A. reissi*. The male was known only from the original description, but I was able to obtain photographs of the holotype, deposited in the Natural History Museum Basel.

Material studied: Holotype, male, „Florac Lozère, MAI 1914_L.PUEL, Col de Jalareste, Sammlung L. Puel, Sammlung Georg Frey“, in collection Natural History Museum Basel.



Fig. 4.



Fig. 5.



Fig. 6.



Fig. 7.

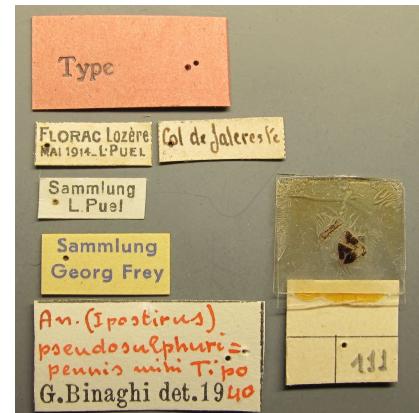


Fig. 8.

Fig. 4-8. *Anostirus pseudosulphuripennis*, holotype, ♂, length 9.8 mm. 4 – body, dorsal view, 5 – body, ventral view, 6 – aedeagus (length 2.5 mm), tergite VIII, IX and X, sternite IX and X, 7 – aedeagus (Binaghi 1940), 8 – type labels.

Note. There are very different drawings of the aedeagus in the publications (Binaghi 1940: 225 and Leseigneur 1972: 265). The photograph of the aedeagus of the holotype is not of very good quality (Fig. 6), but its shape and proportions agree with Binaghi's drawing - not Leseigneur's. The body drawing of the male *A. pseudosulphuripennis* (Leseigneur 1972: 274) shows a greater length of antennae, a narrower pronotum, and wider elytra than in the Holotype.

Peslier (2014) reports finding one female of *Anostirus pseudosulphuripennis* in the eastern Pyrenees. But this female has a denser pronotal punctuation than the holotype of *A. pseudosulphuripennis* and is similar to one female, which is known for me from western Pyrenees (Fig. 10). To solve this problem, it is necessary to find a male.



Fig. 9. *Anostirus* sp., ♀, France, Massif Central.



Fig. 10. *Anostirus* sp., ♀, France, W Pyrenees.

Anostirus sp.

Body length of female 12.0 mm, width 3.8 mm (Fig. 9).

There are legitimate doubts about the correct determination of the females of *A. pseudosulphuripennis* that have been found in the northern part of the Massif Central (Leseigneur 1972 and 2014). There is one female in my collection from the locality of Mont-Dore (Auvergne). Indeed, the holotype of *A. pseudosulphuripennis* has a simple and very sparse pronotal punctuation (the distance between the punctures is 3-6 of their diameter), but the female from Monts Dore (fig. X) has a dense and doubly large pronotal punctuation. According to this punctuation this female is related to *A. bohemicus* sp. n., but differs from it by the rounded sides of the seventh sternite. I believe that in the case of females of the genus *Anostirus* found in the northern part of the Central Massif, this is a new, previously undescribed species. To solve this problem, it is necessary to find the male.

Material studied: France, Auvergne, le Mont-Dore, Grande Cascade, 13.vi.1999, 1 ♀, A. Hamet leg., J. Mertlik coll.

Anostirus sp.

Body length of female 12.0 mm, width 3.8 mm (Fig. 10).

The record of *Anostirus sulphuripennis* (1 ♀) has also been published from the French part of the Pyrenees (Tiberghien 1968, Leseigneur 1972). In my collection I have a female found near the reported locality (Lac du Rabiet), but it differs significantly from the alpine specimens of *A. sulphuripennis* in the shape of the pronotum, its denser punctuation and silvery pubescence. I think that in the case of the click-beetles from Lac du Rabiet and Gavarnie this is a new species not yet described. To solve this problem, it is necessary to find the male, as Leseigneur (1972) has already written.

Material studied: France, Pyrenees, Gavarnie env., 29.vi.1976, 1 ♀, M. Zeising leg., J. Mertlik coll.



Fig. 11. *Anostirus sulphuripennis sulphuripennis*, ♂,
Switzerland.



Fig. 12. *Anostirus sulphuripennis sulphuripennis*, ♀,
Italy.



Fig. 13. *Anostirus sulphuripennis sulphuripennis*, ♂,
Czechia.



Fig. 14. *Anostirus sulphuripennis sulphuripennis*, ♀,
Czechia.

Anostirus sulphuripennis sulphuripennis (Germar, 1843)

Body length of male 10.0-12.5 mm, width 2.8-3.5 mm; female 11.0-13.0 mm, 3.3-4.0 mm (Figs. 11-15, 45-46, 60-61, 69-90).

A nominate subspecies of *Anostirus sulphuripennis* is known from the Alps from northwestern Italy, Switzerland, France, Austria, Romania and also from Czechia from the Šumava Mts. and Novohradské hory Mts. Its individual record is also from Greece (Platia & Kakiopoulos 2014).

According to Binaghi (1940: 217, Fig. 60), the nominate subspecies has eyes of normal size, the drawing of the shape of the aedeagus (Binaghi 1940: 229, Fig. 86) is practically identical to Leseigneur (1972: 265, Fig. 267). Its alpine records are very rare, with only one pair from this area in my collection.

Material studied: Switzerland, Lower Engadin, Tarasp, Mid-June 1905, 1 ♂, collector unknown, J. Mertlik coll.; Italy, Biella – VC, Piedicavallo, 1040 m a.s.l., 28.vi.1979, 1 ♀, S. Riese leg. et det., J. Mertlik coll.; Czechia, Bohemia occ., Šumava Mts., Železná Ruda (6845), Alžbětín, stone seas in the valley of Svarožná river, 910 m a.s.l., 26.v.2023, 3 ♂♂, beaten from branches, J. Mertlik leg. et coll.; Bohemia occ., Šumava Mts., Kašperské hory (6847), Červená, Šafářův vršek, 12.vi.2011, 1 ♂, P. Vonička leg. et coll., B. Zbuzeck det.; Bohemia occ., Šumava Mts., Kašperské hory (6847), Červená, Šafářův vršek, southern debris field, 800 m a.s.l., 7.v.2011, 7 ex., P. Moravec leg., det. et coll.; 11.v.2022, 9 ♂♂, beaten of spruce and pine branches, J. Mertlik leg. et coll.; Bohemia mer., Šumava Mts., Nicov (6847), Popelná, Obří hrad Mt., 875-975 m a.s.l., 7.v.2011, more ex., beaten of fir, pine and rowan branches, P. Moravec leg., det. et coll.; 11.v.2022, 68 ♂♂, 5 ♀, beaten of spruce and pine branches, J. Mertlik leg. et coll.; dtto, 75 ♂♂, 3 ♀♀, V. Dušánek leg. et coll.; 31.v.2023, 6 ♂♂, 16 ♀♀, beaten from branches, J. Mertlik leg. et coll.; Bohemia mer., Šumava Mts., Kvilda env. (7047), Bučina, without other data [Buchwald im Bayer. – Böhmer Wald] (Hennevogl 1905, Jagemann 1940, Horion 1953); Bohemia mer., Šumava Mts., Boubín Mt. (7048), 1250-1362 m a.s.l., 17.viii.2004, 1 ♀, in flight in a closed forest habitat, O. Nakládal et J. Farkač leg., O. Nakládal coll., J. Mertlik det. 2005 (Nakládal et al. 2007); Bohemia mer., Blanský les (7151), vi.1992, 1 ♀, Černý leg., Z. Kletečka coll., J. Mertlik det. 2007; Bohemia mer., Novohradské hory Mts., Hojná Voda Nature Reserve (7254), 25.v.2009, 2 ♂♂, Š. Vodka leg. et coll., J. Mertlik det. 2010.

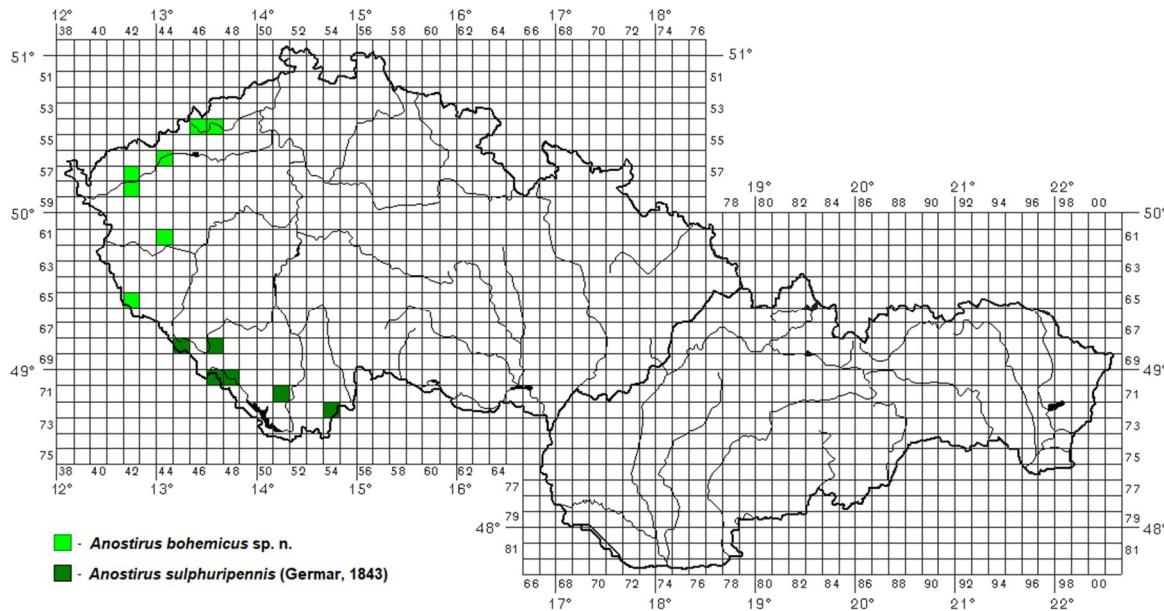


Fig. 15. Faunistic map of the Czechia and Slovakia. Occurrence of *Anostirus bohemicus* sp. n. and *A. sulphuripennis sulphuripennis*.

Anostirus sulphuripennis penninus Binaghi, 1940

Body length of male 8.7-12.0 mm, width 2.8-3.0 mm; female, 12.2 mm, 3.5 mm (Figs. 16-17, 47, 71).

By Binaghi (1940) known only from northwestern Italy (Piedmont: Oropa and Gressoney). Compared to the nominate subspecies it has conspicuously convexed eyes, a narrower body, and especially a narrow pronotum. The aedeagus is slender and longer, length 1.90 mm (Fig. 71).

Material studied. Italy, Piemonte, Biella, Oropa env., 1440 m a.s.l., 26.v.1999, 5 ♂♂, in flight around the willow, 1 larva, under stone, J. Mertlik leg. et coll.; Italy, Oropa, 27.v.2000, 1 ♀, V. Dušánek leg., J. Mertlik coll. 1 larva, under stone, J. Mertlik leg. et coll.; Italy, Oropa, 27.v.2000, 1 ♀, V. Dušánek leg., J. Mertlik coll.; dtto, 24 ♂♂, 2 ♀♀, V. Dušánek leg. et coll.; dtto, 15.v.2000, 40 ♂♂, V. Dušánek leg. et coll.



Fig. 16. *Anostirus sulphuripennis penninus*, ♂,
Italy, Oropa.



Fig. 17. *Anostirus sulphuripennis penninus*, ♀,
Italy, Oropa.



Fig. 18. *Anostirus lauianus*, ♂,
Slovenia, Čaven.

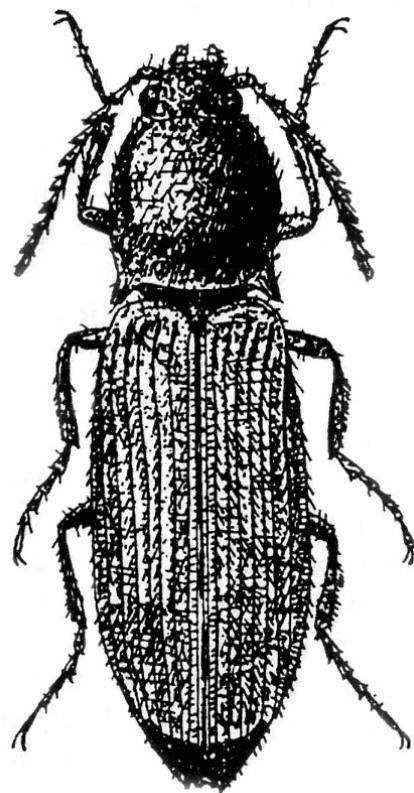


Fig. 19. *Anostirus lauianus*, ♀,
Austria (original drawing by Wurst 1994).

Anostirus lauianus Wurst, 1994

Body length of male 10.7-11.6 mm, width 3.0-3.2 mm; female: 11.5 mm, 3.6 mm (Figs. 18-19, 49, 57b, 62, 72).

Described from a single female found in the mountains on the Austrian-Slovenian border (Karawanken, Bärenthal). This female has an expanded pronotum in the middle and moderately dense punctuation of the pronotum (Wurst 1994: 263). The author gives as one of its main distinguishing characters from *A. sulphuripennis* and *A. reissi* a small excavation on the apex of the seventh sternite (Fig. 57b). However, this excavation is, in my opinion, only a rare form of monstrosity, which is also known in other species of click beetles (Fig. 57a).

Binaghi (1940: 217, figs. 61, 87 and 229) reports a record from the Julian Alps (without further details) of a male *A. sulphuripennis*, which has the pronotum enlarged anteriorly and has a larger head and eyes. I have seven males from Slovenia which correspond to this form in all the above characters. Aedeagus in the Fig. 72.

I was unable to borrow the holotype of *Anostirus lauianus* (Fig. 19). But according to the original drawing, this female also has an enlarged pronotum in the anterior part, which is similarly punctate as in the above mentioned males from Slovenia. The male from Čaven mountain ridge is separated from the type locality of *A. lauianus* by a distance of 60 km. On the basis of the above, it is therefore very likely that the males found in Slovenia belong to *A. lauianus*.

Material studied: Slovenia bor., Maribor-Ruše, Pohorje Mts., 5.-7.vi.2013, 1 ♂, Z. Minařík leg., J. Bednář coll., J. Mertlik det. 2018; Slovenia occ., Trnovski gozd, Lokavec env., Koča na Čavnu, 1030 m a.s.l. (45.9231742N, 13.8590231E), 15.-16.v.2017, 2 ♂♂, active on rocks on stones, J. Mertlik leg., coll. et det. 2023; dtto, 4 ♂♂, V. Dušánek leg. et coll.; [Ajdovščina, Dobravlje, Stomaž], 26.-28.v.2023, 2 ♂♂, F. Pavel leg. et coll., J. Mertlik det. 2023.

Anostirus zenii zenii (Rosenhauer, 1856)

Body length 9.5-13.0 mm, 3.0-4.0 mm (Fig. 20).

Known from the Italy (Friuli V. Giulia, Trentino A. Adige, Veneto) and Austria (Styria). It is distinguished from other species of this group by the red colouration of the elytra and the short ribbed third interstriae at the base of the trunks.

Material studied: Italy, Friuli (PN), forest Prescudin, 7.vii.1984, 1 ♀, F. Sandel leg., G. Platia det. 2002, J. Mertlik coll.



Fig. 20. *Anostirus zenii zenii*, ♀, Italy.

Anostirus zenii binaghianus Wurst, 1995

Body length of male 9.6-12.0 mm, width 2.9-3.6 mm; female 11.6 mm, 3.6 mm (Fig. 21-22, 51).

Described from Slovenia, which, in contrast to the nominate subspecies, has monochromatic elytra without a black apex. I am aware of several new records of *A. zenii binaghianus* from the vicinity of Ajdovščina (Čaven mountain ridge).

Note. Wurst (1995) reports an aedeagus length of 1.06 mm, but its length in the new material is 1.80-1.90 mm.

Material studied: Slovenia [VL08], Čaven, 1100 m a.s.l., 2.v.2009, 1 ♂, J. Broder leg., J. Mertlik coll.; Slovenia occ., Trnovski gozd, Lokavec env., Koča na Čavnu, 1030 m a.s.l. (45.9231742N, 13.8590231E), 15.-16.v.2017, 2 ♂♂, active on rocks on stones, J. Mertlik leg. et coll.; dtto, 3 ♂♂, V. Dušánek leg. et coll.; dtto, 21.v.2023, 5 ♂♂, J. Mertlik leg. et coll.; dtto, 21.v.2023, 2 ♂♂, V. Dušánek leg. et coll.; dtto, 22.v.2023, 6 ♂♂ (1 ♂, sitting on the wall at Koča Antona Bavčerja na Čavnu, 45.9289636N, 13.8533144E); [Ajdovščina, Dobravlje, Stomaž], 26.-28.v.2023, 2 ♂♂, 1 ♀, F. Pavel leg. et coll., J. Mertlik det. 2023.



Fig. 21. *Anostirus zenii binaghianus*, ♀,
Slovenia, Čaven.



Fig. 22. *Anostirus zenii binaghianus*, ♀,
Slovenia, Čaven.

Anostirus gabilloti (Pic, 1907)

Body length of male 8.0-10.0 mm, width 2.2-2.8 mm, female 10.5-12.0 mm (Fig. 23-26, 48, 58, 74).

Described as a smaller and more stocky form of *A. sulphuripennis* (the shape of elytra of lectotype in Platia 1994: 51). It is known from the French-Italian border (Alpes-Maritimes and Alpes-Cottieries). It differs from the previous species of subgenus *Pseudostirus* by the shorter lamellae on the antennomeres. It produces two colour forms, the nominate form having the elytra monochromatic, the other form having the elytra blackened at the apex.

Note. There are different drawings of aedeagus in the publications (Binaghi 1940: 229, Figs. 90-91; Leseigneur 1972: 267; Fig. 269; Platia 1994: 54, Fig. E). The shape of the aedeagus specimens from my study material (Fig. 74), corresponds in shape to the drawing of Binaghi 1940: 229, Fig. 91). Also interesting is the variation in body shape, which occurs mainly in smaller specimens (Figs. 24, 26). This variability is also known to me in other related species (Figs. 32-33, 39).

Material studied: Italia, Alpi Maritime Mts., Terme di Valdieri (44.2186075N, 7.3039831E), 18.-19.vi.1990, 1 ♀, beaten of bush branches, J. Mertlik leg. et coll., G. Platia det. 1990; France, Alpes Maritimes, Col des Granges, 2505 m a.s.l., 23.vi.1999, 1 ♂, under stone, J. Mertlik leg. et coll.; France, Alpes Maritimes, Saint-Dalmas-le-Selvage, Col de Raspailion, Cime de Vermillon, 2579 m a.s.l., 19.vi.2023, 24 ♂♂, active on rocks in the debris fields, J. Mertlik leg. et coll.; dtto, 24 ♂♂, V. Dušánek leg. et coll.; Italia, Cuneo, Bagnolo Montoso, 1300 m a.s.l., 26.vi.1982, 1 ♀, R. Mourglia leg., S. Riesse det., V. Dušánek coll.



Fig. 23. *Anostirus gabilloti*, ♂,
France, Cime de Vermillon.



Fig. 24. *Anostirus gabilloti*, ♂,
France, Cime de Vermillon.



Fig. 25. *Anostirus gabilloti*, ♀,
Italy, Terme di Valdieri.



Fig. 26. *Anostirus gabilloti*, ♀,
Italy, Bagnolo Montoso.



Fig. 27. *Anostirus reissi*, ♂,
Italy, Plose.



Fig. 28. *Anostirus reissi*, ♀,
Italy, Plose.

Anostirus reissi (Reitter, 1913)

Body length of male 8.2-10.6 mm, width 2.3-3.0 mm; female: 10.0-10.4 mm, 2.9-3.0 mm (Figs. 27-28, 50, 63, 73).

Known from the Italian Dolomites, west of which it was found at Vernago and Tubre. It has only slightly shorter lamellae on the antennal segments than *A. sulphuripennis*, the punctuation of the pronotum is sparse, like that of *A. sulphuripennis penninus*, and it has sharp points on the posterior angles of the pronotum, like that of *A. pseudosulphuripennis*. In females, the punctuation of the pronotum may be denser than in males, which may lead to erroneous determinations.

Material studied: Alto Adige, Plose, 2200 m a.s.l., 1.vii.1995, 1♂, Schwienbacher leg., G. Platia det. 1995, J. Mertlik coll.; Italy, Trentino, Bressanone, Plose Mt., 2200 m a.s.l., 28.v.1999, 1 larva, under stone, J. Mertlik leg. et coll.; Italy, Trentino, Bressanone, Plose Mts., Schönboden Mt., 2300 m a.s.l., 13.vi.2003, 27♀♀, 3♀♀, in flight around the top of the mountain and on grassland, J. Mertlik leg. et coll.; dtto, 5♂♂, 3♀♀, V. Dušánek leg. et coll.; Italy, Trentino-Alto Adige, Brixen, Kreuztal – Val Croce, Plose, Schönboden Mt. (Giono Bello), 2290 m a.s.l., 21.vi.2023, 1♂, on the grass, J. Mertlik leg. et coll.; dtto, 3♂♂, 5♀♀, V. Dušánek leg. et coll.; Italia, Ötztaler Alpen, Madonna env., 2450 m a.s.l. (46.7480261N, 10.8304061E), 24.-25.vi.1990, 2♂♂, at flight, J. Mertlik leg. et coll., G. Platia det. 1990 as *A. gabilloti*.

The last five species are endemic to the four mountain ranges of the Apennine Peninsula (Italy).

Anostirus colacurcioi Platia & Pedroni, 2009

Body length of male 9.0 mm, width 2.68 mm; female 11-11.3 mm, 3.5-3.6 mm (Figs. 29-30, 55, 65, 78).

Known from Emilia-Romagna, Appennino Tosco Emiliano, Rifugio Cavone, 1600 m a.s.l.

Material studied: Italy, Emilia-Romagna, Bologna, Corno alle Scale, 1800 m a.s.l., 27.V.2017, 1♂, L. Colacurcio leg., J. Mertlik coll.



Fig. 29. *Anostirus colacurcioi*, ♂,
Italy, Corno alle Scale.



Fig. 30. *Anostirus colacurcioi*, ♀, Italy.
Photo from original description.

Anostirus maccapanii Platia, 2017

Body length of male 9.5-10.1 mm, width 2.2-3.0 mm; female, 10.6-11.8 mm, 3.55-3.80 mm (Figs. 31-33, 54, 77).

Known from Appennino Tosco Emiliano, Lago Baccio, 1554 m a.s.l. (Platia 2017) and Appennino Tosco Emiliano, Lago Scaffaiolo, 1775 m a.s.l. (Platia et al. 2020).

Note. Interestingly, the locality from which *A. maccapanii* females have been described (Lago Scaffaiolo), is only 1800 m from the type locality of *A. colacurcioi* (the type localities of both species are 18 km apart).

New material from 2023 from the type locality of *A. maccapanii* (Lago Baccio) is differs from the type by shorter posterior pronotal angles (Figs. 32-33). But this variability is not rare among species of the genus *Anostirus*. Aedeagus of a newly found male *A. maccapanii* (Fig. X), agreeing in basic shape of penis and parameres with type. Unfortunately, a complete comparison of aedeagus shapes cannot be made because the aedeagus in the type is damaged, i.e., it lacks the apex of the penis and the apices of the parameres (Platia 2017: 60). The aedeagus is identical to that of *A. colacurcioi* (Platia & Pedroni 2009: 140).

Material studied: Italy, Emilia-Romagna, Pievepelago, Lago Baccio env., 1640-1700 m a.s.l. (44.1266611N, 10.5858172E), 17.vi.2023, 1 ♂, 13 ♀♀, beaten of branches of shrubs and trees in debris fields, J. Mertlik leg. et coll.; dtto, 3 ♀♀, V. Dušánek leg. et coll.

Anostirus gudenzii Platia, 1983

Body length 9.5-13.0 mm, width 2.6-4.3 mm (Fig. 34, 56, 64, 75).

Known from Abruzzo: Gran Sasso, border Abruzzo-Lazio: Mt. Gorzano, Marche: Sibillini Mts.

Material studied: Italy, Monti della Laga, Rifugio Gorzano, 5.v.1983, 1 ♂, G. Platia leg. et det., J. Mertlik coll.



Fig. 31. *Anostirus gudenzii*, ♂, Italy.
Photo from original description.



Fig. 32. *Anostirus maccapanii*, ♂, Italy.
Specimen with shortened apical angles of pronotum.



Fig. 33. *Anostirus maccapanii*, ♀, Italy.



Fig. 34. *Anostirus gudenzii*, ♂, Italy.



Fig. 35. *Anostirus marginatus*, ♂, Italy.



Fig. 36. *Anostirus marginatus* var., ♂, Italy.
Colour variation of elytra.



Fig. 37. *Anostirus marginatus*, ♀, Italy.

***Anostirus marginatus* Pic, 1931**

Body length 8.5-11 mm, width 2.7-3.8 mm (Figs. 35-37, 52, 66, 75).

Known from Alpi Apuane.

Material studied: Italy, Massa env., Alpi Apuane, Monte Tambura, 13.vi.2005, 7♂♂, F. Houška leg., J. Mertlik coll.; dtto, 1♂, V. Dušánek coll.; Italy, Toscana, Vagli Sotto, Monte Tambura, 1750-1860 m a.s.l., 18.vi.2023, 63♂♂, active on rocks in the debris fields below the top of the mountain, J. Mertlik leg. et coll.; dtto, 62♂♂, V. Dušánek leg. et coll.; Italy, Toscana, Vagli Sotto, Passo della Tambura, 1622 m a.s.l., 18.vi.2023 1♀, on the grass by the trail, V. Dušánek leg. et coll., J. Mertlik det.

***Anostirus platiae* sp. n.**

Figs. 38-40, 53, 67.

ZooBank: <http://zoobank.org/7357F33A-F308-415F-ADCB-921540925F5B>

Type locality. Italy, Toscana, Vagli Sotto, Alpi Apuane, Monte Tambura, 1750-1860 m a.s.l.

Type material. Holotype, male: ITALY – TOSCANA, Vagli Sotto, Monte Tambura, 18.6.2023, JOSEF MERTLIK LGT. Deposited in the collection of Josef Mertlik.

Paratypes (7 males). Italy, Toscana, Vagli Sotto, Monte Tambura, 1750-1860 m a.s.l., 18.vi.2023, 2♂♂, J. Mertlik leg. et coll.; dtto, 5♂♂, V. Dušánek leg. et coll.

Diagnosis. *Anostirus platiae* sp. n. belongs to the species of the subgenus *Pseudostirus* by the shape of the body, the shape of the antennal segments, the shape of the elytral interstriae and the type of pubescence of the pronotum. According to the shape of the body and the shape of the antennomeres, *Anostirus platiae* sp. n. belongs to the *A. gabilloti* group (*A. colacurcioi*, *A. gabilloti*, *A. gudenzii*, *A. maccapanii* and *A. marginatus*).

Anostirus platiae sp. n. is related to *A. gabilloti* and *A. marginatus*, according to the shape of the seventh sternite, which has strongly rounded lateral margins from base to apex (Figs. 58, 66-67), *A. colacurcioi* and *A. maccapanii* have a deep impression along the lateral margins (Fig. 64), *A. gudenzii* have seventh sternite more elongated (Fig. 65). The last three species have a very different type of aedeagus.

Anostirus platiae sp. n. is differs from the *A gabilloti* by its more slender body, very sparse punctation of the pronotum and long yellow pubescence of the body surface; from *A. marginatus* is differs by the yellow colouration of the elytra with blackened apex, very sparse punctation of the pronotum, larger dots in elytral interstriae and the shape of the parameres of the aedeagus. In size and shape of the aedeagus, is *A. platiae* most closely related to *A. gabilloti*.

Etymology. The specific name is a patronym in honour of Giuseppe Platia, Gatteo, Italy.

Description. Male (Fig. 38). Shiny, bicoloured, all black, only the elytra yellow-orange, darkened at the apex, legs dark brown, tarsomeres and claws lighter. Pubescence on head and pronotum simple, long and semi-erected, on the margins erected, yellow, pubescence on elytra yellow, semi-erected.

Head with frons flat, moderately impressed before the anterior margin, this not developed in the middle and is joined with the clypeus; punctuation coarse with umbilicate punctures, with variable intervals.

Antennae exceeding apices of posterior angles of pronotum by 2.75 antennomeres; first antennomere twice as long as wide, second antennomere very small, globous, as long as wide, third to tenth antennomeres pectinate, lamella of third antennomere 0.5 times shorter than antennomere, lamella of fourth antennomere of the same length as antennomere, lamella of fifth antennomere 1.01 times longer than antennomere; the lamellae of the sixth to ninth articles are 1.18 times longer than the articles; the tenth article is 1.08 times longer than the ninth article; the lamella of the tenth article is 0.85 times shorter than the article; the last article is simple, 1.69 times longer than the previous article, 5.5 times longer than wide, with sides gradually enlarged from the base to the apex, this subtruncate.

Pronotum 1.09 times longer than wide, widest at the apices of posterior angles, regularly convex, sides regularly arcuate, strongly sinuate before the posterior angles; posterior angles, strongly divergent, acuminate; lateral margins complete and visible in a dorsal view for all their length; punctures of pronotum small, simple, distance between punctures 3-6 times as large as puncture diameter (Fig. 53).

Propleuron densely punctate, shiny, prosternal collar feebly bent downwards, its anterior edge situated distinctly higher than anterior angles of propleuron. Prosternal process weakly bent dorsal behind anterior coxae.

Scutellum shield-shaped, 1.3 times longer than wide, subsinuate at sides, rounded at the apex, slightly impressed at the middle, very finely punctured.

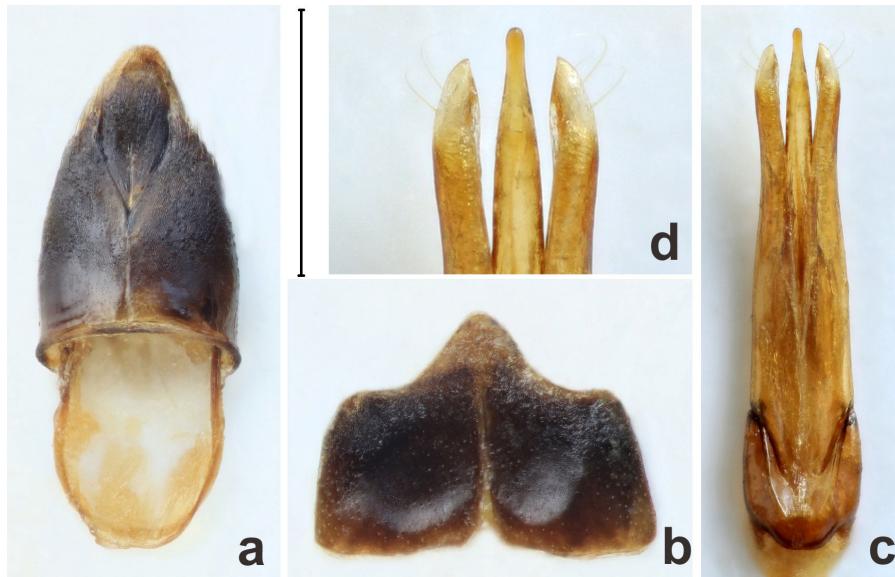
Elytra 2.74 times longer than pronotum and 1.2 times wider than pronotum; 2.5 times longer than wide, widest in middle, convex, almost vertically inclined laterally from sixth interstria, last interstria forming an edge with lateral margins and visible along its entire length in dorsal view; striae regularly marked with larger punctures, interstriae flat with distinctive punctuation between $\frac{1}{2}$ and $\frac{1}{3}$ of the size of the punctures in the striae.

Seventh sternite has strongly rounded lateral margins from base to apex (Fig. 67).

Legs long, tibiae and tarsomeres with stout setae, tarsomeres decreasing in length from tarsomere I to IV, simple.

Aedeagus (Fig. 40), length 1.8 mm.

Size. Length 10.5 mm, width 2.8 mm.

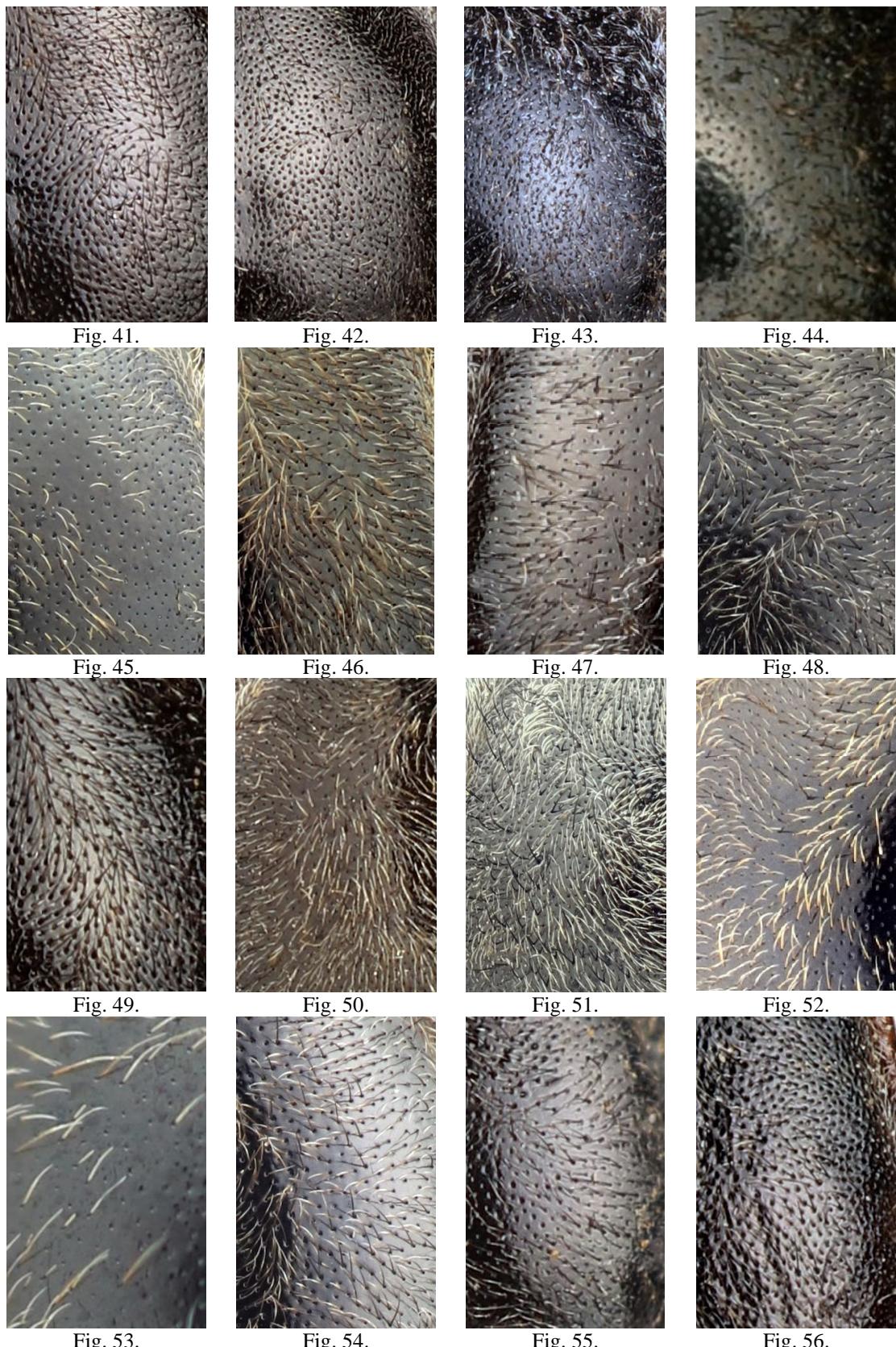
Fig. 38. *Anostirus platiai* sp. n., ♂. Size 10.5 mm.Fig. 39. *Anostirus platiai* sp. n., ♂. Size 8.7 mm.Fig. 40. *Anostirus platiai* sp. n., a - sternite IX and X, b - tergite VIII, c – aedeagus, ventral view, d – detail of apex from ventral view. Scale = 1 mm.**Female unknown.**

Variability. Body length of males 8,7-10.5 mm. Some males are small and have weakly developed posterior angles of the pronotum (Fig. 39).

Larva unknown.

Collection circumstances. The males flew in the sunshine over the debris field below the main peak Monte Tambura and over the adjacent rocky ridge, and they perched on the stones, together with males *Anostirus marginatus*.

For access to detailed photodocumentation of the biotope, see the instructions in the Material and Methods section.



Figs. 41-56. Punctuation on pronotal disc. 41 – *Anostirus bohemicus* sp. n., 42 – *Anostirus* sp. from northern part of the Massif Central, 43 – *Anostirus* sp. from the western Pyrenees, 44 – *A. pseudosulphuripennis*, 45 – *A. sulphuripennis* (Schwitzerland), 46 – *A. sulphuripennis* (Czechia), 47 – *A. sulphuripennis penninus*, 48 – *A. gabilloti* (France), 49 – *A. lauianus* (Slovenia), 50 – *A. reissi*, 51 – *A. zenii binaghianus*, 52 – *A. marginatus*, 53 – *A. platiai* sp. n., 54 – *A. maccapanii*, 55 – *A. colacurcioi* and 56 – *A. gudenzii*.



Fig. 57a-b.



Fig. 58.



Fig. 59.



Fig. 60.



Fig. 61.



Fig. 62.

Fig. 57. Abdominal segments of females, monstrosity of the seventh sternite, 57a – *Anostirus purpureus*, ♀, 57b – *A. lauianus*, ♀ (original drawing by Wurst 1994). Fig. 58-62. Abdominal segments of males, 58. – *A. gabilloti*, 59 – *A. bohemicus* s. p. n., 60 – *A. sulphuripennis sulphuripennis* (Switzerland), 61 – *A. sulphuripennis sulphuripennis* (Czechia), 62 – *A. lauianus* (Slovenia).



Fig. 63.



Fig. 64.



Fig. 65.



Fig. 66.



Fig. 67.



Fig. 68.

Fig. 63-68. Abdominal segments of males. 63 – *Anostirus reissi*, 64 – *A. gudenzii*, 65 – *A. colacurcioi*, 66 – *A. marginatus*, 67 – *A. platiai* sp. n., 68 – *A. pseudosulphuripennis*.



Fig. 69.



Fig. 70.



Fig. 71.



Fig. 72.



Fig. 73.



Fig. 74.



Fig. 75.



Fig. 76.



Fig. 77.



Fig. 78.

Figs. 69-78. Aedeagus, ventral view. 69 – *Anostirus sulphuripennis sulphuripennis* (Schwitzerland), length 1.80 mm, 70 – *A. sulphuripennis sulphuripennis* (Czechia), length 1.80 mm, 71 – *A. sulphuripennis penninus*, length 1.90 mm, 72 – *A. lauianus*, length 1.80 mm, 73 – *A. reissi*, length 1.75 mm, 74 – *A. gabilloti*, length 1.75 mm, 75 – *A. marginatus*, length 1,75 mm, 76 – *A. gudenzii*, length 2.0 mm, 77 – *A. maccapanii*, length 2.06 mm and 78 – *A. colacurcioi*, length 1,84 mm.

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