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Two genera of subfamily Doryctinae (Hymenoptera, Braconidae) new for Poland

Abstract: The Doryctinae genera Hypodoryctes Kokujew (with H. sibiricus Kokujew) and Rhaconotus Ruthe [with Rh. elegans (Forster)] are recorded for the first time for the fauna of Poland. Redescriptions and figures of the these genera and species are given. H. sibiricus is first time reported for Bulgaria. Possible host of Hypodoryctes species is discussed.

Key words: Hymenoptera, Braconidae, Doryctinae, Hypodoryctes, Rhaconotus, redescriptions, new records, host, Cerambycidae, Poland, Bulgaria

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INTRODUCTION

The Braconidae is a large group of parasitic Hymenoptera. The family is widely distributed throughout the World and nearly all species parasitize larval stages of the Coleoptera, Lepidoptera and Diptera.

The Doryctinae is one of the most interesting and diversified subfamilies of the idiobiont ectoparasitoids of the family Braconidae. More than 140 valid genera have been described but most of these are restricted to tropical and subtropical regions (Shenefelt & Marsh 1976, Belokobylskij 1992, Marsh 1993). Twenty five genera from six tribes are recorded for the Palearctic fauna, but these data are preliminary because the southern part of the Palearctic is poorly studied. Two genera (Euscelinus Westwood, Mimodoryctes Belokobylskij) penetrate only into the southern part of the Palearctic from the tropics; three genera (Zombrus Marshall, Parallorhogas Marsh, Rhacontisira Belokobylskij) are recorded from the Eastern Palearctic only. Resulting, the members of only 20 genera were previously recorded from the European fauna.
Only 10 genera and 23 species of Doryctinae have been recorded from Poland (Huflejt 1997) but this number does not reflect the true diversity of the Polish doryctine fauna. Two genera (Hypodoryctes Kokujev and Rhaconotus Ruthe) are recorded in this paper as new for the fauna of Poland. The redescriptions of these genera and two species with discussion about distribution, contents and bionomics of these groups are presented below.

The terminology for wing venation follows that of Belokobylskij & Tobias (1998).

**SYSTEMATIC PART**

**Hypodoryctes Kokujev, 1900**

**Type species:** Hypodoryctes sibiricus Kokujev, 1900.

Hypodoryctes Kokujev is one of the most primitive genera in the tribe Doryctini and contains only 3 described species. The type species *H. sibiricus* Kokujev has a very wide distribution and has been recorded not only from many localities of the Palaearctic region (more abundant in the Eastern Palaearctic), but also in Oriental (Myanmar) and North Neotropical (Mexico) regions. Two other species (*H. bilobus* (Shestakov) and *H. torridus* PAPPI) are limited in their distribution to Eastern Asia (southern part of the Russian Far East, Japan, Korea, Taiwan Island). Also at least one undescribed species is recorded from central China. It is quite possible that the centre of the species diversification is located in the Eastern Asia.

The hosts of Hypodoryctes species are as yet unknown. But a specimen of *H. sibiricus* Kokujev from Bulgaria (first record for this country) reared from a cocoon in the tunnel of the larva of Cerambycidae (1 female, “Bulgaria, Vitosa plan., 1450 m n. p. m., 1.IX.1959, L., leg. B. Burakowsk”, “w chodnikach larw kózek”, “larva 1.IX.59, Imago 4.V.60, leg. B. Burakowski, Cult. No 1584/8”, “Inst. Zool. P.A.N., Warszawa, 8160”) is present in the Collection of the Museum and Institute of Zoology PAS. This information, together with the range of hosts for the related genus Onitsira Cameron, support the hypothesis that the larvac of longhorn beetles are probable hosts for Hypodoryctes species.


Mesosoma about twice as long as height. Pronotum anteriorly with distinct and curved up transparent flange. Pronotal carina complete, rather fine, situated submedially. Mesonotum highly and almost perpendicularly raised above pronotum, densely punctulate, entirely densely setose. Median lobe of mesoscutum distinctly protruding forward. Notauli deep and complete. Metanotal tooth absent. Sternauli


Legs. Fore tibia with distinct numerous small spines arranged almost in single row, and with row of dense spines on inner apical margin. Hind coxa with basoventral tubercle. Hind femur elongate-oval, rather thick. Basitarsus of hind tarsus long, 0.7–0.8 times as long as second-fifth segments combined.

First metasomal tergite not petiolate, wide, with deep dorsope; acrosternite not elongate, with distinct basoventral keel. Second tergite with more or less distinct basal triangular area delineated on outer margin by depressions (sometimes very shallow) or at least contrastingly colored stripes; this area petiolate, distally at least shortly separated from second suture. Second suture distinct and straight. Third tergite with fine, but more or less distinct transverse narrow submedian depression. First and second tergites entirely, third at least in basal half, often fourth and fifth tergites submedially sculptured. Ovipositor long, usually about as long as body.


_Hypodoryctes sibiricus_ KOKUJEV, 1900 (Figs 1–10)


_Mixtec uhartomi_ MARSH 1993: 25; BELOKOBIYSKIJ 1995: 166 (as synonym of _H. sibiricus_).


Description. Female. Body length 7.6–8.2 mm; fore wing length 5.0–5.7 mm. Head 1.3–1.5 times as wide as median length. Head behind eyes roundly narrowed. Transverse diameter of eye 1.2–1.5 times as long as temple (dorsal view). POL 0.8–1.0 times OD, about 0.5 times OOL. Malar space height about 0.3 times height of eye, 0.6–0.7 times basal width of mandible. Face width 1.2–1.3 times median height of face and clypeus combined. Width of hypocylopal depression almost equal to distance from depression to eye, 0.4 times width of face.

Antennae 56–segmented. Scapus about 1.5 times as long as maximum width. First flagellar segment 3.3–3.5 times as long as apical width, 1.1–1.2 times as long as second segment. Penultimate segment 2.5 times as long as wide.

Mesosoma. Median lobe of mesoscutum without anterolateral shoulders, with rather deep median longitudinal furrow. Prescutellar depression rather deep, with 3–5 carinae, rugulose. Subalar depression shallow, rather narrow, crenulate-rugose.
Wings. Length of fore wing 3.8–4.0 times as long as wide. Metacarpus 1.3 times as long as pterostigma. Second radial abscissa 2.5–3.0 times first abscissa, 0.45–0.55 times third abscissa, 1.3–1.5 times first radiomedial vein. Second radiomedial cell 2.5–3.3 times as long as wide, almost as long as brachial cell. Brachial cell widened toward apex. Distance between basal vein and nervellus 0.3–0.5 times nervulus length. In hind wing, first costal abscissa 0.7 times second abscissa. First abscissa of mediocubital vein almost equal to second abscissa.

Legs. Hind femur 3.3–3.5 times as long as wide. Hind tarsus 1.1 times as long as hind tibia. Second tarsal segment 0.4–0.45 times as long as basitarsus, 1.5–1.6 times as long as fifth segment (without pretarsus).

Metasoma distinctly longer than head and mesosoma combined. First tergite regularly and distinctly widened from base to apex, its length 1.6–1.7 times apical width; apical width about twice its basal width. Median length of second tergite 1.1–1.2 times its basal width, 1.1–1.2 times length of third tergite. Ovipositor sheath 0.8–1.1 times as long as body, 1.2–1.5 times as long as fore wing.

Sculpture. Vertex smooth. Mesoscutum and scutellum densely punctulate. Mesopleura smooth at most part. Basolateral areas of propodeum smooth at most part, rest part of propodeum coarsely rugose; basal carina 2.0–2.3 times as long as fork of areola. First tergite coarsely rugose-retticulate; second tergite entirely and third in basal 1/2 (medially)–4/5 (laterally) densely and smaller rugulose-reticulate with striation. Fourth and fifth tergites finely or very finely reticulate-coriaceous in basal 1/3–1/4.

Colour. Body black, metasoma mostly dark reddish brown, with reddish brown or light reddish brown stripes and spots on second-fifths tergites. Antenna dark reddish brown to black, light reddish brown basally. Palpi yellow. Legs yellowish brown, infuscate distally, fore and middle coxae and trochanters yellow; hind tibia brown basally, yellow subbasally, reddish brown or light reddish brown in apical half. Ovipositor sheath black. Fore wing faintly infuscate. Pterostigma dark brown, paler basally.

**Distribution.** Finland, Poland (first record), Belarus, Hungary, Croatia, Bulgaria (first record), Azerbaijan, Russia (European part, Urals, Siberia, Far East), Kazakhstan, China, Korea, Japan, Myanmar, Mexico.

**Remarks.** Some specimens of this species from Taiwan have widely smooth metasomal tergites behind second or sometimes also at most part of second tergite (forma niitidis) in comparison with normal and widely distributed form of this species with distinctly sculptured basal parts of fourth and fifth tergites (BELOKOBYLSKI 1996).

**Rhaconotus** Ruthe, 1854

**Type species: Rhaconotus aciculatus** Ruthe, 1854.

The genus *Rhaconotus* is one of the largest genera in subfamily Doryctinae. Most of the known species have been described from tropical and subtropical regions of the Old World, but the knowledge of this genus in Afrotropical and Australian regions is rather poor. This genus is known also in Nearctic (MARSH 1976); some species penetrate into the northern part of Neotropical region (Mexico and Central America: MARSH 1976), but there is no information about the presence of this genus in South America.
Only five species of *Rhaconotus* have been recorded from Europe and most of these species are distributed in the dry, semi-arid or arid territories of Central and South Europe. This genus has not previously been recorded from Poland and it is interesting that the first species in the Poland fauna is not the widely distributed trans-Palaearctic *Rh. aciculatus* RUTHE, but rather rare *Rh. elegans* (FORSTER) that prefers semi-arid habitats.

The genus *Rhaconotus* was placed for many years in the tribe *Rhaconitini* (SHENEFELT & MARSH 1976). Study of phylogenetic relationships in the subfamily *Doryctinae* and study of the types of the numerous *Rhaconotus* species (as well as species of the genera *Ipodoryctes* GRANGER, *Aptenobracon* MARSH, *Arhaconotus* BELOKOBYLSKII and *Mimipodoryctes* BELOKOBYLSKII) from the different regions lead to the downgrading this tribe to subtribe of the tribe *Doryctini* (BELOKOBYLSKII, 1992).

The biological data for *Rhaconotus* species is rather limited. Some species prefer to attack the larvae of the beetles from the families *Buprestidae*, *Curculionidae* and *Bruchidae*. Some Oriental and Palaearctic species [Rh. choenobivorus (ROHWER), *Rh. ollivieri* (GIRAUD), *Rh. testacea* (SZEPLIGETI), *Rh. scirrophagae* WILKINSON], however, parasitize the larvae of moths from families *Pyralidae* (basically) and *Gelechiidae*, which develop inside grass stems (SHENEFELT & MARSH 1976).

**Description.** Head subcubical. Ocelli arranged in triangle with base 1.2–1.3 times its sides. Eyes glabrous, not or weakly concave opposite antennal sockets. Clypeus with more or less distinct lower flange. Malar suture absent or very shallow. Hypoclypeal depression rather small and round. Face with 2 distinct submedian oval depressions above clypeal suture. Occipital carina distinct, usually obliterated ventrally at short distance before reaching hypostomal carina. Postgenal bridge present and narrow. Maxillary palpi 6-segmented, labial palpi 4-segmented. Antennae slender, filiform, and long. First flagellar segment longer than second segment, rarely equal to it. Apical segment without spine apically.

Mesosoma usually 2.0–2.5 times as long as height. Pronotum rather long; pronotal carina usually distinct and situated submedially. Mesonotum often not strongly and sharply elevated but rather more gently-roundly raised above pronotum, densely granulate. Notauli deep and complete, rarely shallow posteriorly. Metanotal tooth present, but sometimes small. Sternauli more or less deep, usually long and crenulate. Prepectal carina distinct, rather wide below. Postpectal carina absent. Metapleural flange rather narrow, long, rounded apically. Propodeum without distinct areolae bordered by carinae, but sometimes with carinally margined basolateral areas.

Fore wing often maculate or infuscate. Radial cell usually not shortened. Second radial abscissa longer than first radiomedial vein. Both radiomedial veins present. Recurrent vein usually distinctly postfurcal. Discoidal cell anteriorly petiolate. Nervus postfurcal. Parallel vein interstitial. Brachial cell closed usually on level of recurrent vein, but sometimes more or less distinctly before it. In hind wing, first abscissa of mediocubital vein distinctly shorter than second abscissa; submedial cell small. Recurrent vein present and usually fine, but sometimes absent.
Legs. Fore tibia with distinct small spines arranged in almost single row, and with row of dense spines on inner apical margin. Hind coxa with basoventral tubercle. Hind femur elongate-oval, rather thick, with more or less distinct dorsal protuberance. Basitarsus of hind tarsus long, 0.6–0.7 times as long as second-fifth segments combined.

First metasomal tergite not petiolate, rather wide, with deep dorsop; acrosternite not elongate. Second tergite usually without areas, but sometimes with more or less distinct apical lenticular or linear area delineated by curved furrow. Second suture deep and almost straight. Fourth and fifth tergites basally with deep and crenulate transverse furrow. Fifth or (rarely) sixth tergite enlarged, longer than previous segment. First-fourth tergites entirely or almost entirely densely striate. Ovipositor rather short, usually not longer than metasoma.

**Distribution.** Palaeartic, Nearctic, Oriental, Australian and Afrotropical Regions. Penetrates in the northern part of Neotropical Region.

*Rhacanotus elegans* (FORSTER, 1862) (Figs 11–20)

_Hedysonus elegans_ FORSTER, 1862: 238.


**Description.** Female. Body length 3.7–3.8 mm; fore wing length 2.4–2.5 mm. Head width 1.5–1.6 times its median length. Head behind eyes distinctly roundly narrowed. Transverse diameter of eye 1.5–1.6 times length of temple. Ocelli small, arranged in triangle with base 1.1–1.2 times its sides; POL 1.2–1.6 times Od, 0.3–0.4 times OOL. Eye glabrous, weakly emarginated opposite antennal sockets, 1.1–1.2 times as high as broad. Malar space height 0.7–0.8 times height of eye, 1.4–1.7 times basal width of mandible. Face width 1.35–1.5 times height of eye and 1.3–1.4 times height of face and clypeus combined. Malar suture present, but very shallow. Upper margin of clypeus situated below lower level of eyes. Hypoclypeal depression round, its width 0.6–0.7 times distance from edge of depression to eye, 0.4 times width of face. Vertex convex.

Antennae slender, weakly setiform, 33-segmented, 1.2 times as long as body. Length of scapus 1.5–1.6 times its maximum width. First flagellar segment 4.5–5.0 times as long as its apical width, 1.1–1.15 times as long as second segment. Penultimate segment about 3.0 times as long as wide, 0.5 times as long as first segment, 0.8 times as long as apical segment; the latter pointed apically.

Mesosoma. Length 2.2–2.3 times its height. Pronotum anteriorly almost straight (dorsal view), regularly convex dorsally (lateral view). Pronotal carina high, distances from carina to anterior and posterior margins of pronotum subequal. Mesoscutum highly and roundly raised above pronotum. Notauli rather deep, complete, crenulate. Median lobe of mesoscutum without median depression. Prescutellar depression rather deep, with median and four lateral carinae, distinctly and almost linearly directed posterolaterally, sparsely rugulose, 0.25–0.3 times as long as scutellum.
Scutellum weakly convex, with distinct lateral carinae. Sternaui shallow, finely crenulate with dense granulation, weakly curved, running along almost entire lower part of mesopleura, shortly separated from lower edge of subalar depression anteriorly. Prepectal carina distinctly widened ventrally, with small widened lobes opposite fore coxae. Subalar depression rather shallow, narrow, densely crenulate. Metanotum with very small tooth. Metapleural lobe rather long, narrow, rounded apically.

Wings. Length of fore wing 4.5 times its maximum width, shorter than distance from tegula to apex of metasoma. Radial cell weakly shortened. Metacarpus 1.1 times as long as pterostigma. Radial vein arising almost from middle of pterostigma. First radial abscissa forming obtuse angle with second abscissa. Second radial abscissa 4.5–5.0 times as long as first abscissa, 0.7 times as long as almost straight third abscissa, 1.6–2.0 times as long as first radiomedial vein. Second radiomedial cell not widened distally, its length 3.7–3.8 times maximum width, 1.2–1.4 times length of rather narrow brachial cell. First medial abscissa weakly S-shape. Recurrent vein weakly postfurcal. Mediocubital vein weakly but rather distinctly curved to anal vein in distal half. Distance from nervulus to basal vein 0.5–0.7 times nervulus length. Brachial cell obliquely and weakly roundly closed distinctly before level of recurrent vein; posterior bulla on brachial vein absent; posterior abscissa of anal vein (behind brachial vein) absent or very shortly present. Hind wing 6.0 times as long as wide. First costal abscissa 0.4–0.5 times second abscissa. First abscissa of mediocubital vein 0.35–0.4 times second abscissa. Recurrent vein absent or very short.

Legs. Hind femur with rather distinct dorsal protuberance, its length 3.2–3.3 times maximum width. Hind tarsus slightly longer than hind tibia. Hind tibia apically with 4 outside spines. Hind basitarsus 0.6–0.65 times combined length of second-fifth segments. Second tarsal segment 0.5–0.55 times as long as basitarsus, 1.8–2.2 times as long as fourth segment, 1.5 times as long as fifth segment (without pretarsus).

Metasoma 1.1 times as long as head and mesosoma combined, with 5 visible tergites. Apical width of first tergite about twice its basal width, its length 1.25–1.3 times apical width. Second tergite without basal area, with shallow and almost straight transverse furrow and more or less distinctly separated elongate or almost lenticular apical area, this area 0.6–0.8 times as long as rest part of tergite. Median length of second tergite 0.7–0.8 times its basal width, 1.3–1.4 times length of third tergite. Second suture rather deep and wide. Fifth tergite long, weakly convex in posterior margin, without median emargination and posteroventral lobes. Fifth tergite 1.4–1.5 times as long as fourth tergite, 1.5–1.7 times as long as third tergite. Ovipositor sheath 0.4–0.45 times as long as metasoma, 1.6–1.7 times as long as first tergite, 0.6 times as long as mesosoma, 0.33–0.35 times as long as fore wing.

Sculpture and pubescence. Head entirely densely granulate. Sides of pronotum entirely densely granulate-coriaceous, partly rugose in upper posterior area, with shallow and marginate submedian crenulate depression. Mesoscutum and scutellum densely granulate, mesoscutum with 2 rather fine convergent striae medioposteriorly and sometimes fine rugosity between it. Mesopleura entirely granulate-reticulate. Metapleura densely granulate-coriaceous in anterior half, rugulose-granulate in posterior half. Propodeum without marginate areas, with short lateral and long median
carinae; propodeum reticulate-granulate in basal 2/5, rugose with granulation in apical 3/5. Hind coxa and femur entirely densely granulate, but granulation finer below. First tergite with almost complete dorsal carinae, coarsely striate, with fine and dense rugulosity between striae, densely granulate basally. Second-fourth tergites densely longitudinally striate with fine rugulosity between striae, apical 1/5 of third and fourth tergites smooth. Fifth tergite very densely and finely reticulate-striate basally, finely reticulate-coriaceous at most part, almost smooth apically. Second-fifth tergites laterally very densely reticulate-coriaceous, with additional fine striation on second and sometimes third tergites. Vertex with short, very sparse semi-erect hairs directed forward, glabrous medially at least partly. Mesoscutum with rather dense semi-erect short hairs arranged along notauli and marginally. Hind tibia with erect, rather dense and short hairs dorsally; length of these hairs 0.5-0.8 times maximum width of hind tibia.

Colour. Head and promesosoma light reddish brown, head dorsally or sometimes mostly darker, remaining parts of body black, metasoma medially reddish brown. Antenna light reddish brown in basal 1/3, dark reddish brown to black in apical 2/3, 2 basal segments yellowish brown. Palpi light reddish brown, partly infuscate. Legs light reddish brown, hind coxa and femur dark at most parts, hind tibia yellowish brown in basal half. Ovipositor sheath black, paler basally. Wings hyaline, with 2 large dark spots around basal vein and brachial cell and around second radiomedial cell. Pterostigma dark brown, yellow in basal 1/3.

**Distribution.** Germany, Poland (new record), Hungary, Ukraine, Russia (south of the European part), Georgia, Kazakhstan, Turkmenistan, Uzbekistan, Tajikistan.

**Remarks.** It is a rare species, which was recorded only in a few places of the Western Palearctic. This species was synonymised with *Rh. aciculatus* RUTHE (PAFF 1984), but the study of the holotype and additional material from several places distinctly showed that it is a separate species (BELOKOBYLSKIJS 1990). *Rh. elegans* (FÖRSTER) differs from *Rh. aciculatus* in having the ovipositor sheath short, the fore wing shortened, the radial cell weakly shortened, the brachial cell closed before recurrent vein, and the hairs on the dorsal surface of hind tibia longer.

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**REFERENCES**


STRESZCZENIE

[Tytuł: Dwa rodzaje z podrodziny Doryctinae (Hymenoptera, Braconidae) nowe dla Polski]

Praca zawiera informację o pierwszych stwierdzeniach w Polsce dwóch gatunków \textit{Hypodoryctes sibiricus} (KOKUJEV) i \textit{Rhaconotus elegans} (FÖRSTER). Dotychczas nie stwierdzono na terenie Polski innych gatunków z tych rodzajów. W pracy zamieszczono opisy rodzajów \textit{Hypodoryctes} KOKUJEV i \textit{Rhaconotus} RUTHE oraz opisy i ilustracje wyżej wymienionych gatunków.