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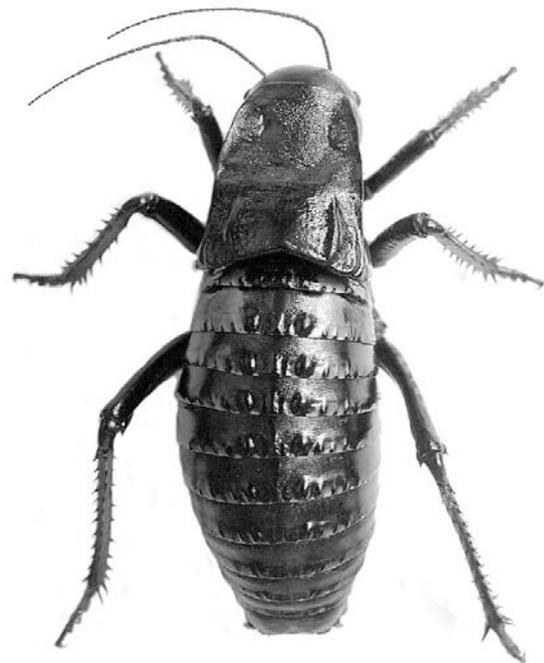


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Yantaromyrmex gen. n. – a new ant genus (Hymenoptera: Formicidae) from Late Eocene ambers of Europe

Yantaromyrmex gen. n. – новый род муравьев (Hymenoptera: Formicidae) из позднеэоценовых янтарея Европы

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Key words: Hymenoptera, Formicidae, *Yantaromyrmex*, new genus, new species, Late Eocene, amber, Europe.

Ключевые слова: Hymenoptera, Formicidae, *Yantaromyrmex*, новый род, новые виды, поздний эоцен, янтарь, Европа.

Abstract. A new genus of ants from the Late Eocene ambers of Europe is described. *Yantaromyrmex* gen. n. includes five species, three of them have been previously described in the genera *Hypoclinea* Mayr, 1855 (*Y. constrictus* (Mayr, 1868), **comb. n.**, and *Y. geinitzi* (Mayr, 1868), **comb. n.**) and *Iridomyrmex* Mayr, 1862 (*Y. samlandicus* (Wheeler, 1915), **comb. n.**), and were transferred to the genus *Anonychomyrma* Donisthorpe, 1947 in the recent revision of the genus *Iridomyrmex* [Heterick, Shattuck, 2011]. Two new species, *Y. intermedius* sp. n. and *Y. mayrianum* sp. n., are described. Species of the new genus combine plesiomorphic characters of both *Iridomyrmex* and *Anonychomyrma*, but cannot be included to any of these genera. Probably the genus *Yantaromyrmex* gen. n. is ancestral to both of these genera and for the tribe *Iridomyrmecini* sensu Dubovikoff [2005], as a whole. A key to species of the genus *Yantaromyrmex* gen. n. based on workers is given.

Резюме. Описан новый род муравьев из позднеэоценовых янтарея Европы, *Yantaromyrmex* gen. n., включающий пять видов. Три из них были описаны ранее в родах *Hypoclinea* Mayr, 1855 (*Y. constrictus* (Mayr, 1868), **comb. n.** и *Y. geinitzi* (Mayr, 1868), **comb. n.**) и *Iridomyrmex* Mayr, 1862 (*Y. samlandicus* (Wheeler, 1915), **comb. n.**), а в последней ревизии рода *Iridomyrmex* [Heterick, Shattuck, 2011] были перенесены в род *Anonychomyrma* Donisthorpe, 1947. Описаны два новых вида, *Y. intermedius* sp. n. и *Y. mayrianum* sp. n. Виды нового рода сочетают в себе плезiomорфные признаки как *Iridomyrmex*, так и *Anonychomyrma*, но не могут быть отнесены ни к одному из этих родов. Вероятно, род *Yantaromyrmex* gen. n. является предковым как для этих двух родов, так и для трибы *Iridomyrmecini* sensu Dubovikoff [2005] в целом. Дается определительный список видов рода *Yantaromyrmex* gen. n. по рабочим особям.

Introduction

Yantaromyrmex gen. n. is a new genus that, however, has a long and very interesting taxonomic history. The history starts from G. Mayr, who described three fossil species of the genus *Hypoclinea* Mayr, 1855 from Baltic amber: *H. constricta* Mayr, 1868, *H. geinitzi* Mayr, 1868 и *H. goepperti* Mayr, 1868 [Mayr, 1868]. Later [Dalla Torre, 1893], these species were transferred to the genus *Bothriomyrmex* Emery, 1869. Wheeler [1915] indicated the fallacy of attributing these species to *Bothriomyrmex*, transferred them to the genus *Iridomyrmex* Mayr, 1862 and described two new fossil species of the genus – *I. oblongiceps* and *I. samlandicus*. *Hypoclinea goepperti* was transferred to the genus *Liometopum* Mayr, 1861, *H. constricta* and *I. samlandicus* were transferred to the genus *Anonychomyrma* Donisthorpe, 1947 and *H. geinitzi* and *I. oblongiceps* were left in the genus *Iridomyrmex* in the taxonomic revisions of the subfamily Dolichoderinae by Shattuck [1992, 1994]. It should be noted, that he had studied only two specimens of *H. goepperti* and one of *H. geinitzi* in the Muséum d'Histoire Naturelle, Geneva, Switzerland (not type material) and had not seen any specimens of other species [Shattuck, 1994]. Afterwards, his point of view was taken by Bolton [1995]. One of us [Dlussky, 1997] proved that *H. goepperti* can not belong to the genus *Liometopum*, but for other species we also took the standpoint of S.O. Shattuck. Later *I. oblongiceps* was transferred to the genus *Ctenobethylus* Brues, 1939 [Dlussky, Rasnitsyn, 2009], and then placed in the new monotypic genus *Eldermymex* Heterick, Shattuck, 2011 [Heterick, Shattuck, 2011]. Meanwhile, *H. geinitzi*, *H. constricta* and *I. samlandicus* were included in the genus *Anonychomyrma* [Heterick, Shattuck, 2011].

The last three species undoubtedly are congeneric, but differ from the extant genera *Iridomyrmex* and *Anonychomyrma*. Both of these genera differ from the rest

Dolichoderinae by the following combination of characters according to Shattuck [1992]: compound eyes present; scapes surpassing the posterior margin of head by less than one-half (often less than one-third) their length; psammophore absent; palp formula 6 : 4; mandibles with 5 to 12 teeth and generally at least a few denticles; anterolateral clypeal margin posterior to the mediolateral region and separated from it by humerus; petiolar scale present; declivitous face of propodeum usually convex, less commonly flat or concave; propodeal spiracle located laterally; metanotal

Table 1. The differences between *Anonychomyrma* and *Iridomyrmex* [Shattuck, 1992].

Табл. 1. Различия между *Anonychomyrma* и *Iridomyrmex* [Shattuck, 1992].

Character	<i>Anonychomyrma</i>	<i>Iridomyrmex</i>
Position of compound eyes	anterior	posterior
Anteromedial clypeus	entire	toothed
Basal mandibular margin	denticulate	partially denticulate
Fourth gastral sternite	keel-shaped	flat

(mesopropodeal) groove present as either notch or angle between mesonotum and propodeum; 1st gastral segment generally vertical, or occasionally projecting anteriorly and not concealing the petiole in dorsal view; 5th gastral tergite ventral; integument thin and flexible, generally weakly sculptured. All these characters are also present in *H. geinitzi*, *H. constricta*, *I. samlandicus* and in two new species described below.

Shattuck [1992: 42] indicated the following differences between *Iridomyrmex* and *Anonychomyrma*: “The workers and queens of *Anonychomyrma* differ from *Iridomyrmex* in the placement of the compound eyes, the configuration of the anterior clypeal and basal mandibular margins, and the shape of the fourth gastral sternite (Tab. 1). Additionally, the workers of *Anonychomyrma* have the pronotum, mesonotum and propodeum strongly arched whereas these regions in *Iridomyrmex* are generally only weakly arched”.

Late Eocene species have the slightly convex anterior margin of clypeus, without teeth, and their eyes shifted forward stronger than in most of *Iridomyrmex* (Fig. 1). At the same time, like *Iridomyrmex*, they have no teeth on the basal edge of mandible and have flat (not keel-shaped) fourth abdominal tergite. Pronotum, mesonotum and propodeum in *I. constricta* and *I. samlandicus* are more convex than in *I. geinitzi* but these are clearly specific rather than generic differences. Moreover, according to diagnosis of Shattuck [1992] the males of *Anonychomyrma* and *Iridomyrmex* lost rm cell on fore wings, whereas males of *I. geinitzi* (males of other species unknown) have it. Thus these species combine plesiomorphic characters of both genera, *Anonychomyrma* (position of eyes, shape of clypeus) and *Iridomyrmex* (mandibles and structure of the 4th abdominal sternum) and have plesiomorphic (for the entire Dolichoderinae) type of fore wing venation of males and females, that all makes us to describe for them a separate genus.

New ideas on the phylogeny of the subfamily Dolichoderinae, obtained on the basis of of the molecular

data [Ward et al., 2010] confirmed the monophyly of some previously proposed groups [Dubovikoff, 2005]. In one recent paper [Heterick, Shattuck, 2011] on the basis of the data of previous researchers, the time of divergence of major branches of the genus-group “*Iridomyrmex*” (= *Iridomyrmecini* Dubovikoff, 2005, part) and the time of origin of *Anonychomyrma* and *Iridomyrmex* were shown (Fig. 2). The time of origin (or time of early divergence) of this group is estimated to be 23 million years ago (Lower Miocene), whereas the species which we include to *Yantaromyrmex* **gen. n.** date back by the latest data [La Pola, Dlussky, Perrichot, 2013] to the Late Eocene (37–42 Ma). It is especially strange that the Late Eocene species were included in the genus *Anonychomyrma* (in the same article), whose age is estimated by the authors not more than 12 million years. Most likely, the new genus that we describe here should be considered as ancestral for *Anonychomyrma* and *Iridomyrmex*.

Material and methods

During this revision we examined 557 specimens of species belonging to the genus *Yantaromyrmex* **gen. n.** of European Late Eocene ambers from museums and private collections listed below. Numbers of studied specimens of each kind of ambers, respectively: Baltic amber – 332, Rovno amber – 119, Bitterfeld amber – 82, Scandinavian amber – 18 and 6 amber pieces with the origin unknown for us. The number of studied specimens of each species are listed in the relevant species essays.

Acronyms of depositories:

PIN – Paleontological Institute of Russian Academy of Sciences, Moscow, Russia;

SIZK – Schmalhausen Institute of Zoology, National Academy of Sciences of Ukraine, Kiev, Ukraine (Rovno amber);

MZ PAN – Muzeum Ziemi PAN, Warsaw, Poland;

BMNH – Natural History Museum, London, United Kingdom (including some material from Thery’s collection, identified by Emery [1905]);

NHMW – Naturhistorische Museum, Wien, Austria (includes a part of Mayr’s [1868] types from Baltic amber);

GZG.BST – Geowissenschaftlicher Zentrum der Georg-August-Universität Göttingen, Göttingen, Germany (Baltic amber, a collection formerly housed in the Geological Institute of Königsberg);

HMC – Humboldt Museum, Berlin, Germany;

ZMUC – Zoological Museum, University of Copenhagen, Copenhagen, Denmark (Scandinavian amber);

GCG.BST (MKC) – personal collection of M. Kutscher, Sassnitz, Rügen, Germany (recently acquired by the GZG. BST);

CGC – C. Groehn collection, Glinde, Germany;

VGC – personal collection of V.A. Gussakov, Korolev, Moscow Region, Russia;

SSC – personal collection of S.A. Suvorkin, Kiev, Ukraine;

ZISP – Zoological Institute of Russian Academy of Sciences, St. Petersburg, Russia (Baltic amber);

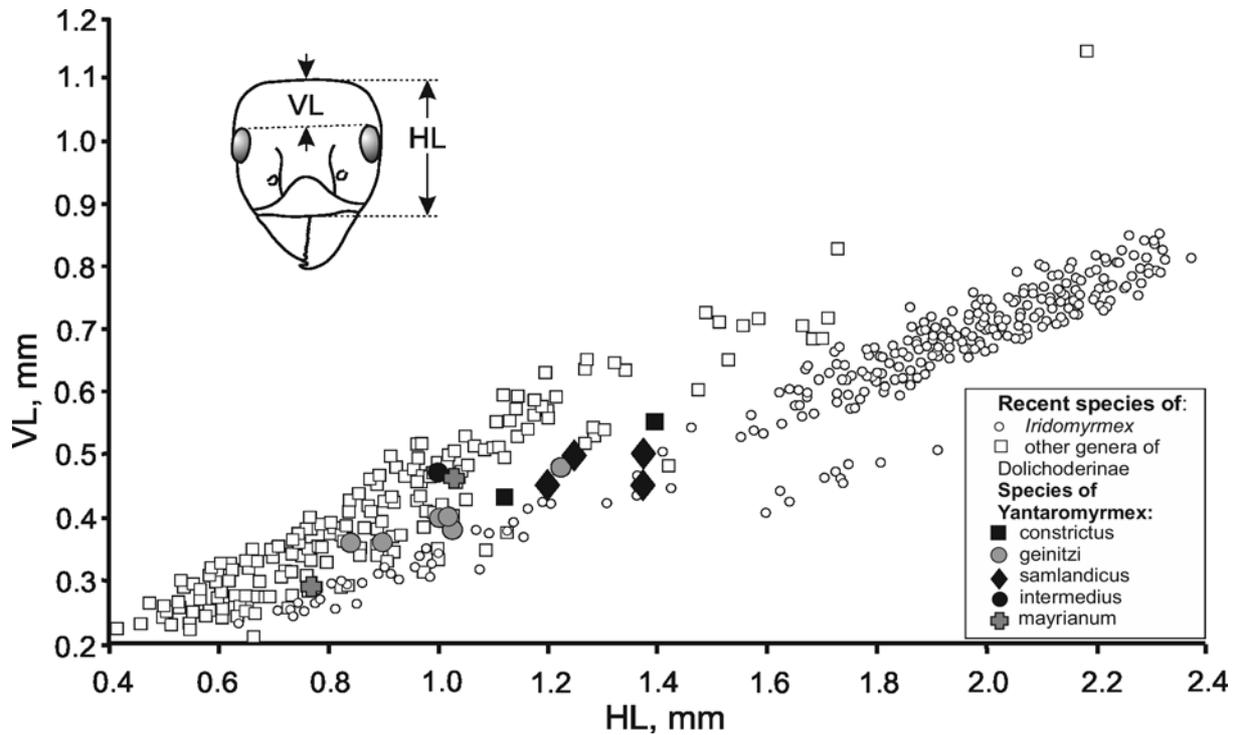


Fig. 1. Correlation between the length of the head (HL) and the distance from the line connecting the rear edges of the eyes and the occipital margin of head (vertex length – VL) in the modern Dolichoderinae (after Shattuck [1992]) and *Yantaromyrmex* gen. n. of Late Eocene ambers.

Рис. 1. Связь между длиной головы (HL) и расстоянием от линии, соединяющей задние края глаз и затылочный край головы (vertex length – VL), у современных Dolichoderinae (по Shattuck [1992]) и *Yantaromyrmex* gen. n. из позднеэоценовых янтарей.

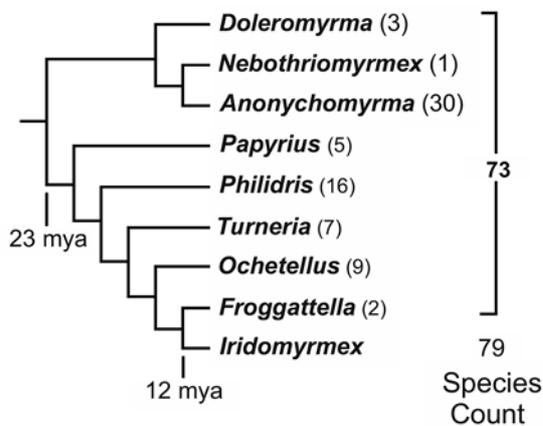


Fig. 2. Phylogeny and divergence time of *Iridomyrmex* and related genera by molecular-genetic data [Heterick, Shattuck, 2011].

Рис. 2. Филогения и время дивергенции *Iridomyrmex* и близких родов по молекулярно-генетическим данным [Heterick, Shattuck, 2011].

GPI – Geological-Paleontological Institute of Hamburg University, Hamburg, Germany (Baltic and Bitterfeldian ambers).

The following abbreviations are used for measurements: AL – maximum length of mesosoma measured diagonally from the meeting point of pronotum and neck to furthest posterior extension of metapleuron; AW – width of mesosoma; BL – total body length; EL (eye length) – maximum length of eye; F3 – length of hind femur; FWL – forewing length; HL (head length) – length

of head in full-face view, taken along a straight line from mid-point of anterior margin of clypeus to mid-point of posterior margin or to mid-point of the transverse line that relates to the level of posterior margins of occipital lobes if posterior cephalic margin is concave; HW (head width) – maximum width of head in frontal view, excluding eyes; SL (scape length) – length of antennal scape excluding basal condylar articulation; VL (vertex length) – distance from upper edge of eye to occipital margin of head.

All measurements are given in mm and provided with accuracy to 0.01 mm.

Taxonomic part

Yantaromyrmex gen. n.

= *Hypoelinea* Mayr, 1855 (part).

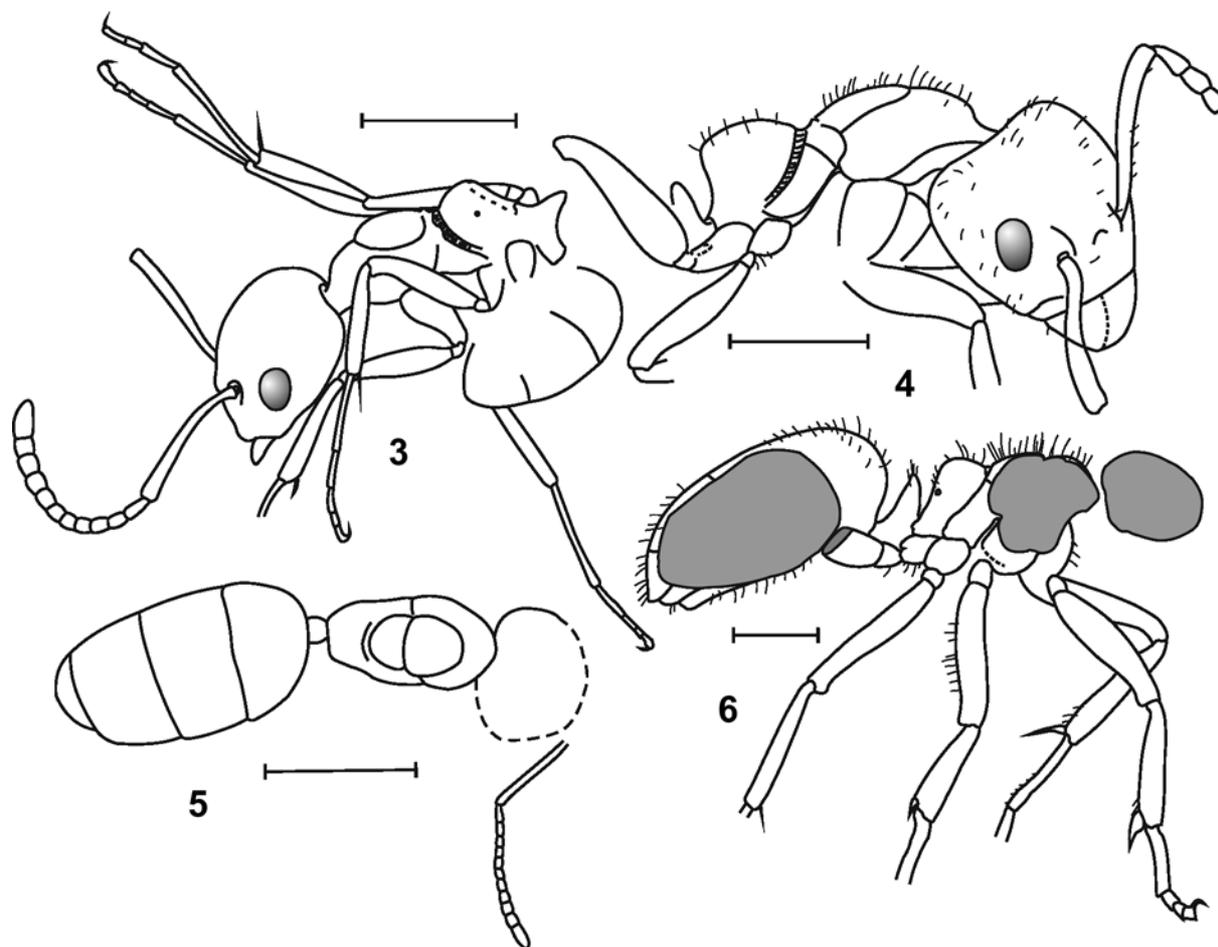
= *Bothriomyrmex* Emery, 1869 (part).

= *Iridomyrmex* Mayr, 1862 (part).

= *Anonychomyrma* Donisthorpe, 1947 (part.).

Type species: *Hypoelinea geinitzi* Mayr, 1868.

Diagnosis (only for workers, for presence and characters of females or males see species essays below). Head trapezoidal, tapering anteriorly, occipital margin straight or slightly concave; occipital corners are rounded. Eyes oval, located slightly anterior to the middle part of head sides. Ocelli are absent. The anterior edge of clypeus straight, slightly convex or slightly concave, not bidentate. Antennae 12-segmented, scape surpassing of occipital margin of head. Mandibles triangular, with teeth on masticatory margin and without additional teeth on the



Figs 3–6. *Yantaromyrmex constrictus* (Mayr, 1868), **comb. n.**

3 – worker, general view of the specimen GZG.BST.05015 (Baltic amber), chaetotaxy omitted; 4 – worker, head and mesosoma of the specimen HMC 14/205 (Bitterfeld amber); 5 – pseudogyne, top view; 6 – worker, body of the specimen HMC 12/222 (Bitterfeld amber) (see explanation in text).

Рис. 3–6. *Yantaromyrmex constrictus* (Mayr, 1868), **comb. n.**

3 – рабочий, общий вид экземпляра GZG.BST.05015 (Балтийский янтарь), опушение не показано; 4 – голова и грудь экземпляра HMC 14/205 (Биттерфельдский янтарь); 5 – псевдогигана, вид сверху; 6 – тело экземпляра HMC 12/222 (Биттерфельдский янтарь) (см. пояснения в тексте).

basal margin. Maxillary palps 6-segmented, but rather short, reaching about half distance from mouth up to foramen magnum. Labial palps 4-segmented. Mesosomal sutures well expressed. Pronotal shoulders without tubercles or keels. Mesopropodeal impression expressed. Declivous faces of propodeum in profile straight or slightly concave. Petiole with scale. Front surface of the 1st gastral tergite vertical, does not cover petiole. 4th abdominal sternum flat, not keeled. 5th gastral tergite tucked down and not visible from above. Body of a weak surface shagreen sculpture.

Etymology. From Russian word “янтарь” (yantar) – amber and Greek word “μυρμήγκα” – ant. Gender masculine.

Species composition. The genus includes five species from Late Eocene ambers of Europe which are listed below.

Yantaromyrmex constrictus (Mayr, 1868), **comb. n.**
(Figs 3–5)

Types. Mayr [1868] described this species from 11 specimens (10 workers and “gynandromorph”), of which are now remained one worker in NHMW (184/31/243, designated herein as lectotype) and ergatoid male in GZG.

BST (No 05045 (original number 7595/309), designated herein as paralectotype).

Studied material. Baltic amber: paralectotype (ergatoid male) GZG. BST No 05045 (7595/309). Not type material: GZG.BST No 04110 (α30, K790), 04704 (G1836), 04705 (G1832), 04716 (G4537), 04729 (G4536), 04731 (B5326), 04742 (G4535), 04796 (G4269), 04808 (G1838), 05009 (B1027), 05015 (B981), 05021 (B670), 05023 (B1342) (workers, determined by Wheeler [1915] as *Iridomyrmex constrictus*), GZG.BST No 04746 (B1084) (pseudogyne, determined by Wheeler [1915] as *Iridomyrmex constrictus*), GZG.BST No 04999 (K5080) (worker, determined by W.M. Wheeler as *Dolichoderus balticus* (Mayr, 1868)), GZG.BST.03835 (K1055). Bitterfeld amber: HMC No 7/233, 10/208 (worker and larva), 11/391, 14/205, 14/258. Rovno amber: SIZK No D-2223 (6 workers in the same amber piece), K-5117; AWC No 25176. Scandinavian amber: ZMUC No 218 (Fjaldring Pland S.) and 249 (G.V. Henningsen, 26.02.1955).

Description. Worker (Fig. 3). Body comparatively dense. Body length 4–5.5 mm. Head somewhat narrower anteriorly, with convex sides and slightly concave occipital margin. Its length is approximately equal to width. Eyes oval, located slightly anterior to middle part of head. Maximum length of eye 4–4.5 times less than length of head. Anterior margin of clypeus slightly convex, occasionally with a small notch in the middle. Scape surpassing of occipital margin of head about one-third of own length, its length approximately equal to head length (HL/SL = 0.9–1.1). Promesonotum convex in profile with a weak but quite distinct promesonotal impression. Mesopropodeal impression comparatively narrow and deep. Mesopropodeal suture on sides

is wide and deep, with a sculpture of transverse wrinkles (Fig. 3). Propodeum angular in profile, its dorsal surface arcuate convex and declivous slightly concave, length of dorsal surface is approximately equal to length of declivous (Figs 3, 4). Legs relatively short and thick, length of hind femur 1.5–2 times less than mesosoma. Whole body, including ventral side, occipital margin of head, scape and tibia with rather numerous erect and semierect hairs (Fig. 4). At least on head very tender accumbens pubescence (seen on the specimen HMC 14/205). Length of hairs much smaller than distance between them.

Pseudogyne (Fig. 5). Body length of 3.6 mm. Similar to the worker, different from which by complete development of mesosomal tergites. Mesosoma narrower than head, its length in 1.8 times longer than wide. Scutum length approximately equal to width, length of scutellum is less than width.

Measurements. Workers: GZG.BST No 04796: AL=1.5, HL=1.18, HW=1.1, SL=1, EL=0.24; HMC No 14/205: AL=2.2, HL=1.4, SL=1.3, EL=0.35, VL=0.55, F3L=1.1; ZMUC No 218: AL=1.4, SL=1, EL=0.23; ZMUC No 249: AL=1.2, HL=1.1, SL=1.2, EL=0.25, VL=0.43. Pseudogyna: GZG.BST No 04746: AL=1.1, AW=0.6, HW=0.9.

Remarks. Mayr [1868] described a gynandromorph (“Zwitter”) of this species. Wheeler [1915] re-examined this specimen, made supplements to Mayr’s description and made a precise drawing and suggested that it was not an ugly specimen (gynandromorph), but a real ergatoid male. Similar males were already known in some Ponerinae (*Hypoconera* Santschi, 1938), Myrmicinae (*Cardiocondyla* Emery, 1869, *Formicoxenus* Mayr, 1855) and Dolichoderinae (*Technomyrmex* Mayr, 1872). This specimen is similar to a worker, but has large bulging eyes, 13-segmented antennae, more rounded propodeum and the presence of genitalia.

In the collections of Bitterfeld amber we found two not completely preserved inclusions of workers which are different from the other *Y. constrictus* by more numerous erected hairs. On the specimen GZG.BST No 27.145 it is possible to see only the head. A typical *Y. constrictus* has no more than a dozen projecting hairs on scape, but this specimen has much more. Moreover, the eyes of this specimen slightly offset upward from the midline of head, while in the true *Y. constrictus* the condition is an opposite. The second specimen (HMC No 12/222) retained only part of mesosoma, petiolus, abdomen and legs (Fig. 6). Erect hairs on these body parts are much longer and thicker than in typical *Y. constrictus*. Perhaps, these specimens belong to a yet undescribed species, but preservation of the specimens and lack of information about variability within *Y. constrictus* do not allow describing them.

Yantaromyrmex geinitzi (Mayr, 1868), **comb. n.**
(Figs 7–13)

Types. G. Mayr described this species from 168 specimens. At present time, only 10 workers in the collection of NHMW (1984/31/233–1984/31/242) and 4 workers in the collection of GZG.BST (No 172.IV.23, 259.IV.34, 68.IV.11, 78.IV.13) were preserved. A lectotype is not designated, because we did not see specimens from NHMW, and specimens from GZG are poorly preserved.

Studied material. 511 specimens: Baltic amber, 282 specimens, including: GZG – 163 workers, 4 females and male, including syntypes (workers) (GZG.BST No 05040 (172.IV.23), 05042 (68.IV.11), 05043 (78.IV.13), 05044 (259.IV.34)) and 100 worker specimens, determined by W.M. Wheeler; BMNH – 13 workers, including 4 specimens determined

by C. Emery; CGC – 3 workers, 4 pupae; MZ PAN – 34 workers, 1 male (No 2177/12); PIN – 32 workers; VGC – 7 workers; ZISP – 2 workers; ZMUC – 3 workers; GPI – 18 workers and 1 male. Bitterfeld amber, 74 specimens, including: HMC – 42 workers; GZG (GCG.BST (MKC) – 21 workers, 1 male (GZG.BST No 27.023). Rovno amber, 111 specimens, including: SIZK – 97 workers. Scandinavian amber: ZMUC – 15 workers, 2 pupae. Amber of unclear origin: ZMUC – 5 workers.

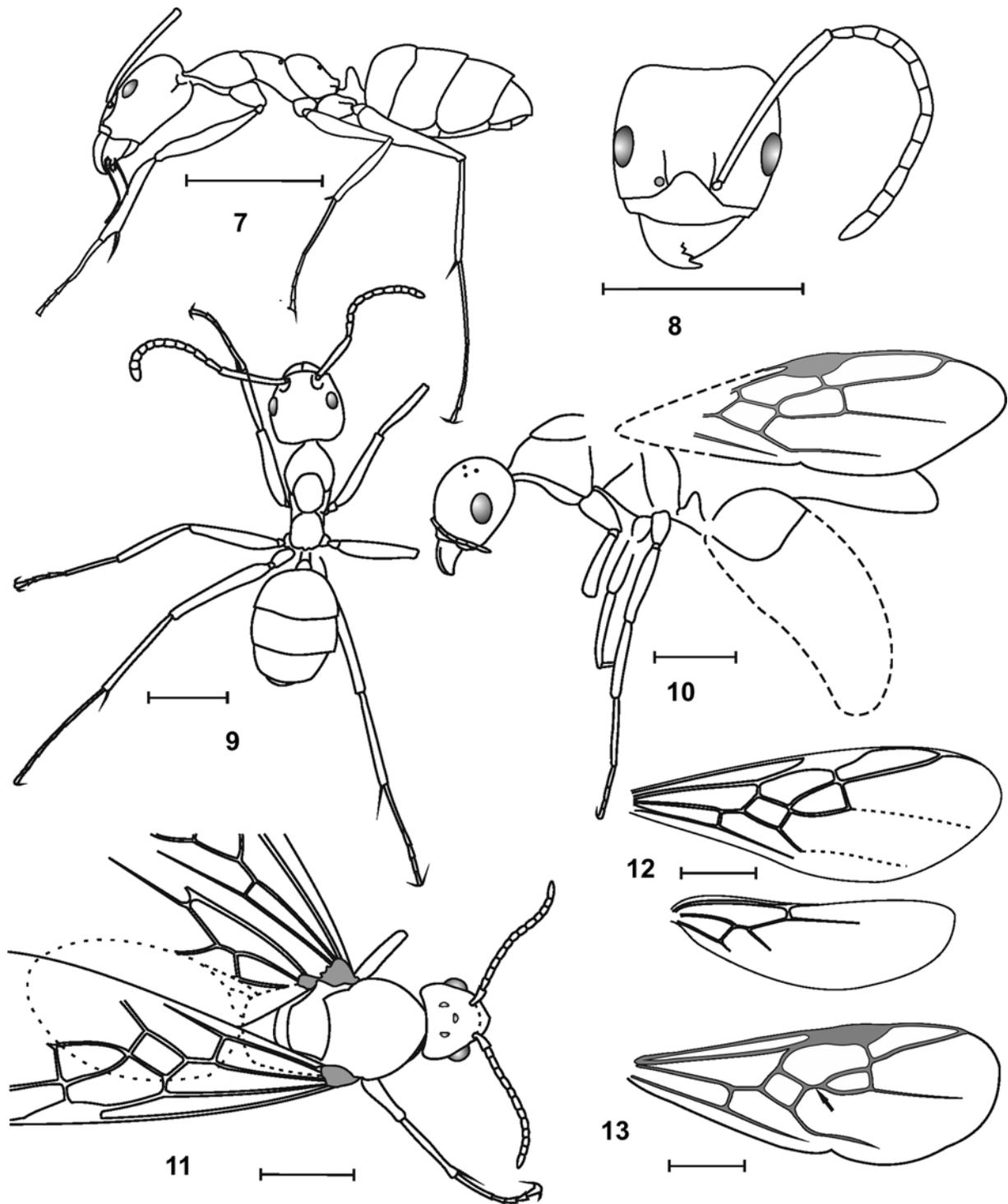
Description. Worker (Figs 7–9). Body slender, legs are relatively long and thin. Body length 3.5–5.5 mm. Head somewhat narrower anteriorly, with convex sides and slightly concave occipital margin. Its length is approximately equal or slightly more than width (HL/HW = 0.95–1.2). Eyes oval, slightly offset forward. Maximum length of eye in 4–5 times less than length of head. Anterior margin of clypeus straight or slightly convex, sometimes with a small notch in the middle. Maximum diameter of eye 4–5 times less than length of head. Anterior margin of clypeus straight or slightly convex, sometimes with small notch in the middle. Scape is surpassing occipital margin of head more than one third of own length, its length approximately equal to head length (HL/SL = 0.9–1.1). Promesonotum in profile weakly and uniformly convex. Mesopropodeal impression broad and shallow. Propodeum smoothly rounded, its declivous surface in profile slightly convex, rarely straight. Mesopropodeal suture on the sides a narrow and has a normal structure. Legs relatively long and slender: length of hind femur is equal or slightly less than mesosoma (AL/F3L = 1–1.3). On head, erect hairs always on clypeus, and almost always on frons; occipital margin of head without erect hairs. Mesosoma without projecting hairs or with 1–2 pairs of short straight hairs on pronotum. Erect hairs on the top of abdomen rather numerous and short. Some specimens have accumbens pubescence on abdomen with very short hairs.

Female (Fig. 10). Body length 5.1 mm. Scape is surpassing occipital margin of head. Eyes oval. Propodeum rounded, its basal surface less than declivous. Petiolus with inclining scale, its anterior side convex and posterior concave, its apex is acuminate. Forewings with rm cell.

Male (Figs 11–13). Body length 4.6–5.1 mm. Erect hairs absent. Body sculpture is weak. Wings always with rm cell, which form can be clearly quadrangular or almost triangular with strongly shortened 2M vein. Cell shape can vary on wings of one specimen. Specimen K-2886 has rm with “petiole” (Fig. 13). Scape longer than the first two segments of flagellum. The first two flagellar segments approximately equal in length, their length twice more than width.

Measurements. Workers: syntype GZG.BST No 05040: AL=1.4; other specimens (n=17): AL=1.22–1.75 (average 1.43, n=19), HL=0.84–1.23 (average 1, n=6), HW=0.85–1 (average 0.93, n=5), SL=0.84–1.20 (average 1.03, n=12), ED=0.19–0.28 (average 0.24, n=10), VL=0.21–0.48 (average 0.37, n=10), F3L=1–1.55 (average 1.29, n=13), HL/HW=1.05–1.21 (n=2), HL/SL=0.89–1.1 (average 1/02, n=5), AL/F3L=0.94–1.36 (average 1.15, n=12), HL/ED=4–4.9 (average 4.3, n=6). Female: GZG.BST No 05022: AL=2.35, HL~1.24, SL=1, ED=0.42=GL, FW=5.1. Males: GZG. BST.03867: BL=5.1, AL=2, HL=0.8, SL=0.37, ED=0.3; MZ PAN 2177/12: FWL=5; GPI 589: BL=4.9, AL=2, HW=0.8, FWL=5.

Remarks. *Yantaromyrmex geinitzi* took the fourth rank among the most common ant species of the Late Eocene ambers after *Ctenobethylus goepperti* (Mayr, 1868), *Lasius schiefferdeckeri* Mayr, 1868 and *Formica flori* Mayr, 1868. In representative collections of Baltic amber its specimens ranged from 3.8 to 10.9% of all ants, determined to species level, in Bitterfeld amber 6.3% and in Rovno and Scandinavian 5.9%, respectively. We suggest that *Y. geintzi* was a herpetobiont, judging by the shape of body. However, in some cases, workers of this species were found with pupae and larvae. Usually, ants carry their brood in cases of exchange between nests or when they move to a new nest. Since burial of animals in resin usually occurred



Figs 7–13. *Yantaromyrmex geinitzi* (Mayr, 1868), **comb. n.**

7 – worker, lateral view of the specimen PIN 964/217a (Baltic amber); 8 – worker, head of the specimen PIN 954/230 (Baltic amber), full-face view; 9 – worker, dorsal view of the specimen CGC 3307 (Baltic amber); 10 – female, lateral view of the specimen GZG.BST.05022; 11 – male, dorsal view of the specimen GPI 589 (Baltic amber); 12 – male, forewing and hind wing of the specimen GPI 589 (Baltic amber); 13 – male, forewing of the specimen SIZK K-2886 (Rovno amber).

Рис. 7–13. *Yantaromyrmex geinitzi* (Mayr, 1868), **comb. n.**

7 – рабочий, вид сбоку, экземпляр PIN 964/217a (Балтийский янтарь); 8 – рабочий, голова экземпляра PIN 954/230 (Балтийский янтарь), вид анфас; 9 – рабочий, вид сверху, экземпляр CGC 3307 (Балтийский янтарь); 10 – самка, вид сбоку, экземпляр GZG.BST.05022; 11 – самец, вид сверху, экземпляр GPI 589 (Балтийский янтарь); 12 – самец, жилкование крыльев, экземпляр GPI 589 (Балтийский янтарь); 13 – самец, переднее крыло экземпляра SIZK K-2886 (Ровенский янтарь).

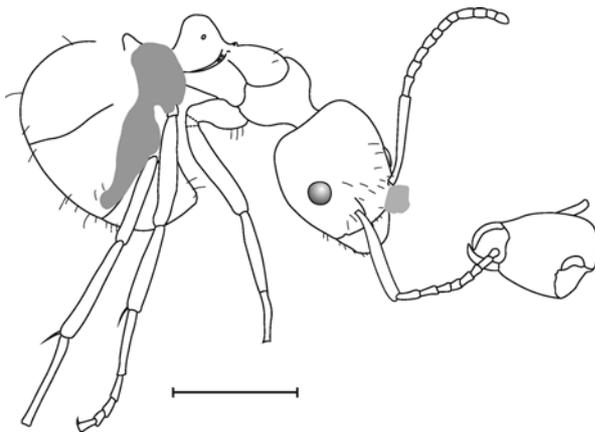


Fig. 14. *Yantaromyrmex intermedius* sp. n., holotype, worker CGC № 3301 (Bitterfeld amber).

Рис. 14. *Yantaromyrmex intermedius* sp. n., голотип, рабочий CGC № 3301 (Биттерфельдский янтарь).

on tree trunks, we can assume that at least in some cases nests of this species could be present on trees, most likely in epiphytes or dead branches. We have found workers of this species in the same piece of amber together with others species of ants such as *Ctenobethylus goepperti*, *Formica flori*, *Temnothorax gracilis* (Mayr, 1868) and *Monomorium pilipes* Mayr, 1868.

Yantaromyrmex intermedius sp. n.

(Fig. 14)

Material. Holotype, worker CGC No 3301. Bitterfeld amber, Late Eocene. Fully preserved specimen of worker, partially closed in cracks and white film.

Description. Worker. Body comparatively dense. Body length 4.5 mm. Head with slightly convex sides, with rounded occipital corners and slightly concave occipital margin. Head length is slightly more than width. Eyes offset forward, small, round and slightly convex. Maximum length of eye 5.2 times less than length of head (Fig. 14). Anterior margin of clypeus slightly convex, without or with shallow notch. Scape only reaches occipital margin of head, its length less than length of head. Segments of flagellum elongate, 1st segment of flagellum slightly longer than 2nd. Length of 1st segment 2 times, and 3rd segment 1.75 times more than thickness. Promesonotum convex in profile with weak, but quite distinct promesonotal impression. Propodeum in profile high, almost conical, with strongly convex dorsal surface which smoothly passing into slightly concave declivous surface. Legs relatively short and thick. Petiolus with scale inclined forward, its upper edge is rounded in profile. Head and mesosoma shiny, with very delicate shagreen sculpture. Clypeus with fine sculpture. Frons, cheeks and clypeus with rather numerous, short, usually straight erect hairs. Occipital corners and occipital margin of head without erect hairs. On dorsal side of mesosoma only one pair of erect hairs on mesonotum. Petiolus, scape and legs without erect hairs. Tergites and abdominal sternites with relatively rare, long curved hairs. Abdomen smooth, without (or invisible) pubescence.

Measurements. AL=1.3, HL=1, SL=0.8, ED=0.19, VL=0.47.

Remarks. A head of small worker of *C. goepperti* is clutched with antenna of *Y. intermedius* sp. n. in the inclusion (Fig. 14). This indicates that these ants were fighting when (or a little before) the worker of *Y. intermedius* sp. n. stuck in resin. *Yantaromyrmex intermedius* sp. n. gnawed the body of an enemy but could not disengage its mandibles clenched in stranglehold, judging by the damage of the

head capsule of *C. goepperti*.

Etymology. The species name is derived from Latin “intermedius” – intermediate.

Yantaromyrmex mayrianum sp. n.

(Figs 15–19)

Material. Holotype, worker GPI 447, A. Scheele collection, Baltic amber. Amber piece is glued on slide, was determined (? by G. Mayr) as *I. geinitzi*. Paratype, worker SIZK No K-6959, Rovno amber.

Description. Worker. Body length 4–5 mm. Head somewhat narrower anteriorly, with convex sides and slightly concave occipital margin. Its length slightly more than width. Eyes oval, located approximately in the middle sides of head. Maximum diameter of eye 4.6 times less than length of head. Clypeus with slightly convex anterior margin. Scape less than one-third surpassing of occipital margin of head, its length less than length of head. Profile of promesonotum weakly and uniformly convex. Mesopropodeal impression broad and shallow. Propodeum smoothly rounded, in profile its declivous surface is slightly convex. Mesopropodeal suture on sides narrow and normal structure. On head erect hairs on clypeus, on face and gular surfaces and on occipital margin. On mesosoma short erect hairs on pronotum (more than 2 pairs) and mesonotum. Upper side of femora and tibiae with sparse short erect hairs. Scape without setae or hairs, but at least with slightly raised hairs of pubescence. Erect hairs on abdomen rather numerous, short, located on whole surface of tergites and sternites. Whole body with dense pubescence, more developed on head and abdomen and more sparse on mesosoma. On abdomen length of decumbent hairs in several times more than distance between them.

Measurements. Holotype: BL=4.9, AL=1.45, HL=1.03, HW=0.97, ED=0.22, VL=0.46. Paratype: AL=1.17, HL=0.77, SL=0.75, ED=0.19, VL=0.29.

Remarks. The new species is similar to *Y. geinitzi*, from which it differs by strongly developed abundant pilosity.

Etymology. This species is named after Gustav Mayr, one of the great myrmecologists.

Yantaromyrmex samlandicus (Wheeler, 1915), comb. n.

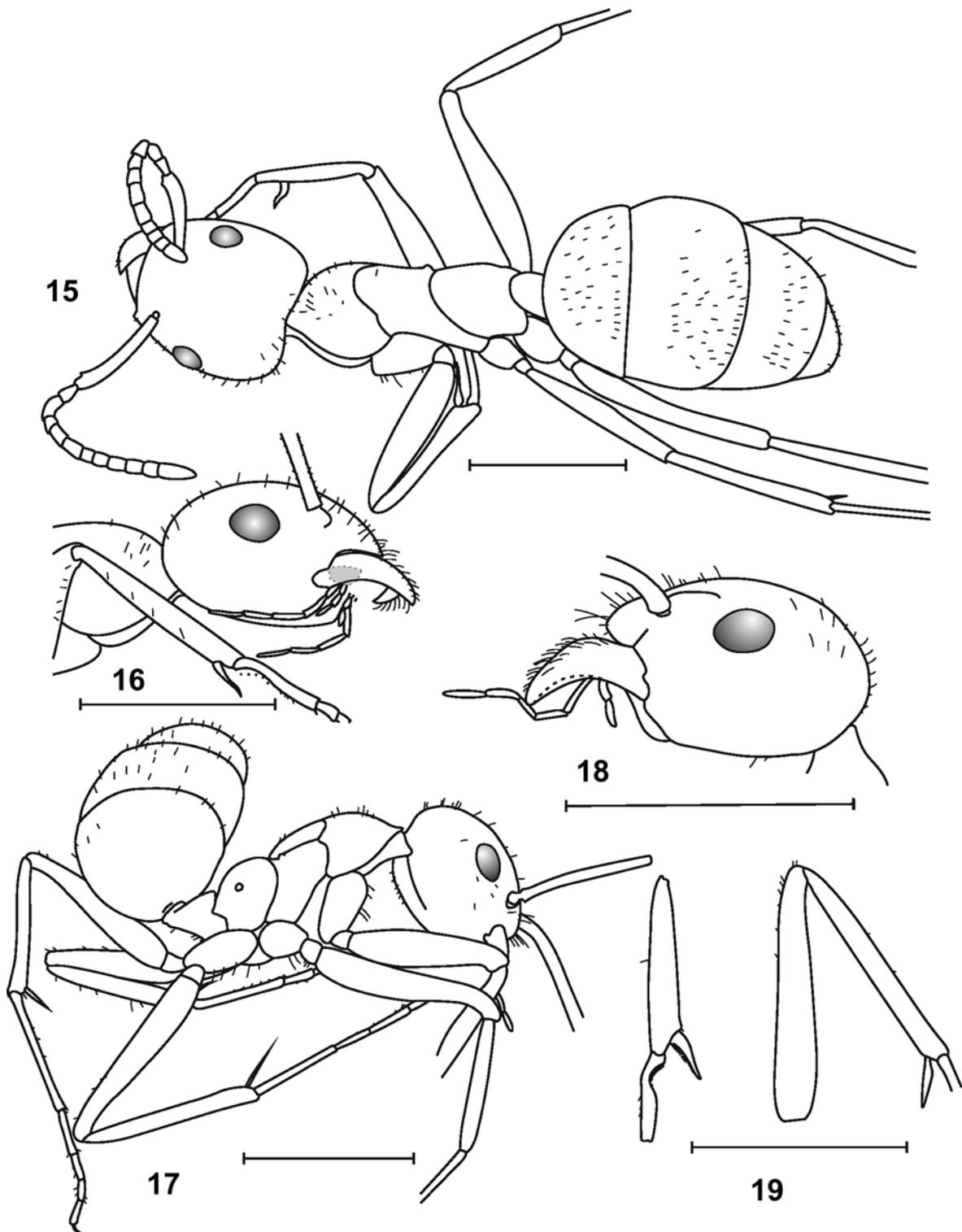
(Figs 20–22)

Types. W.M. Wheeler described this species from 82 workers, none of which were preserved. There are 3 specimens of this species in the collection of GZG, which could be regarded as syntypes. But, one of them has not been previously determined, another one was misidentified by Wheeler as *Dolichoderus balticus* and the last one was determined by him as *Iridomyrmex* sp. All of these specimens differ from the original description by more developed erect hairs (see below), and therefore we doubt that they are types. To maintain the nomenclatural stability, we propose to designate the specimen PIN No 964/236 (Fig. 20) as a neotype of *Iridomyrmex samlandicus*, which is entirely consistent with the description of W.M. Wheeler.

Type material. Neotype, worker (designated herein) PIN No 964/236, Baltic amber.

Additional material. Baltic amber: BMNH No In. 17776, In. 17786, In. 17806, 17822 (Samland), In. 22255 (Dr. H. Loew); GZG.BST No 04696 (B1422), 04744 (G94); PIN No 964/235; ZMUC No 313 (Preussien Min. Mus.). Bitterfeld amber: HMC No 16.206; GZG.BST (GCG.BST (MKC)) No 27.144; CGC No 3301. Rovno amber: SIZK No K-265, K-635, K-795, K-27434 (2 workers), K-27435.

Description. Worker. Body comparatively dense. Body length 4–6 mm. Head somewhat narrower anteriorly, with convex sides and slightly concave occipital margin. Its length is approximately

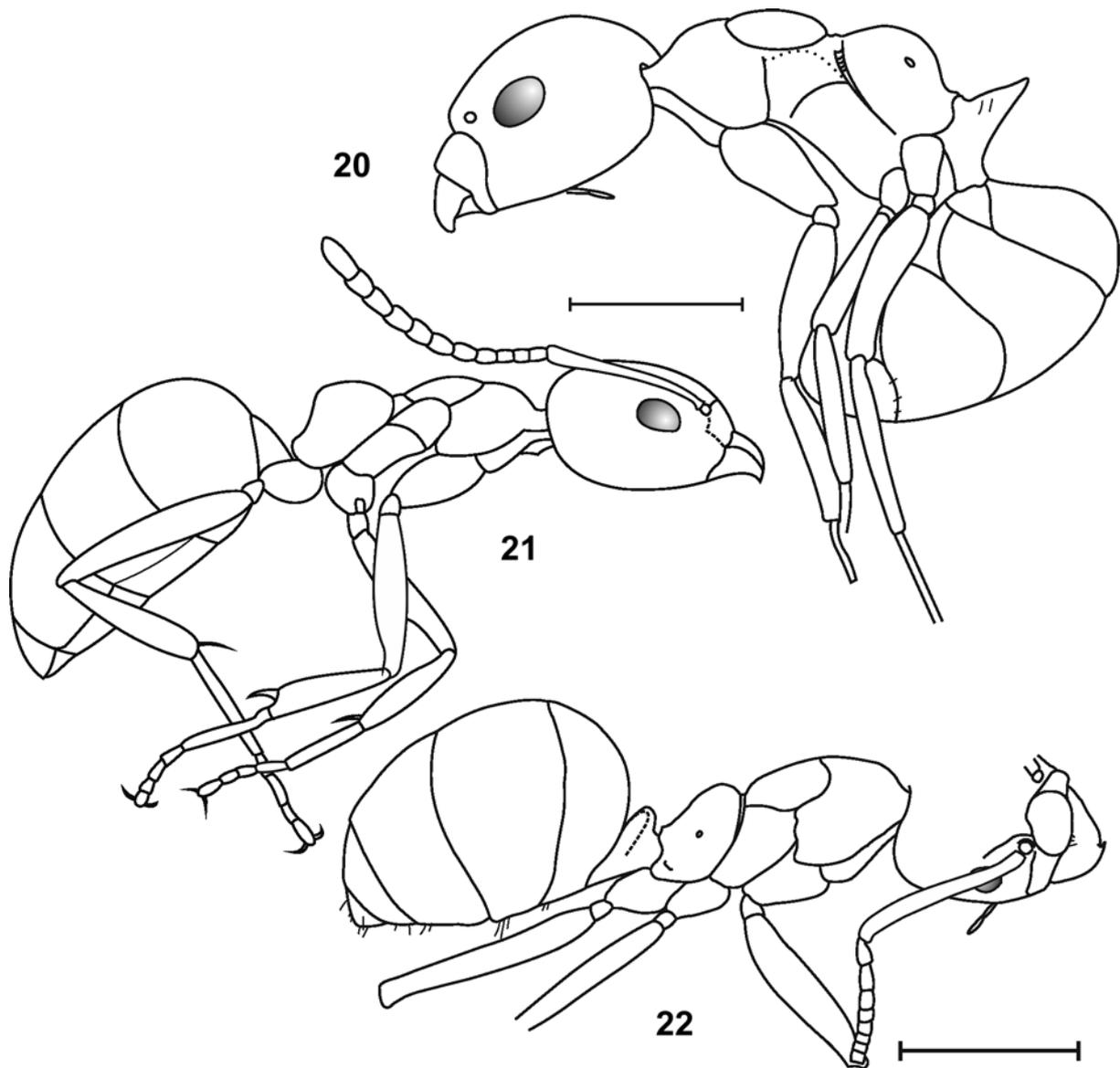


Figs 15–19. *Yantaromyrmex mayrianum* sp. n.

15 – holotype GPI 447 (Baltic amber), worker, dorsal view; 16 – holotype GPI 447 (Baltic amber), worker, head and pronotum, lateral view; 17 – paratype SIZK № K-6959 (Rovno amber), worker, lateral view; 18 – paratype SIZK № K-6959 (Rovno amber), worker, head, lateral view; 19 – paratype SIZK № K-6959 (Rovno amber), worker, pretarsus and tibia (foreleg), femur and tibia (hind leg).

Рис. 15–19. *Yantaromyrmex mayrianum* sp. n.

15 – голотип GPI 447 (Балтийский янтарь), рабочий, вид сверху; 16 – голотип GPI 447 (Балтийский янтарь), рабочий, голова и промезонотум, вид сбоку; 17 – паратип SIZK K-6959 (Ровенский янтарь), рабочий, вид сбоку; 18 – паратип SIZK K-6959 (Ровенский янтарь), рабочий, голова, вид сбоку; 19 – паратип SIZK K-6959 (Ровенский янтарь), рабочий, предлапка и голень (передняя нога), бедро и голень (задняя нога).



Figs 20–22. *Yantaromyrmex samlandicus* (Wheeler, 1915), **comb. n.**
 20 – neotype PIN № 964/236 (Baltic amber), worker, lateral view; 21 – worker, lateral view (redrawn from Wheeler [1915]); 22 – worker GZG.BST.27.144 (Bitterfeld amber), lateral view.

Рис. 20–22. *Yantaromyrmex samlandicus* (Wheeler, 1915), **comb. n.**
 20 – неотип PIN № 964/236 (Балтийский янтарь), рабочий, вид сбоку; 21 – рабочий, вид сбоку (перерисован из Wheeler [1915]); 22 – рабочий GZG.BST.27.144 (Биттерфельдский янтарь), вид сбоку.

equal or slightly more than width. Eyes oval, slightly offset forward. Maximum diameter of eye 4–5 times less than length of head. Anterior margin of clypeus with a small notch in the middle. Scape slightly over protruding of occipital margin of head, its length less than head length (HL/SL=1.1–1.25). Segments of flagellum elongated. Length of 1st segment 2 times, and 2nd and 3rd 1.5 times longer than thickness. Promesonotum convex in profile with very weak promesonotal impression. Mesopropodeal impression comparatively narrow and deep. Mesopropodeal suture on sides wide and deep, with sculpture of transverse wrinkles. Propodeum in profile is angular, its dorsal surface is convex, and declivous surface slightly concave or straight, length of dorsal surface is approximately equal to declivous. Legs relatively short and thick. Length of hind femur 1.3–1.8 times less than length of mesosoma. Head and mesosoma shiny, finely punctate with shagreen sculpture. Abdomen with fine shagreen sculpture. Clypeus finely striate. Erected pubescence varies. On less pubescent specimens

erected hairs only on posterior margin of abdominal sternites 1–4, on entire surface of the last sternum, on anterior margin of clypeus and coxae. Occipital margin and occipital angles of head, legs and scape always without erect hairs. In some specimens accumbens pubescence of rare and very short hairs on head and abdominal tergites.

Measurements. PIN No 965/236 (neotype): AL=1.8, HL=1.4, ED=0.28, VL=0.5; GZG.BST No 04744: AL=1.7, HL=1.2, HW=1.16, SL=1, ED=0.26, VL=0.41; PIN No 964/235: AL=1.7, HL=1.25; HW=1.1, SL=1, ED=0.30, VL=0.5; ZMUC No 313: AL=1.8, HL=1.4, ED=0.38, VL=0.45; GZG.BST No 27.144: AL=1.52, SL=1.02, ED=0.23, VL=0.4; SIZK No 27434: AL=1.39, HL=1.2, HW=0.99, SL=1.12, ED=0.28, VL=0.45.

Remarks. In the description *Iridomyrmex samlandicus* Wheeler [1915] wrote: “Pilosity feebly developed; erect hairs lacking on the upper surface of the body, including the

gaster, sparse on the venter, coxae, mandibles and clypeus: appendages, except the tips of the scapes and femora, without erect hairs". The neotype (PIN No 965/236) and most of the studied specimens correspond to the original description and they are almost totally deprived of erect pubescence.

**Key to species of the genus *Yantaromyrmex* gen. n.
based on workers
(females and true males are known only in *Y. geinitzi*)**

1. Mesopropodeal impression deep and distinct. Mesopropodeal suture on sides wide and deep, with sculpture of transverse wrinkles (Figs 3, 4, 14). Propodeum in profile angular, with rounded corner 2
 - Mesopropodeal suture has normal structure. Mesopropodeal impression broad and shallow (Figs 7, 17). Propodeum smoothly rounded in profile 4
2. Body with numerous erect hairs on dorsal side (Fig. 4). Scape and legs always bearing erect hairs *Y. constrictus* (Mayr)
 - Usually only a few erect hairs on dorsal side of head and mesosoma. Scape and legs always without erect hairs 3
3. Maximum length of eye 5 times less than length of head. Propodeum is low with pronounced concave declivous surface (Figs 20, 21). Scape surpassing of occipital margin of head more than own maximum diameter *Y. samlandicus* (Wheeler)
 - Maximum diameter of eye more than 5 times as short as head. Propodeum tall, conical (Fig. 14). Scape does not reach occipital margin of head *Y. intermedius* sp. n.
4. Dorsum of head with a few erect hairs, occipital margin of head without erect hairs, dorsal side of mesosoma without erect hairs or with 1–2 pairs on pronotum, only last segments of abdomen have erect hairs. Scape and legs without erect hairs *Y. geinitzi* (Mayr)
 - Entire body except propodeum in quite numerous erect

hairs, which also cover occipital margin and ventral side of head and legs. On mesonotum short erect hairs, on abdomen erect hairs on all segments (Figs 15–17) ...
..... *Y. mayrianum* sp. n.

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