

Two new species of the genera *Caenophanes* Foerster, 1862 and *Neurocrassus* Šnoflak, 1945 (Hymenoptera: Braconidae) from the Afrotropical Region

Два новых вида из родов *Caenophanes* Foerster, 1862 и *Neurocrassus* Šnoflak, 1945 (Hymenoptera: Braconidae) из Афротропической области

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Ключевые слова: Hymenoptera, Braconidae, Doryctinae, *Caenophanes*, *Neurocrassus*, паразитоиды, новые виды, новая комбинация, афротропический регион.

Abstract. Two new species of the genera *Caenophanes* Foerster, 1862, *Caenophanes* (*Caenophanes*) *dluskyi* sp. n., and *Neurocrassus* Šnoflak, 1945, *N. africanus* sp. n., from the Democratic Republic of Congo and Republic of Côte d'Ivoire are described and illustrated. The new combination *Neurocrassus transversalis* (Szépligeti, 1914), **comb. n.** is given.

Резюме. Описываются и иллюстрируются два новых вида из родов *Caenophanes* Foerster, 1862, *Caenophanes* (*Caenophanes*) *dluskyi* sp. n., и *Neurocrassus* Šnoflak, 1945, *N. africanus* sp. n., из Демократической Республики Конго и Республики Кот-д'Ивуар. Дается новая комбинация *Neurocrassus transversalis* (Szépligeti, 1914), **comb. n.**

Afrotropical parasitoids of the family Braconidae have been extensively studied by numerous hymenopterists [Yu et al., 2012]. However, the species diversity of the parasitoid taxa in the African region is far from being completely known.

The aim of this paper is to document the presence of the doryctine genera *Caenophanes* Foerster, 1862 and *Neurocrassus* Šnoflak, 1945 for the Afrotropical Region, and describe two new species of these genera from Democratic Republic of Congo and Republic of Côte d'Ivoire.

Material and methods

The studied material was selected from the collection of the Musée Royal de l'Afrique Centrale (Tervuren, Belgium; MRAC). Specimens were examined using a MC-2 stereomicroscope. The images were taken with a Leica IC 3D digital camera mounted on a Leica® MZ16 microscope and using the Leica Application Suite® imaging system (Museum and Institute of Zoology, Warsaw, Poland). The

terminology employed in this work for the morphological features and measurements follows Belokobylskij and Maetô [2009]. The wing venation nomenclature follows Belokobylskij and Maetô [2009] and Sharkey and Wharton [1997] in parentheses. The holotypes of both new species are deposited in the collection of Musée Royal de l'Afrique Centrale (Tervuren, Belgium), one paratype in the collection of Zoological Institute of the Russian Academy of Sciences (St. Petersburg, Russia; ZISP).

Genus *Caenophanes* Foerster, 1862

Type species *Bracon incompletus* Ratzeburg, 1844.

The genus *Caenophanes* Foerster, 1862 is a small taxon with about 20 described species from the Palaearctic [Belokobylskij, Maetô, 2006, 2009; Belokobylskij et al., 2011], Oriental [Belokobylskij, 1993], Australasian [Belokobylskij et al., 2004; Belokobylskij, 2010], Nearctic [Haimowitz et al., 2014] and Neotropical [Marsh, 2014] regions. This genus was also recorded from the Afrotropical Region [Zaldivar-Riverón et al., 2008], but without species determination.

Caenophanes is divided into two subgenera [Belokobylskij, 2010]. The nominative subgenus *Caenophanes* s. str. (with type species *Bracon incompletus* Ratzeburg, 1844) has an almost worldwide distribution and includes most of the described species. The second subgenus, *Pacificophanes* Belokobylskij, 2010 (with type species *Caenophanes baloghi* Belokobylskij, 2010), is known exclusively from New Caledonia.

Some species of *Caenophanes* have been reared from xylophagous and bark-borer beetle larvae belonging to species of the coleopteran families Cerambycidae, Curculionidae (including Scolytinae) and Buprestidae [Belokobylskij et al., 2011].

Caenophanes (Caenophanes) dlusskyi Belokobylskij, **sp. n.**
(Color plate 15: 1–10)

Material. Holotype, ♀: "Coll. Mus. Congo, N. Lac Kiwu: Rwankwi, XII – 1951, J.V. Leroy" (MRAC).

Description. Female. Body length 2.1 mm; fore wing length 2.2 mm.

Head not depressed, its width 1.7 times median length, 1.3 times width of mesoscutum. Head behind eyes (dorsal view) distinctly roundly narrowed. Transverse diameter of eye 1.7 times longer than temple (dorsal view). Ocelli small, forming equilateral triangle. POL about 2 times Od, 0.3 times OOL. Diameter of antennal socket almost equal to distance between sockets, about twice distance between socket and eye. Eyes glabrous, without emargination opposite antennal sockets, 1.1 times as high as broad. Malar space height 0.6 times height of eye, almost equal to basal width of mandible. Face convex, its width 1.3 times height of eye and 1.2 times height of face and clypeus combined. Malar suture absent. Clypeus with distinct lower flange. Hypoclypeal depression rather small and round, its width 0.7 times distance from edge of depression to eye, 0.4 times width of face. Occipital carina dorsally distinct and complete, ventrally joining with hypostomal carina upper base of mandible. Head below eyes (front view) distinctly and roundly narrowed. Hypostomal flange narrow.

Antennae slender, filiform, more than 17-segmented (apical segments missing). Scape rather short and wide, 1.5 times longer than its maximum width. First flagellar segment slender, almost straight, subcylindrical, 8.5 times longer than its apical width, 1.1 times longer than second segment. Subapical segments about 6 times longer than their width.

Mesosoma not depressed, its length 1.9 times maximum height. Pronotum rather long, convex dorsally (lateral view), anteriorly with short convex flange. Mesoscutum highly and roundly elevated above pronotum, maximum width of mesoscutum 1.1 times its length. Median lobe of mesoscutum protruding forwards, without anterolateral corners, distinctly convex anteriorly (dorsal view). Notauli narrow, deep, crenulate. Prescutellar depression deep, long, with median carina, sparsely and distinctly crenulate and with very fine granulation, 0.25 times as long as scutellum. Scutellum distinctly convex, with lateral carinae, its maximum width almost equal to median length. Subalar depression distinct, wide, mainly smooth. Sternaulus rather deep, straight, oblique, rugulose-crenulate, running along anterior half of lower part of mesopleuron. Metanotal tooth absent. Metapleural lobe short, narrow, rounded apically. Propodeum (lateral view) distinctly and convex-roundly narrowed from base to apex (lateral view), with two distinct lateral and low tubercles; propodeal spiracle small.

Wings. Fore wing 3.5 times longer than its maximum width, 1.1 times longer than body. Pterostigma 4.7 times longer than wide. Radial vein (r) arising from middle of pterostigma. Radial (marginal) cell not shortened. Metacarp (R1) 1.3 times longer than pterostigma. First radial abscissa (r) almost as long as maximum width of pterostigma. Second radial abscissa (3RSa) 2.3 times longer than first abscissa (r), 0.45 times as long as the straight third abscissa (3RSb), almost as long as the trace of first radiomedial vein (2RS). Trace of first radiomedial vein (2RS) 2.3 times longer than second radiomedial vein (r-m), 2.7 times longer than recurrent vein (m-cu). First medial abscissa ((RS+M)a) weakly sinuate. Discoidal (first discal) cell 1.6 times longer than wide. Basal (1M) and recurrent (m-cu) veins divergent posteriorly. Distance from nervulus (cu-a) to basal vein (1M) almost equal to nervulus (cu-a) length; nervulus (cu-a) straight and perpendicular to anal vein (1-1A). Mediocubital vein (M+CU) weakly curved. Parallel vein (2CUb) interstitial. Brachial (first subdiscal) cell apically roundly closed weakly before recurrent vein (m-cu). Hind wing 5.1 times longer than wide. First abscissa of costal vein (C+Sc+R) 0.5 times as long as second abscissa (Sc+R); second abscissa (Sc+R) strongly sclerotised. Radial vein (RS) very strongly desclerotised. Medial (basal) cell narrow, but widened distally, its length 6.5 times longer than maximum width, 0.4 times length of wing. First abscissa of

mediocubital vein (M+CU) 0.4 times as long as second abscissa (1M). Recurrent vein (m-cu) weakly sclerotised, short, distinctly curved, distinctly antefurcal.

Legs. Fore tibia with several slender spines arranged almost in single line on inner surface. Hind coxa 1.5 times longer than its maximum width, with distinct basoventral tubercle. Hind femur thick, without dorsal protuberance, 3.7 times longer than wide. Hind tarsus 0.9 times as long as hind tibia. Hind basitarsus 0.8 times as long as second–fifth segments combined. Second tarsal segment 0.35 times as long as basitarsus, 1.2 times longer than fifth segment (without pretarsus).

Metasoma 0.8 times as long as head and mesosoma combined, 2.4 times longer than its maximum width. First tergite with short acrosternite, with convex median area, with distinct dorsope, dorsal carinae complete and curved, spiracular tubercles indistinct, spiracles present in basal third; tergite distinctly and linearly widened from base to apex. Maximum width of first tergite 2.3 times its minimum width; length of tergite 1.2 times its apical width, 1.25 times length of propodeum. Second tergite without lateral furrows. Suture between second and third tergites absent. Combined length of second and third tergites 0.9 times basal width of second tergite, 0.8 times their maximum width. Third tergite without transverse furrow. Ovipositor sheath 0.9 times as long as metasoma, 0.9 times as long as mesosoma, 0.4 times as long as fore wing.

Sculpture and pubescence. Head entirely smooth. Sides of pronotum densely and finely rugulose-reticulate, median oblique depression crenulate. Mesoscutum and scutellum densely and distinctly granulate, mesoscutum with single undulate longitudinal median carina in posterior 0.4 and short rugosity around it. Mesopleuron entirely smooth. Metapleuron rather sparsely and finely rugulose. Propodeum with areas distinctly delineated by carinae, basolateral areas large and reticulate-granulate, finely reticulate to almost smooth in anterior quarter; basal carina 3 times longer than anterior fork of areola; areola narrow and short; petiolate area subsquare; posterior part of propodeum rugose-reticulate. Hind coxae smooth, finely granulate in dorsobasal quarter. Hind femur densely and finely aciculate dorsally, mainly almost smooth. First tergite distinctly and densely striate, with dense reticulation between striae. Second tergite in basal 0.7 distinctly and mainly obliquely striate with reticulation, smooth on rest part. Remaining tergites entirely smooth. Vertex with long sparse and almost erect setae, glabrous in wide medioanterior area. Mesoscutum almost entirely with short and semi-erect pale setae, setae sparse anteriorly. Metapleuron glabrous. Hind tibia dorsally with medium length, rather sparse and semi-erect setae; length of these setae 0.6–0.9 times maximum width of hind tibia.

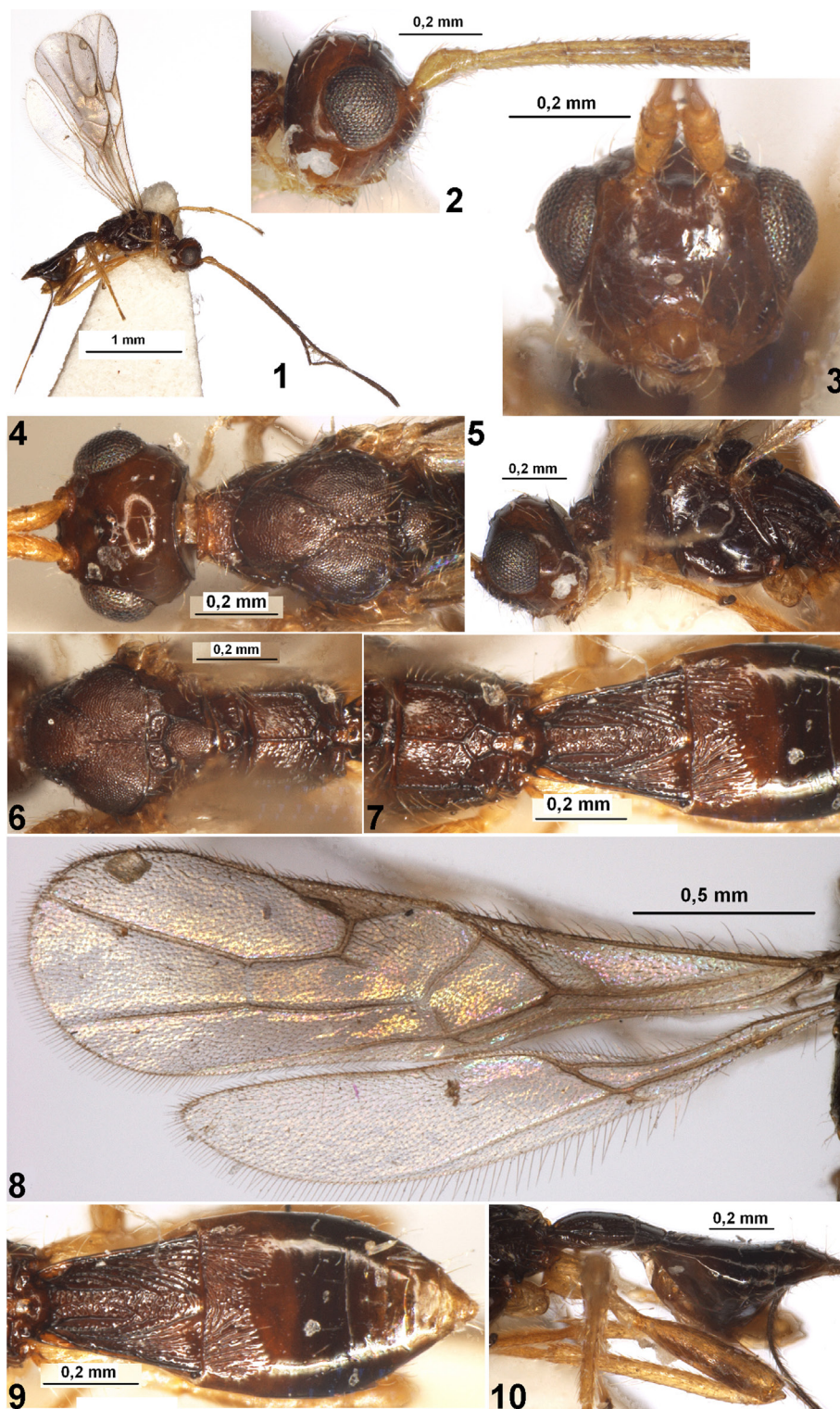
Colour. Body reddish brown to dark reddish brown, with some black spots. Antenna brown to dark brown, four basal segments yellow to brownish yellow. Palpi yellow. Legs brownish yellow, hind femur mainly reddish brown. Ovipositor sheath almost black. Fore wing faintly infusate, more distinctly along veins. Pterostigma light brown, paler basally and apically.

Male. Unknown.

Distribution. Congo.

Etymology. This species is named after the recently deceased famous Russian hymenopterist and myrmecologist, Professor of the Moscow State University, Gennady Mikhailovich Dlussky.

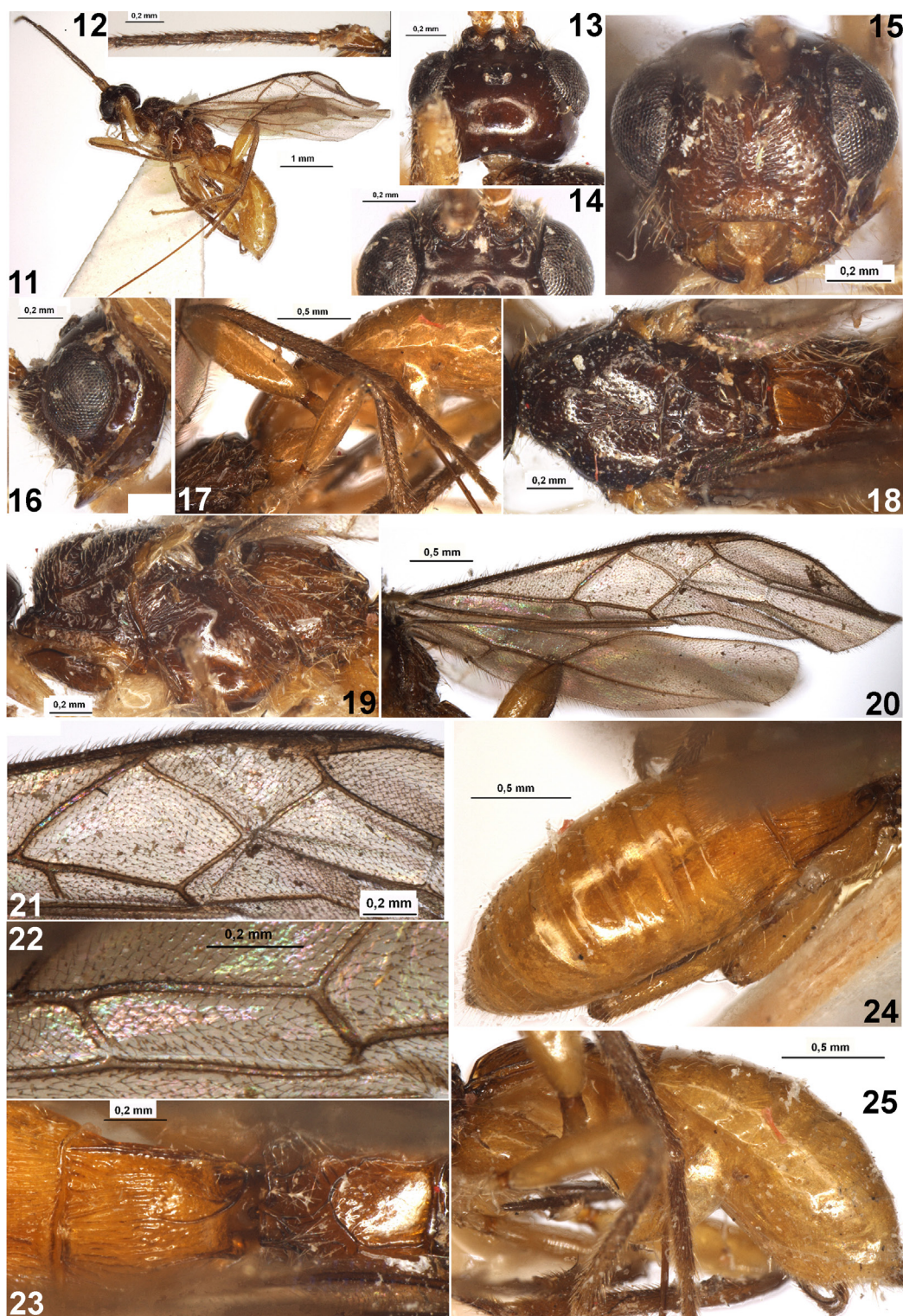
Comparative diagnosis. This new species belongs to the group of species with shortened submedial (subbasal) cell of hind wing and crenulate sternaulus [Belokobylskij et al., 2011]. *Caenophanes dlusskyi* **sp. n.** distinctly differs from all known species of the genus by the following combination of characters: vertex and frons entirely smooth (Color plate 15: 2–5), the first flagellar segment very long and slender, not shorter than second flagellar segment (Color plate 15: 2), ocelli in an equilateral triangle (Color plate 15: 4), and areola of propodeum short, wider than median length (Color plate 15: 7).

Figs 1–10. *Caenophanes* (*Caenophanes*) *dluskyi* sp. n., female.

1 – body, lateral view; 2 – head and basal part of antenna, lateral view; 3 – head, front view; 4 – head and mesoscutum, dorsal view; 5 – head and mesosoma, lateral view; 6 – mesosoma, dorsal view; 7 – propodeum and first to third metasomal tergites, dorsal view; 8 – fore and hind wings; 9 – metasoma, dorsal view; 10 – metasoma and hind leg, lateral view.

Рис. 8–10. *Caenophanes* (*Caenophanes*) *dluskyi* sp. n., самка.

1 – тело, вид сбоку; 2 – голова и базальная часть антенны, вид сбоку; 3 – голова, вид спереди; 4 – голова и мезоскутум, вид сверху; 5 – голова и мезосома, вид сбоку; 6 – мезосома, вид сверху; 7 – проподоум и 1–3-й тергиты метасомы, вид сверху; 8 – переднее и заднее крылья; 9 – метасома, вид сверху; 10 – метасома и задняя нога, вид сбоку.

Figs 11–25. *Neurocrassus africanus* sp. n., female.

11 – body, lateral view; 12 – basal segments of antenna; 13 – head, dorsal view; 14 – frons; 15 – head, front view; 16 – head, lateral view; 17 – hind leg; 18 – mesosoma, dorsal view; 19 – mesosoma, lateral view; 20 – fore and hind wings; 21 – median part of fore wing; 22 – brachial (first subdiscal) cell of fore wing; 23 – propodeum and first metasomal tergite, dorsal view; 24 – metasoma, dorsal view; 25 – metasoma, lateral view.

Рис. 11–25. *Neurocrassus africanus* sp. n., самка.

11 – тело, вид сбоку; 12 – базальные членики антенны; 13 – голова, вид сверху; 14 – лоб; 15 – голова, вид спереди; 16 – голова, вид сбоку; 17 – задняя нога; 18 – мезосома, вид сверху; 19 – мезосома, вид сбоку; 20 – переднее и заднее крылья; 21 – средняя часть переднего крыла; 22 – брахиальная (первая субдискальная) ячейка переднего крыла; 23 – пропodeум и первый тергит брошка, вид сверху; 24 – метасома, вид сверху; 25 – метасома, вид сбоку.

Genus *Neurocrassus* Šnoflak, 1945

Type species *Neurocrassus tesari* Šnoflak, 1945.

Genus *Neurocrassus* Šnoflak, 1945 contains 16 described species occurring in the Palaearctic and Oriental zoogeographical regions [Belokobylskij, Maetô, 2009; Yu et al., 2012]. An undescribed species of this genus has been recorded in North America [Whitfield, 1988]. Described from tropical Africa (Equatorial Guinea), *Neodoryctes transversalis* Szépligeti [Szépligeti, 1914] (lectotype from Museum für Naturkunde an der Humboldt-Universität (Berlin, Germany) was studied: female, "Sp. G., Makomo, Alcu, Benitogbt, 1-15 X [19]06, G. Tessmann S. G., "463", "Neodoryct. transversalis Sz." (handwriting by Szépligeti)) actually belongs to *Neurocrassus* (*Neurocrassus transversalis* **comb. n.**) on the basis of the presence of upper tentorial pits, structure of the second metasomal tergite, and pattern of the head colour. Some species of *Neurocrassus* have been reared from xylophagous beetle larvae of the families Cerambycidae and Curculionidae [Belokobylskij, Maetô, 2009].

Described below a new Afrotropical species of *Neurocrassus* belongs to the morphological group characterised by the presence of smooth and more or less distinctly delineated basomedian area on the second tergite (Color plate 16: 23), very small upper tentorial pits (Color plate 16: 14) and the absence of a sclerotised area on the fore wing of male (unknown for this species).

Neurocrassus africanus Belokobylskij, **sp. n.**
(Color plate 16: 11–25)

Material. Holotype, ♀: "Coll. Mus. Congo, Tshuapa: Ikela, 1955, R.R. Lootens" (MRAC). Paratype: 1♀, "Coll. Mus. Tervuren, Côte d'Ivoire: Man, J. Decelle, 30-VIII-1962" (ZISP).

Description. Female. Body length 5–5.4 mm, fore wing length 3.9–4.1 mm.

Head width (dorsal view) 1.3–1.5 times its median length, 1.2–1.3 times width of mesoscutum. Frons without carina, with wide shallow smooth of rugulose median depression in anterior third. Head behind eyes (dorsal view) weakly convex anteriorly, roundly narrowed posteriorly; transverse diameter of eye 1.4 times longer than temple. Ocelli medium-sized, arranged in triangle with base 1.1 times its sides. POL almost equal to Od, 0.3–0.35 times OOL. Eye glabrous, with very shallow emargination opposite antennal socket, 1.2 times as high as broad. Malar space 0.4–0.45 times height of eye, 0.75–0.8 times basal width of mandible. Face along eyes without distinct carinae, with two subround depressions above clypeus; width of face 1.1–1.2 times height of eye and 1.1–1.2 times height of face and clypeus combined. Malar suture absent. Hypoclypeal depression round, its width almost equal to distance from edge of depression to eye, 0.45 times width of face. Occipital carina below not joined with hypostomal carina obliterating at short distance upper base of mandible.

Antennae rather slender, almost filiform, more than 27-segmented (apical segments missing). Scape 1.8–1.9 times longer than its maximum width. First flagellar segment 5–5.2 times longer than its apical width, 1.5–1.6 times longer than second segment. Subapical segments about 3.3 times longer than their width.

Mesosoma. Length 1.7–1.8 times its height. Pronotum slightly convex dorsally (lateral view) and with pronotal carina in anterior 0.3. Mesoscutum (dorsal view) almost as wide as median length. Median lobe of mesoscutum (dorsal view) distinctly protruding forward, without median furrow. Notauli rather deep

anteriorly and shallow posteriorly, wide, crenulate. Prescutellar depression deep, with distinct median carina, finely and sparsely rugulose-striate, medially 0.25–0.3 times as long as scutellum. Scutellum convex, without lateral carinae. Metanotum with two strongly convergent posteriorly and fused lateral carinae and with weak median carina (dorsal view); with weak and obtuse metanotal tooth (lateral view). Subalar depression rather shallow, wide, not strongly rugulose-striate. Sternaulus shallow anteriorly, with distinct oval depression in posterior 0.4, almost straight, smooth, running along anterior 0.5–0.6 of lower part of mesopleuron. Metapleural flange long, wide, rounded apically. Propodeum with short and thick lateral tubercles.

Wings. Fore wing 3.5–3.8 times longer than its maximum width. Radial vein (r) arising behind middle of pterostigma, its inner anterior side 1.25–1.3 times longer than inner posterior side. Radial (marginal) cell not shortened; metacarp (R1) 1.3–1.5 times longer than pterostigma. First radial abscissa (r) 0.6–0.8 times as long as maximum width of pterostigma. Second radial abscissa (3RSa) 2.8–2.9 times longer than first abscissa (r), about 0.4 times as long as the straight third abscissa (3RSb), 1.1–1.2 times longer than first radiomedial vein (2RS). Second radiomedial (second submarginal) cell 2.1–2.4 times longer than its maximum width, 1.2–1.3 times longer than brachial (first subdiscal) cell. First medial abscissa ((RS+M)a) weakly sinuate. Mediocubital vein (M+CU) not curved posteriorly. Recurrent vein (1m-cu) 7–10 times longer than second abscissa of medial vein ((RS+M)b). Nervulus (1cu-a) straight, distance from nervulus (1cu-a) to basal vein (1M) 0.9–1.3 times nervulus (1cu-a) length. Parallel vein (2CUb) arising from posterior 0.3 of distal margin of brachial (first subdiscal) cell. Hind wing 4.6–4.8 times longer than its maximum width. First costal abscissa (C+SC+R) 0.6–0.7 times as long as second abscissa (SC+R). First abscissa of mediocubital vein (M+CU) 1.3–1.5 times longer than second abscissa (1M). Radial (marginal) cell subparallel, without transverse vein (r). Mediocubital (basal) cell large, widened toward apex, 6.5–7.5 times longer than wide, 0.45 times as long as wing. Recurrent vein (m-cu) straight, oblique, antefurcal, distinctly pigmented.

Legs. Fore tibia with numerous short spines arranged in narrow vertical stripe. Hind coxa 1.3–1.5 times longer than wide. Hind femur 3.4–3.5 times longer than wide. Hind tarsus 0.9 times as long as hind tibia. Hind basitarsus 0.6–0.7 times as long as second–fifth segments combined. Second segment of hind tarsus 0.45–0.5 times as long as basitarsus, 1.1–1.2 times longer than fifth segment (without pretarsus).

Metasoma 1–1.1 times as long as head and mesosoma combined. First tergite with very small spiracular tubercles, spiracles situated in basal 0.3, distinctly and weakly roundly widened from base to apex. Maximum width of first tergite 1.8–2 times its minimum width; length 0.9–1.1 times its apical width. Second tergite with rather small and not delineated by furrow semi-round basomedian area; length of tergite 0.45–0.5 times its basal width, 0.8–0.9 times length of third tergite. Combined length of second and third tergites as long as basal width of second tergite. Second suture distinct, shallow, almost straight. Third tergite in basal 0.3 with weak complete smooth transverse furrow. Ovipositor sheath 0.35–0.4 times as long as body, 0.65–0.7 times as long as metasoma, 1.1 times longer than mesosoma, 0.45–0.5 times as long as fore wing.

Sculpture and pubescence. Head mainly smooth, face rugulose in median area and sparsely punctate to smooth laterally. Sides of pronotum smooth on wide space, rugulose posteriorly on narrow area, submedian depression finely crenulate, but more distinctly crenulate anteriorly. Mesoscutum almost smooth, with weak and sparse punctation, narrowly rugulose with two convergent carinae in medioposterior half. Scutellum and mesopleuron mainly smooth. Propodeum with distinct areas delineated by high carinae; basolateral areas large, mostly smooth, but sometimes shortly rugose along carinae; areola medium-

sized and rather wide, almost as long as wide; petiolate area rather long; basal carina long, almost as long as anterior fork of areola; posterior half of propodeum rugose or rugulose. Hind coxa almost smooth, with weak and sparse punctation partly. Hind femur almost entirely smooth, additionally with fine and sparse punctation. First tergite with distinct, complete and weakly sinuate dorsal carinae, entirely striate, smooth in basomedian 0.25. Second tergite entirely, densely and more or less linearly obliquely striate, partly with very fine rugosity between striae, smooth in small basomedian area. Remaining tergites smooth. Vertex glabrous or almost glabrous on wide median area, with short and sparse setae laterally. Mesoscutum entirely with dense, short and semi-erect pale setae. Hind tibia dorsally with short, very dense and semi-erect pale setae, length of these setae 0.4–1 times maximum width of hind tibia.

Colour. Head dark reddish brown. Mesosoma dark reddish brown in anterior half and reddish brown in posterior half, prothorax yellowish brown in lower half; in paratype mainly light reddish brown or yellowish brown. Metasoma brownish yellow or almost yellow, faintly darker basally. Antennae dark brown to black, scape in basal half or entirely yellow or brownish yellow. Palpi pale yellow. Legs brownish yellow, fore coxa paler, tibiae (especially hind) and tarsi brown or partly light reddish brown, base of hind tibia entirely dark. Ovipositor sheath almost black. Fore wing distinctly infusate. Pterostigma entirely brown.

Male. Unknown.

Distribution. Congo, Côte d'Ivoire.

Etymology. This species is named after the African continent, where this species was collected.

Comparative diagnosis. This new species is very similar to Eastern Palaearctic – Oriental *N. pseudopallipes* Belokobylskij et Maetô, 2009 (Japan, China), but differs from it in having the metasoma entirely brownish yellow (mainly black or dark brown in *N. pseudopallipes*), sides of pronotum smooth on wide space (almost entirely coarsely rugose in *N. pseudopallipes*), POL subequal to Od (1.2–1.5 times larger in *N. pseudopallipes*), second radial abscissa (3RSa) 0.4 times as long as third abscissa (3RSb) (0.5–0.6 times in *N. pseudopallipes*), recurrent vein (1m-cu) 7–10 times longer than second abscissa of medial vein ((RS+M)b) (3–4 times in *N. pseudopallipes*), hind femur 3.4–3.5 times longer than wide (3–3.2 times in *N. pseudopallipes*), basal carina of propodeum almost as long as anterior fork of areola (1.5–2 times in *N. pseudopallipes*), vertex almost glabrous on wide median area (entirely densely setose in *N. pseudopallipes*), basal area of hind tibia entirely dark (widely pale yellow in subbasal half in *N. pseudopallipes*), and pterostigma entirely brown (pale yellow in basal 0.3 and apically in *N. pseudopallipes*).

Differences between Afrotropical species *N. transversalis* and *N. africanus* sp. n. are showed in the key below:

1. Face along eyes with distinct carinae. First flagellar segment 1.2 times longer than second segment. Length of mesosoma 1.6 times its height. Hind femur 3.9 times longer than wide. Ovipositor sheath 1.15 times as long as metasoma, 0.8 times as long as fore wing. Areola of propodeum almost twice as long as wide; basal carina 2.5 times as long as anterior fork of areola. Body length 7.6 mm *N. transversalis*
- Face along eyes without distinct carinae (Color plate 16: 15). First flagellar segment 1.5–1.6 times longer than second segment (Color plate 16: 12).

Length of mesosoma 1.7–1.8 times its height (Color plate 16: 19). Hind femur 3.4–3.5 times longer than wide (Color plate 16: 17). Ovipositor sheath 0.65–0.7 times as long as metasoma, 0.45–0.5 times as long as fore wing (Color plate 16: 25). Areola of propodeum almost as long as wide; basal carina almost as long as anterior fork of areola (Color plate 16: 23). Body length 5–5.4 mm *N. africanus* sp. n.

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