

Nanophryodotus gen.n. from South Africa, with three new species (Coleoptera: Curculionidae: Hipporhinini)

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Abstract

Nanophryodotus gen.n. (Coleoptera: Curculionidae: Cyclominae: Hipporhinini), and three new species from South Africa (Northern Cape, Western Cape), *N. cerula* sp.n., *N. angusticollis* sp.n., and *N. romani* sp.n., are described. The new genus is closely related to *Ophryodotus* PASCOE, 1887. A key to the species of *Nanophryodotus* is provided.

Key words: Coleoptera, Curculionidae, Cyclominae, Hipporhinini, taxonomy, new genus, new species, South Africa.

Introduction

The Hipporhinini, a tribe of the subfamily Cyclominae SCHOENHERR, 1836, were established by LACORDAIRE (1863). Later, OBERPRIELER (1995, 2010, 2014) reassembled and redefined the subfamily delimiting the Hipporhinini as currently understood. Most recently, KOŠŤÁL (2021) realized that the genus *Ophryodotus* PASCOE, 1887 was a complex of several genera, summarized the historical and current taxonomy of the Hipporhinini, and described the closely related genus *Boroveciella* KOŠŤÁL, 2021 (including three new species from South Africa).

Based on the very rich material of cyclomines sifted in dry South African habitats by R. Borovec, another new genus, related to *Ophryodotus*, is described below.

Material and methods

Processing of specimens (treatment, mounting of terminalia, and photography) follows KOŠŤÁL (2018). Distances between coxae are interpreted as the shortest distance between the median margins of the coxae. Rostrum length is interpreted as the distance from the line connecting the anterior margin of supraocular protuberances to the apex, excluding mandibles. The terminology follows KOŠŤÁL (2021).

Abbreviations:

El, Ew	maximum elytral length, maximum elytral width
Pl, Pw	pronotal length, pronotal width
Rl, Rw	rostrum length (from the rostrum base to the apex of the rostrum, mandibles excluded), rostrum width (at widest point)
BO	Collection Roman Borovec, Sloupno, Czechia
KO	Collection Michael Košťál, Šoporňa, Slovakia
NHML	Natural History Museum, London, UK
NMP	National Museum, Museum of Natural History, Prague, Czechia
NMW	Naturhistorisches Museum Wien, Vienna, Austria

***Nanophryodotus* gen.n.**

TYPE SPECIES: *Nanophryodotus cerula* sp.n.

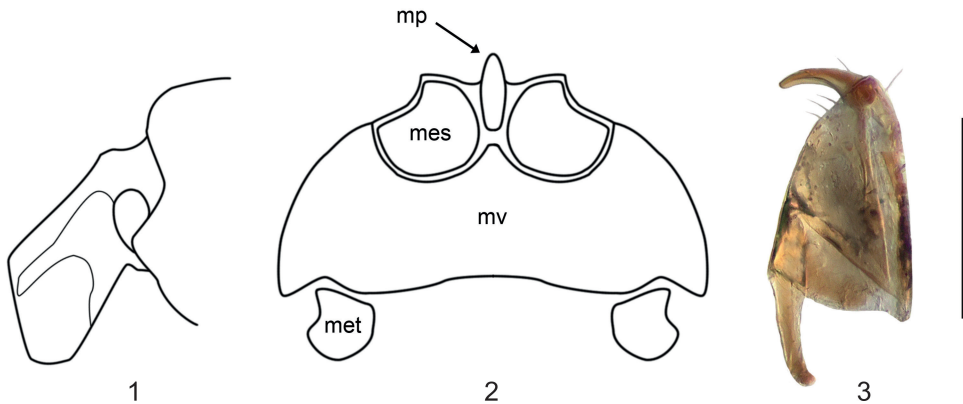
DIAGNOSTIC DESCRIPTION: 2.67–3.53 mm long, rostrum in dorsal view moderately longer than wide (Rl/Rw 1.38–1.53), epifrons slightly, somewhat irregularly convergent from base to apex, at base with apparent protuberance above eye, from base to antennal insertion with shallow ill-defined longitudinal sulcus being somewhat deeper in basal part, flat at apex, moderately densely covered with adpressed, elongate to feather-like pale scales; in lateral view (Fig. 1) rectilinearly, moderately to markedly widened from base to apex, antennal groove deep, broad, with sharp upper margin passing above eye; antennal funicle 6-segmented, as long as or somewhat shorter than scape, segment 1 0.8–1.0 × as long as segments 2–6 combined, scape markedly enlarged apicad, at apex as wide or slightly wider than club; pronotum and elytra completely covered with irregularly angular, adpressed whitish to dark brown scales being never shiny; pronotum with irregularly subparallel sides and impressions on disc; elytral interstriae with tubercles and ridges of various size and height; prosternum with strikingly broad, deep canal widely open posteriad, procoxae at anterior side flat, contiguous, mesocoxae almost contiguous, anteriorly slightly separated by very thin mesoventral process, much thinner than mesocoxa diameter, often elevated in anterior part, distance of metacoxae at last 6.7 × as long as distance of mesocoxae (Fig. 2); ventrites (Figs. 7–9) completely covered with adpressed, polygonal to subtriangular, light brownish scales, suture between ventrite 1 and 2 in median 1/5–1/2 connate, moderately arched anteriorly, suture between ventrites 2 and 3 almost straight; tarsi short, plump, onychium shorter than or almost as long as tarsomeres 1–3 combined, of same width or slightly narrower than tarsomere 3, slightly longer than wide.

Penis (Figs. 4c–d, 5c–d, 6c–d) 2.1–2.5 × as long as wide, rounded to sharply tipped at apex, in basal half with pair of small sclerites, always clearly shorter than temones, manubrium simple, slightly longer than diameter of tegmen, parameroid lobes absent; spiculum gastrale long, thin, its basal plates moderately well developed, irregularly shaped; 8th hemisternite developed; spiculum ventrale (Figs. 4e, 5e, 6e) cup-shaped, with well developed, often apically enlarged manubrium; spermatheca (Figs. 4f, 5f, 6f) with well developed cornu, always with more or less prominent ramus; ovipositor (Figs. 3, 10–12) with connate gonocoxites, proximal ones with very long process (“wing”) slightly bent mediad; distal gonocoxites apically with several long setae, styli moderately long, strongly sclerotized, claw-like, without setae.

COMPARATIVE NOTES: *Nanophryodotus* is undoubtedly most closely related to the genera *Ophryodotus* and *Boroveciella*. It differs from the former in the 6-segmented funicle (7-segmented in *Ophryodotus*), thinner, often at anterior margin elevated mesoventral process, much smaller body size, ovipositor with inwardly bent process of proximal gonocoxite, and shorter styli. From *Boroveciella* it differs in lateral view in rectilinearly widened rostrum without transverse carina in the apical part of the rostrum, thinner and much smaller mesoventral process, almost contiguous mesocoxae, lack of shiny scales on pronotum and elytra. All above mentioned characters, especially those on the ventral side and rostrum, are obviously conservative, and delimitate all three genera.

DISTRIBUTION: The three species are restricted to the northern Western Cape and the southwestern Northern Cape provinces (South Africa).

ETYMOLOGY: The Greek prefix “nano” (dwarf) refers to the small body size of this genus, unusual in the Hipporhinini. The root word refers to *Ophryodotus*, a closely related genus. The gender is masculine.



Figs. 1–3: *Nanophryodotus cerula* (paratype), 1) head, lateral view; 2) metaventrite (mv), mesoventral process (mp), meso- (mes) and metacoxae (met); 3) ovipositor. Scale bar: 0.25 mm. Figs. 1–2 not to scale.

Nanophryodotus cerula sp.n.

Holotype ♂ (NMP): “RSA Northern Cape 582 m Richtersveld 7 km N Helskloof 28°17.213' S, 16°59.381' E 2.xi.2011 R. Borovec leg. \ Sifting of detritus and dead leaves below Chenopodiaceae shrubs”. **Paratypes**: same data: 4 ♂♂, 9 ♀♀ (BO), 2 ♂♂, 1 ♀ (KO), 1 ♂ (NMW); 3 ♂♂, 5 ♀♀ (BO): “RSA Northern Cape 463 m Richtersveld NP 18.xi.2016 Pass 2 km S X RT 14 28°17.309' S, 17°02.657' E R. Borovec leg.”; 1 ♂ (KO): same data; 2 ♀♀ (BO): “RSA Northern Cape 622 m Richtersveld N Helskloof 28°17.484' S, 16°59.263' E 3.xi.2011 R. Borovec leg. \ Sifting of detritus and dead leaves below Chenopodiaceae shrubs”; 2 ♂♂ (BO): “RSA Northern Cape Richtersveld 465 m Koeroegab 19.ix.2013 28°17.298' S, 17°02.606' E \ Sifting of detritus, dead leaves and branches below shrubby *Euphorbia* R. Borovec, M. Meregalli leg.”; 1 ♂ (KO): same data; 1 ♂, 1 ♀ (NHML): “RSA Northern Cape 585 m Richtersveld, W Akkedis Pass 28°11.024' S, 17°02.059' E 18.xi.2016 R. Borovec leg. \ Sifting of detritus, dead leaves and branches below shrubby *Euphorbia*”; 1 ♂ (BO): same data; 1 ♂, 1 ♀ (KO): same data; 5 ♂♂, 1 ♀ (BO): “RSA Northern Cape Richtersveld area 580 m Ploeberg 18.ix.2013 28°37.818' S, 17°00.462' E \ Sifting of detritus, dead leaves and branches below shrubby *Euphorbia* R. Borovec, M. Meregalli leg.”; 1 ♂ (KO): same data; 1 ♀ (BO): “RSA Western Cape 602 m Vanrhynsdorp Matsikamma Mts 31°46.161' S, 18°45.523' E 10.ix.2013 R. Borovec leg.”.

DIAGNOSIS: This species is recognizable by the pronotum being moderately longer than wide (Pl/Pw ~ 1.1), by the protruding supraocular protuberances, less steep gradual elytral declivity, interstria 9 in posthumeral area with sharp but not large tubercles, the presence of whitish V-shaped to tricuspid scales (on tips of tubercles on the pronotum and elytra, in pronotal periscutellar area, at base of humeri), and by the moderately sharp apex of the penis.

DESCRIPTION: Holotype: Completely preserved, 3.08 mm long male. Integument blackish, antennae reddish-brown, completely covered with very dense adpressed light brown to piceous subtriangular scales and additional, more sparse whitish V-shaped to tricuspid scales concentrated on tips of tubercles on pronotum and elytra, in pronotal periscutellar area, and at base of humeri. Piceous scales prevalent in basal part of pronotum and on ridges of elytra (Figs. 4a–b).

Head: Rostrum stout, short (Rl/Rw 1.53 Rl/Pl 0.56); in dorsal view (Fig. 4a) widest at 2/3, narrowed from base to about midlength, then widened apicad; epifrons conically narrowed anteriorly, with shallow longitudinal sulcus ending before apex, completely covered with adpressed light brownish scales and additional tricuspid sparse whitish scales, in anterior part

flat, at anterior margin beveled anteriorly, epistome scale-free, relatively roughly shagreened, with forwardly oriented setae; in lateral view (Fig. 1, 4b) rectilinearly markedly widened to apex; at apex with relatively long erect setae oriented anteriorly; antennal scrobes deep, its upper margin straight, directed above eye, in basal half broadly open downwards. Head capsule in dorsal view with deep longitudinal incision, above eyes with relatively sharp, laterally prominent protuberances, in lateral view protuberances forming elevation of upper head outline, behind elevation with moderately deep declivity. Eyes small, subelliptical, flat, positioned laterally, in dorsal view not visible. Antennae except club with sparse suberect light brown setae, inserted at 0.7 of rostrum length, insertions in dorsal view hardly visible, scape $1.2 \times$ as long as funicle, very strongly widened apically, segment 1 approximately as long as segments 2–6 combined, segment 2 about twice as long as wide, segments 3–6 transverse, club shortly cone-shaped, less than twice as long as wide.

Pronotum (Figs. 4a–b): Longer than wide (Pl/Pw 1.10), widest at 0.6 of its length, sides in dorsal view irregular, at $2/3$ of its length with marked incision, shortly behind midlength with laterally protruding tubercles, anterior and posterior margin evenly rounded, in median part with large deep impression delimited by two lateral unevenly high ridges converging anteriorly, in anterolateral area with shallow impressions; upper outline in lateral view in basal $1/3$ with marked elevation, anterior margin rounded ventrad; broad mediobasal area very densely covered with adpressed piceous scales, remaining areas covered with very dense adpressed light brown scales completely concealing integument, on lateral tubercles, ridges and in prescutellar area additional V-shaped and tricuspid whitish scales.

Scutellum (Fig. 4a): Very small, fully covered with pale scales.

Elytra (Figs. 4a–b): Longer than wide (El/Ew 1.41), from humeral apex to $2/3$ of length subparallel, with irregular outline and moderate enlargement shortly behind humeri, in distal part irregularly subconically narrowed with small incision at apex, base as wide as half of maximum elytral width, deeply, evenly arcuately emarginate, humeri large, slightly prominent; widest at enlargement behind humeri; interstriae broad, of uneven width, with numerous irregular ridges and large, relatively high tubercles; completely covered with adpressed light and dark brown scales, and whitish scales on tops of ridges and tubercles, all scale types of same shape as on pronotum; interstria 1 with alternating small tubercles, especially in posterior part, interstria 3 at base slightly, at midlength strikingly elevated, forming anteriorly short, posteriorly long high ridge, at $5/6$ of length at beginning of declivity with two conspicuous tubercles, interstria 5 shortly before midlength and at $2/3$ with apparent tubercles, interstria 7 from posthumeral to preapical area strongly elevated, forming irregular sharp ridge posteriorly even more elevated, interstria 9 in posthumeral area with tubercles resulting in outline enlargement; in lateral view almost flat on disc, with irregular outline; at $5/6$ of length gradually sloping to moderately steep declivity.

Venter: Densely covered with subcircular adpressed whitish and light brown scales, rostral canal very broad, almost of pronotum half width, deep, densely covered with large whitish scales, delimited by two high, large lobes elevated posteriorly; metaventrite very slightly concave, ventrite 1 and anterior part of ventrite 2 with broad, relatively deep median impression, distance of metacoxae $8.7 \times$ as long as the distance of mesocoxae; ventrite 1 $1.4 \times$ as long as ventrite 2, the latter $1.9 \times$ as long as ventrites 3–4 combined, ventrite 5 $1.3 \times$ as long as ventrites 3–4 combined, ventrite 1 moderately irregularly punctate, punctures deep, subcircular (Fig. 7).

Legs (Fig. 4a): Femora short, very robust, flattened, with broad, relatively deep preapical emargination; tibiae short, plump, with four black spines on apical edge, very feebly mucronate to amucronate, inner margin of protibiae sinuate; onychium $0.6 \times$ as long as tarsomeres 1–3 combined, tarsomere 1 triangular, tarsomeres 2 and 3 transverse, onychium $1.2 \times$ as long as

wide, claws simple, thin, free, markedly divergent; femora and tibiae covered with very dense, adpressed brown scales, moderately dense thin whitish scales and very sparse suberect brownish scales, additional adpressed dark brown scales forming transverse bands, on metafemora dark patches, tarsi covered with very dense, light brown scales and moderately erect setae.

Penis (Fig. 4c–d, 13): Penis short, $2.3 \times$ as long as wide, with rounded sides, bluntly tapered at apex; in lateral view (Fig. 4d) evenly bent, almost straight at apex; in dorsal view (Fig. 13) broad, somewhat sharply ended at apex.

Female: As in male, except metaventrite, ventrites 1 and 2 flat. Spiculum ventrale (Fig. 4e) at distal margin with several moderately long setae, at proximal end enlarged. Spermatheca (Fig. 4f) with well developed ramus and collum, corpus moderately large, cornu relatively long. Ovipositor (Fig. 10) with distal gonocoxite bearing few moderately long setae, styli sharp, relatively small.

COMPARATIVE NOTES: *Nanophryodotus cerula* is most closely related to *N. romani* from which it differs in sharp protruding supraocular protuberances, in the presence of thin whitish scales on tips of pronotal and elytral tubercles, and especially in the sharply ended but not tipped apex of the penis (Fig. 13). From *N. angusticollis* it differs in the absence of sharply protruding tubercles in the posthumeral area on the interstria 9, in the shorter pronotum (PI/Pw 1.1 vs. 1.3), and in the elytral base not narrower than half of the maximum elytral width.

VARIABILITY: Body length: $\sigma\sigma$ 2.69–3.14 mm, $\varphi\varphi$ 3.02–3.53 mm. The type series shows some variability in coloration, especially in the size of dark areas on the pronotum and elytra, which may be large and striking to almost unnoticeable. The sculpture varies in a remarkable extent due to the soil filling around tubercles and ridges caused by the terricolous way of life. Some specimens have almost no dark areas on the pronotum and elytra. Styli of ovipositor may vary in length.

DISTRIBUTION: South Africa (Northern Cape, Western Cape).

BIONOMICS: Unknown. The type specimens were collected in dry habitats by sifting under shrubby Euphorbiaceae (*Euphorbia* sp.), and under Chenopodiaceae shrubs.

ETYMOLOGY: The epithet (*cerula* = wax) is a Latin noun in apposition. The name refers to the general appearance of the beetle's body, which looks kind of waxy.

Nanophryodotus angusticollis sp.n.

Holotype σ (NMP): “RSA Northern Cape 370 m Messelpad Pass 14.xi.2016 29°54.597' S, 17°44.282' E R. Borovec leg. \ Sifting of detritus, dead leaves and branches below shrubby *Euphorbia*”. **Paratypes**: same data: 3 $\varphi\varphi$ (BO), 1 σ , 1 φ (KO); 1 σ , 3 $\varphi\varphi$ (BO): “RSA Northern Cape 622 m Richtersveld N Helskloof 28°17.484' S, 16°59.263' E 3.xi.2011 R. Borovec leg. \ Sifting of detritus and dead leaves below Chenopodiaceae shrubs”; 1 σ (NMW): same data; 1 φ (BO): “RSA Western Cape 607 m Ca 20km N Garies, sifting 30°25.505' S, 17°56.161' E 13.xi.2016 R. Borovec leg. \ Sifting of detritus, died leaves and branches below shrubby *Euphorbia*”; 1 σ (KO): same data; 2 $\sigma\sigma$, 1 φ (BO): “RSA Northern Cape 757 m Ca 2km NE Nigramoep 29°27.147' S, 17°37.968' E R. Borovec leg. 15.xi.2016 Sifting below *Euphorbia*”; 1 σ (NHML): same data; 2 $\sigma\sigma$, 1 φ (BO): “RSA Northern Cape 541 m 40 km S Springbok, Die Drif near Koringhuis, sifting 29°59.139' S, 17°51.875' E 31.x.2011 R. Borovec leg. \ Sifting of detritus and died leaves below different shrubs with dominant *Euphorbia*”; 1 σ , 1 φ (KO): same data; 2 $\sigma\sigma$ (BO): “RSA Northern Cape 55 m Camping Sendelingsdrift 28°07.381' S, 16°53.519' E 2.xi.2011 R. Borovec leg. \ Individually collected under stones”.

DIAGNOSIS: This species is recognizable by the pronotum considerably longer than wide (PI/Pw \sim 1.3), blunt supraocular protuberances especially in females, very steep abrupt elytral declivity, tubercles on interstria 9 in posthumeral area large, sharp, strikingly protruding from the outline of elytra, the absence of thin whitish scales on pronotum and elytra, and by rounded apex of the penis.

DESCRIPTION: Holotype: Completely preserved, 3.17 mm long male. Integument blackish, antennae reddish-brown except dark brown clubs, completely covered with very dense adpressed, irregularly angular light brown and dark brown scales. Dark scales prevalent in basal part of pronotum and in medial part of elytral interstices 4–7 forming dark irregular maculae (Fig. 5a–b).

Head: Rostrum stout, short (RI/Rw 1.38 RI/PI 0.52); in dorsal view (Fig. 5a) widest at 2/3, outline as in *N. cerula*; epifrons conically narrowed anteriorly, with very slightly apparent longitudinal sulcus in basal part, vestiture as in *N. cerula*, at anterior margin moderately beveled anteriorly, epistome as in *N. cerula*; in lateral view (Fig. 5b) slightly widened to apex; setae at apex and antennal scrobes as in *N. cerula*. Head capsule in dorsal view with medial incision, above eyes with flat, laterally weakly prominent protuberances, in lateral view with declivity behind protuberances. Eyes as in *N. cerula*. Antennae approximately as in *N. cerula*.

Pronotum (Figs. 5a–b): Conspicuously longer than wide (PI/Pw 1.36), widest at midlength, sides in dorsal view slightly divergent from base to apex, at midlength with laterally protruding tubercles, anterior and posterior margin evenly rounded, in median part with flat impression delimited by two pairs of tubercles, posterior tubercles large, relatively high, their distance larger than that of anterior ones, in anterolateral area with shallow impressions; upper outline in lateral view in basal half elevated from base to midlength, then abruptly slanting anteriorly, anterior margin rounded; basal area very densely covered with adpressed dark brown scales, remaining areas covered with adpressed light brown scales completely concealing integument.

Scutellum (Fig. 5a): As in *N. cerula*.

Elytra (Figs. 5a–b): Longer than wide (EI/Ew 1.30), from 1/4 to 2/3 of length parallel, with almost rectilinear outline, at 1/6 of length with strikingly sharp enlargement, in posterior part broadly, strongly irregularly rounded with two large posterolateral tubercles, apex with very small incision, base as wide as 0.45 of maximum elytral width, deeply, evenly arcuately emarginated, humeri large, clearly prominent; widest at sharp enlargement behind humeri; interstriae as in *N. cerula*, but without thin white scales; interstria 1 in anterior 2/3 almost flat, interstria 3 at base and at 0.6 of length with small, at 0.8 of length at beginning of declivity with large strongly prominent tubercles, interstria 5 in anterior part with small, at 2/3 of length with larger tubercles, interstria 7 from posthumeral to preapical area somewhat edge-like elevated, ending in two large posterolateral tubercles, interstria 9 in posthumeral area with strikingly sharp tubercles resulting in outline enlargement; in lateral view flat on disc, with strongly irregular outline; at 0.8 of length abruptly sloping to very steep declivity.

Venter: Densely covered with subtriangular and subcircular adpressed light brown scales, and additional sparse elongate subrecumbent scales of same colour, rostral canal as in *N. cerula*; metaventrite slightly concave, ventrites 1 and 2 with very broad impression, similar to that in *N. cerula*, distance of metacoxae $6.7 \times$ as long as the distance of mesocoxae; ventrite 1 $1.4 \times$ as long as ventrite 2, the latter $1.6 \times$ as long as ventrites 3–4 combined, ventrite 5 $1.5 \times$ as long as ventrites 3–4 combined, ventrite 1 sparsely irregularly punctate, punctures deep, almost circular (Fig. 8).

Legs (Fig. 5a): Femora moderately long, moderately robust, otherwise as in *N. cerula*; tibiae as in *N. cerula* except inner margin moderately sinuate; onychium almost as long as tarsomeres 1–3 combined, tarsomere 1 irregularly triangular, tarsomeres 2 and 3 transverse, onychium $1.5 \times$ as long as wide, claws as in *N. cerula*; femora and tibiae covered with very dense, adpressed, light brown scales, and sparse suberect light and brown scales, tibiae with moderately dense thin whitish scales, metafemora and metatibiae with transverse bands and patches formed by adpressed dark brown scales, vestiture of tarsi as in *N. cerula*.

Penis (Figs. 5c–d, 14): Penis short, $2.4 \times$ as long as wide, with subparallel sides, rounded at apex; in lateral view (Fig. 5d) almost evenly bent, straight at apex; in dorsal view (Fig. 14) rounded at apex.

Female: As in male, except metaventrite, ventrites 1 and 2 flat, and more blunt supraocular protuberances. Spiculum ventrale (Fig. 5e) at distal margin as in *N. cerula*, at proximal end feebly enlarged. Spermatheca (Fig. 5f) similar to that in *N. cerula* but cornu longer and thinner. Ovipositor (Fig. 11) with distal gonocoxite bearing relatively long setae, styli long, thin, irregularly curved.

COMPARATIVE NOTES: *Nanophryodotus angusticollis* differs from *N. cerula* and *N. romani* in the presence of a large acute tubercle in posthumeral area of the interstria 9 strikingly protruding from the elytral outline, in the long and narrow pronotum (PI/Pw 1.3 vs. 1.1), in the base of elytra narrower than half of the maximum elytral width (Figs. 5a–b), and in the rounded apex of the penis (Fig. 14).

VARIABILITY: Body length: $\sigma \sigma$ 2.67–3.28 mm, $\varphi \varphi$ 2.89–3.38 mm. The type series shows a certain variability in coloration and sculpture similar to that in *N. cerula*. Supraocular protuberances can be observed in most specimens, although they are reduced in the size, especially in females.

DISTRIBUTION: South Africa (Northern Cape, Western Cape).

BIONOMICS: Unknown. The type series was collected in the same way as *N. cerula*.

ETYMOLOGY: The epithet is a Latin adjective meaning “narrow neck”. It refers to the narrow pronotum typical for this species.

Nanophryodotus romani sp.n.

Holotype σ (NMP): “RSA Northern Cape 910 m Richtersveld area sifting Ploeborg Mts. 17.xi.2016 28°35.627' S, 17°01.671' E R.Borovec leg.”. **Paratypes**: same data: 1 σ , 1 φ (BO), 1 σ (KO).

DIAGNOSIS: *Nanophryodotus romani* is recognizable by the pronotum moderately longer than wide (PI/Pw about 1.1), blunt supraocular protuberances, steep abrupt elytral declivity, tubercles on interstria 9 in posthumeral area large, resulting in the enlargement of elytral outline but not sharply protruding from it, the absence of thin whitish scales on the pronotum and elytra, and most importantly by clearly tipped apex of the penis.

DESCRIPTION: Holotype: Completely preserved, 3.30 mm long male. Integument blackish-brown, antennae brown, completely covered with very dense adpressed irregularly angular dark and light brown scales. Dark brown scales prevalent in mediobasal part of pronotum and in median part of elytra (Figs. 6a–b).

Head: Rostrum stout, short (RI/Rw 1.44 RI/PI 0.56); in dorsal view (Fig. 6a) widest at $2/3$ of its length, narrowed from base to 0.3 of its length, then considerably widened apicad to antennal insertion; epifrons as in *N. cerula*, longitudinal sulcus in anterior part almost inapparent, epistome scale-free, sparsely punctate, shiny, with sparse, forwardly oriented setae; in lateral view (Fig. 6b) rectilinearly widened to apex; at apex with long erect setae oriented anteriorly; antennal scrobes broad, deep, their margins as in *N. cerula*. Head capsule in dorsal view as in *N. cerula*, supraocular protuberances blunt, in lateral view behind protuberances with deep declivity. Eyes as in *N. cerula*. Antennae with vestiture as in *N. cerula*, inserted at $3/4$ of rostrum length, insertions in dorsal view slightly visible, scape $1.3 \times$ as long as funicle, strongly widened apicad, segment 1 $0.8 \times$ as long as segments 2–6 combined, segment 2 slightly more than twice as long as wide, segment 3 isodiametric, segments 4–6 transverse, club cone-shaped, $2.3 \times$ as long as wide.

Pronotum (Figs. 6a–b): Longer than wide (Pl/Pw 1.1), widest at midlength, sides in dorsal view irregular, with moderately deep incision behind midlength, at midlength with blunt, laterally protruding tubercles, margins, impressions and ridges as in *N. cerula*; upper outline in lateral view in basal 1/3 with marked elevation, behind midlength with depression, anterior margin rounded; vestiture except missing whitish scales as in *N. cerula*.

Scutellum (Fig. 6a): Hardly discernable.

Elytra (Figs. 6a–b): Longer than wide (Pl/Pw 1.29), from 1/4 to 2/3 of length subparallel, with irregular outline and enlargement at and behind humeri, in posterior part very irregularly subconically narrowed, at 0.8 of length with marked emargination, base as in *N. cerula*, humeri large, moderately prominent; widest at enlargement behind humeri; interstriae similar to those in *N. cerula*; interstria 1 relatively flat, interstria 3 at base and midlength with low ridges, at 0.8 of length at beginning of declivity with very striking high tubercles, interstria 5 before midlength and especially at 2/3 of length with conspicuous tubercles, interstria 7 as in *N. cerula*, interstria 9 in posthumeral area with large tubercles resulting in outline enlargement; in lateral view almost flat on disc, with irregular outline; at 0.8 of length abruptly sloping to steep declivity.

Venter: Vestiture and rostral canal as in *N. cerula*; metaventricle concave, ventrite 1 and 2 as in *N. cerula*, distance of metacoxae much bigger than distance of mesocoxae, the latter ones almost adjoining; ventrite 1 $1.6 \times$ as long as ventrite 2, the latter as long as ventrites 3–4 combined, ventrite 5 $1.1 \times$ as long as ventrites 3–4 combined, ventrite 1 densely irregularly punctate, punctures deep, subcircular (Fig. 9).

Legs (Fig. 6a): Femora and tibiae moderately long, otherwise as in *N. cerula*; onychium somewhat shorter than tarsomeres 1–3 combined, tarsomere 1 small and short, tarsomeres 2 and 3 transverse, onychium $1.2 \times$ as long as wide; vestiture and claws as in *N. cerula*.

Penis (Figs. 6c–d, 15): Penis short, $2.1 \times$ as long as wide, with slightly rounded sides and clearly prominent tip at apex; in lateral view (Fig. 6d) evenly bent, straight at apex; in dorsal view (Fig. 15) clearly tipped at apex.

Female: As in *N. cerula*. Spiculum ventrale (Fig. 6e) at distal margin with several short setae, at proximal end enlarged. Spermatheca (Fig. 6f) with weakly developed ramus, collum ill-defined, corpus large, cornu short, blunt. Ovipositor (Fig. 12) with distal gonocoxite bearing long setae, styli large, not conspicuously sharp.

COMPARATIVE NOTES: *Nanophryodotus romani* is most closely related to *N. cerula* from which it differs in the blunt protruding supraocular protuberances, in the absence of thin whitish scales on tips of tubercles on pronotum and elytra, and especially in the clearly tipped apex of the penis (Fig. 15). From *N. angusticollis* it differs in the absence of sharply protruding tubercles in the posthumeral area on the interstria 9, in the pronotum less long (Pl/Pw 1.1 vs. 1.3), and in the elytral base not narrower than half of the maximum elytral width.

VARIABILITY: Body length: ♂♂ 3.30–3.43 mm, ♀ 3.33 mm. The four type specimens show no noteworthy variability except that caused by abrasion and soil filling.

DISTRIBUTION: South Africa (Northern Cape).

BIONOMICS: Unknown. The type series was sifted from litter in a dry habitat.

ETYMOLOGY: I devote this species to my friend and colleague Roman Borovec, an outstanding specialist in weevils, who collected a very rich material of Cyclominae, which forms part of this study.

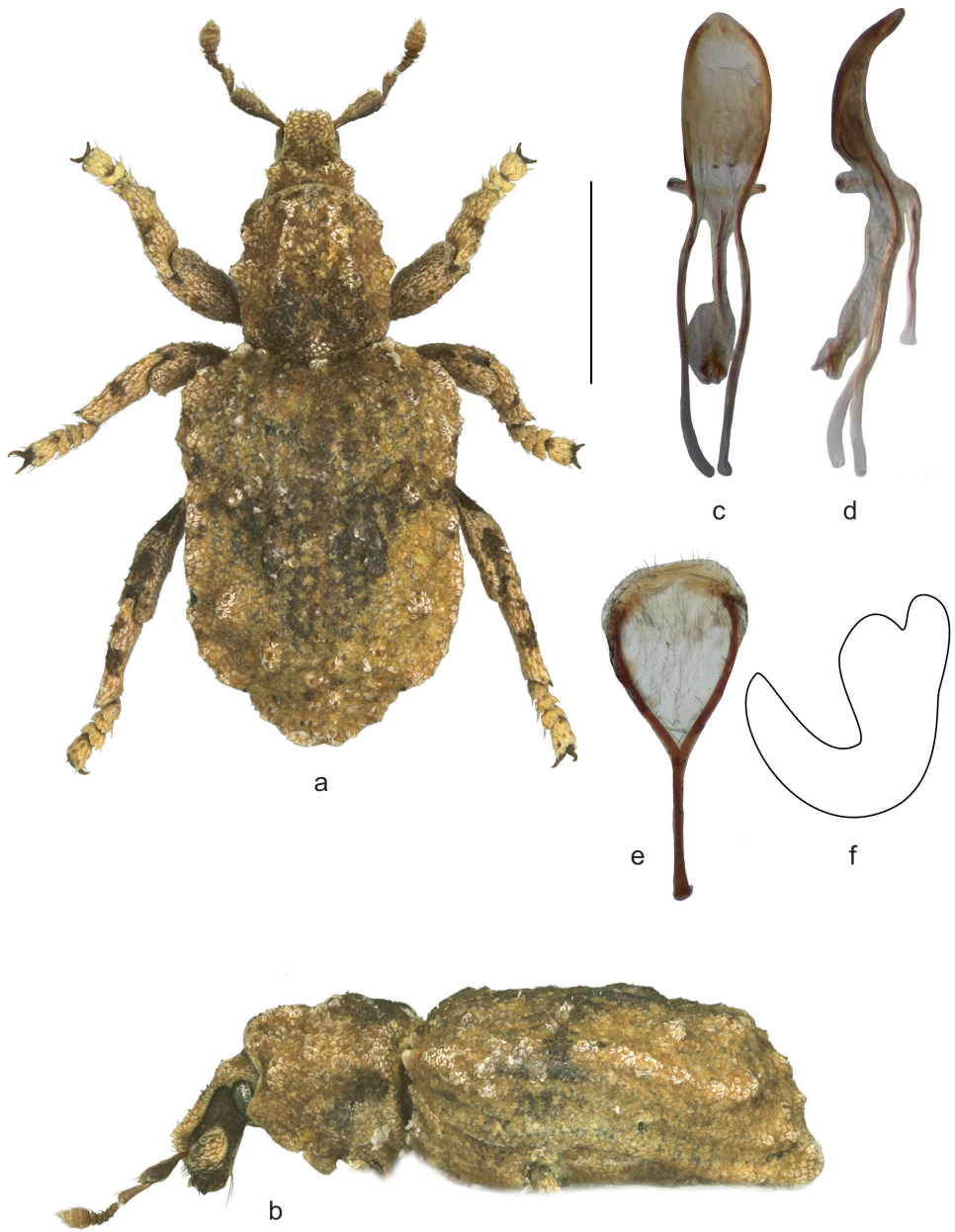


Fig. 4: *Nanophryodotus cerula*, a) habitus (holotype), dorsal view, b) same, lateral view, c) penis, ventral view, d) penis, lateral view, e) spiculum ventrale (8th sternite), f) spermatheca. Scale bar: 0.5 mm. Figs. 4a–b, f not to scale.

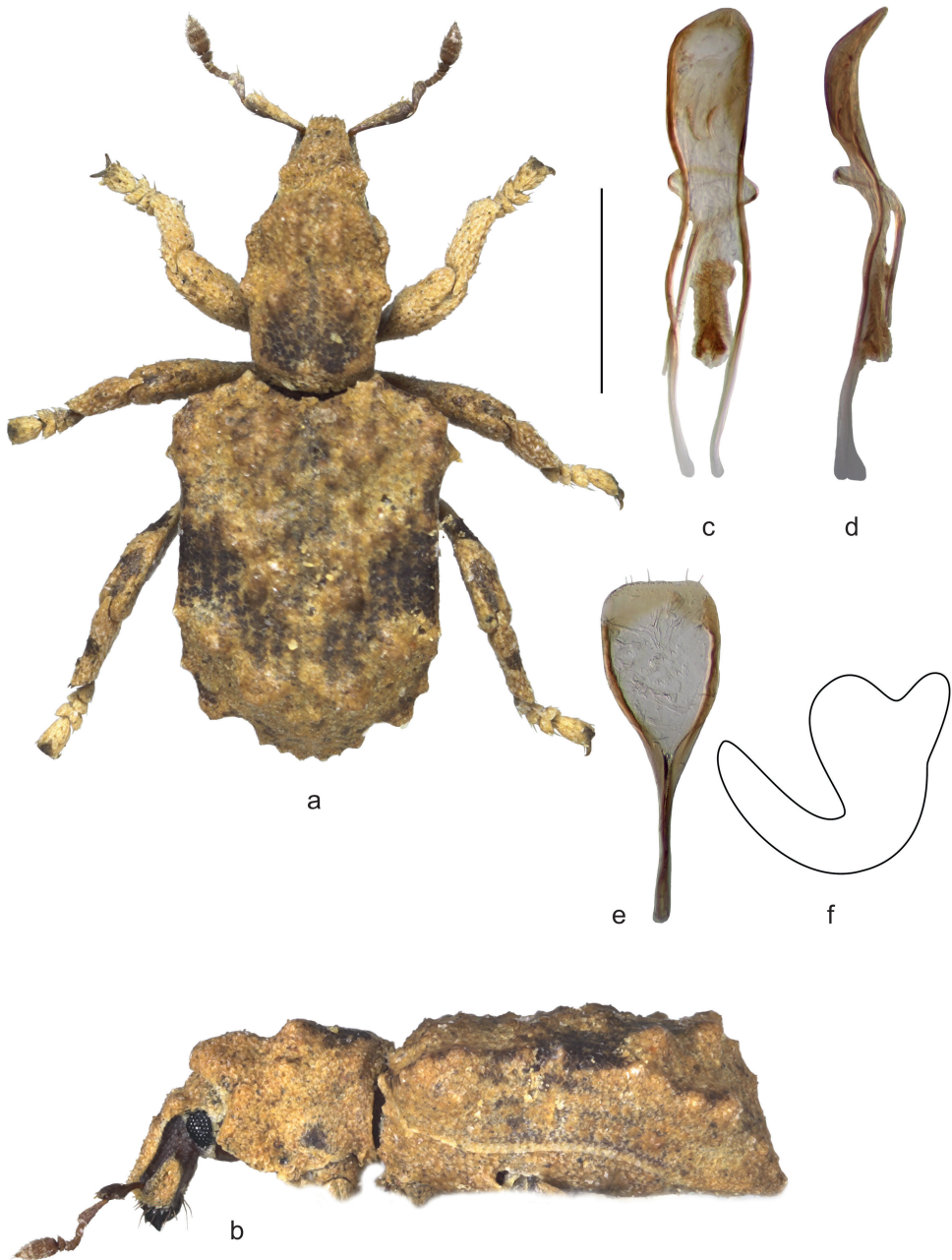


Fig. 5: *Nanophryodotus angusticollis*, a) habitus (holotype), dorsal view, b) same, lateral view, c) penis, ventral view, d) same, lateral view, e) spiculum ventrale (8th sternite), f) spermatheca. Scale bar: 0.5 mm. Figs. 5a–b, f not to scale.

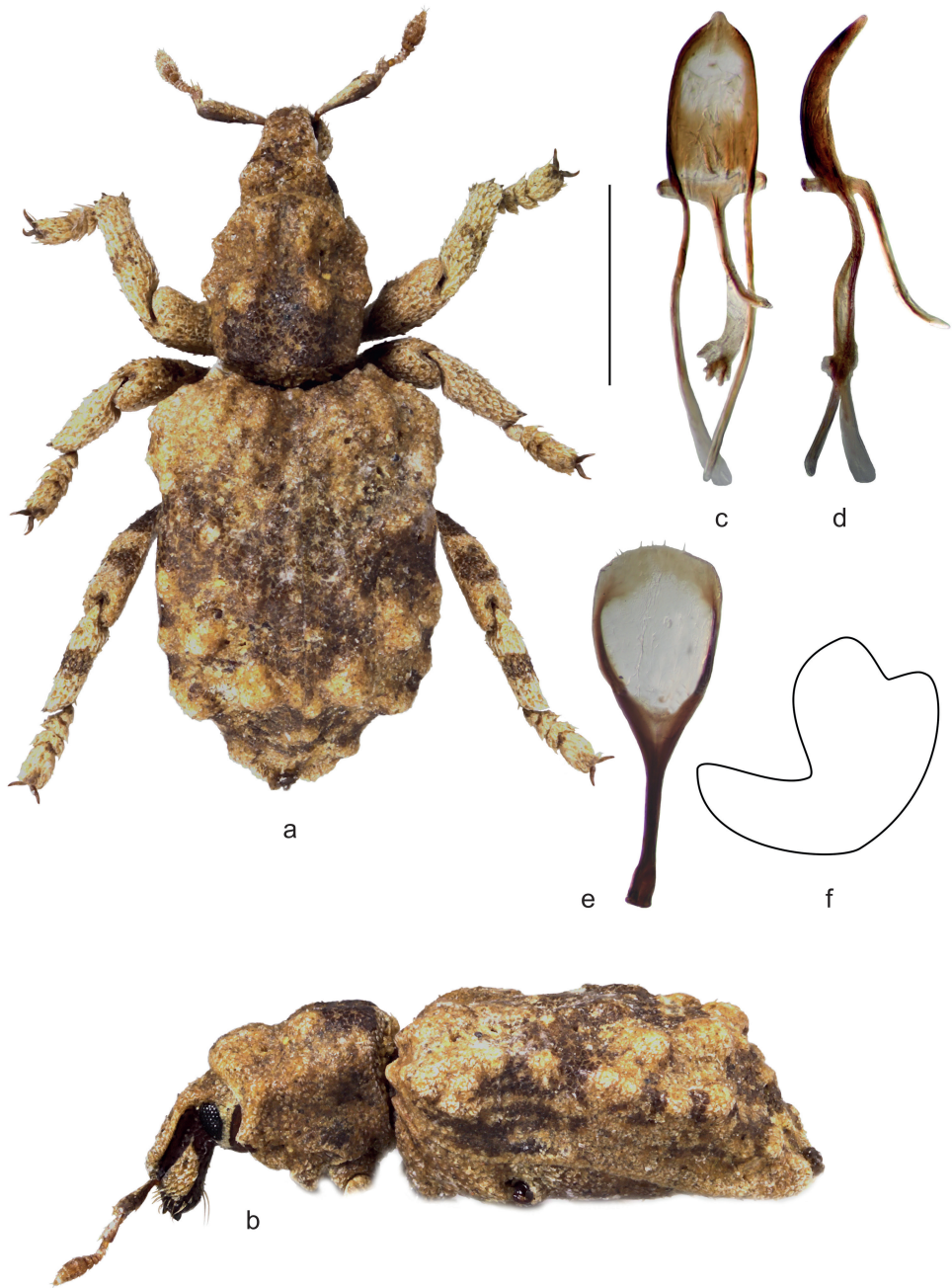
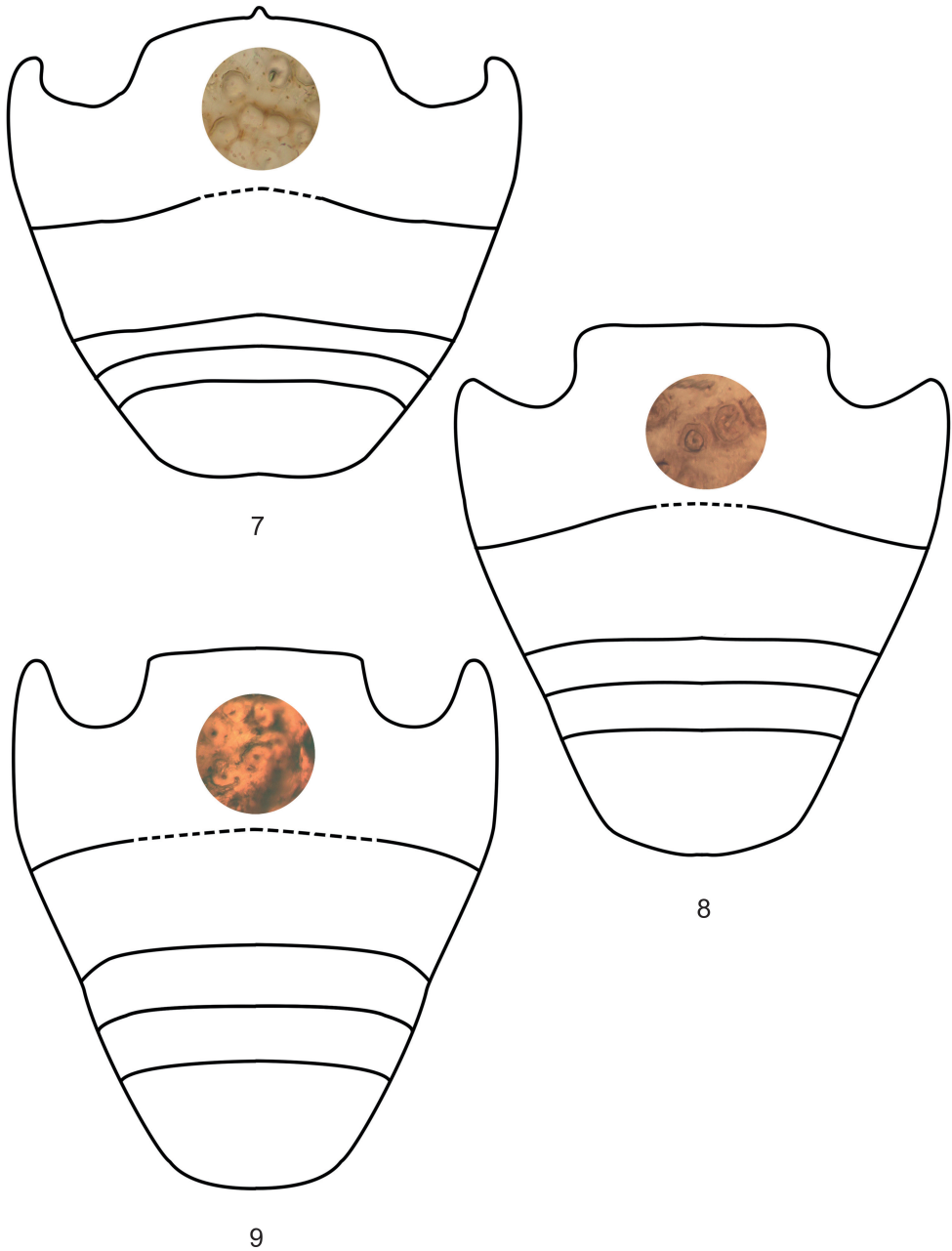
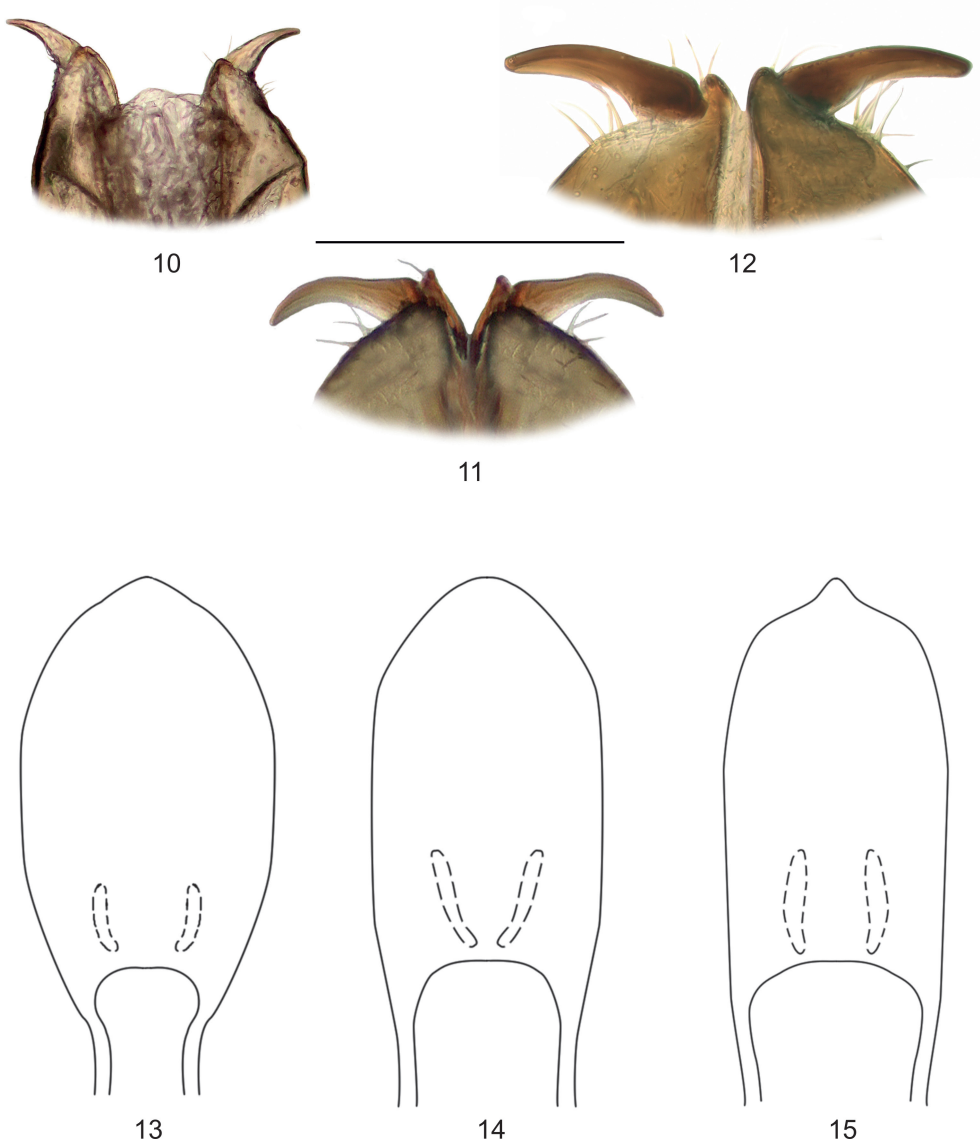


Fig. 6: *Nanophryodotus romani*, a) habitus (holotype), dorsal view, b) same, lateral view, c) penis, ventral view, d) same, lateral view, e) spiculum ventrale (8th sternite), f) spermatheca. Scale bar: 0.5 mm. Figs. 6a–b, f not to scale.



Figs. 7–9: Sutures and outlines of ventrites 1–5, texture of ventrite 1: 7) *Nanophryodotus cerula*, 8) *N. angusticollis*, 9) *N. romani*. Not to scale.



Figs. 10–12: Distal gonocoxite with styli: 10) *Nanophryodotus cerula*, 11) *N. angusticollis*, 12) *N. romani*. Scale bar: 0.25 mm.

Figs. 13–15: Penis in dorsal view: 13) *Nanophryodotus cerula*, 14) *N. angusticollis*, 15) *N. romani*. Not to scale.

Key to the species of *Nanophryodotus*

- 1 Pronotum moderately longer than wide (Pl/Pw ~ 1.1), base of elytra at least as wide as half of their maximum width. Elytral interstice 9 in posthumeral area with more or less large tubercle not strikingly protruding from elytral outline (Figs. 4a, 6a). Apex of penis in dorsal view not widely rounded (Figs. 13, 15)..... 2
- Pronotum conspicuously longer than wide (Pl/Pw ~ 1.3), base of elytra always narrower than half of their maximum width. Elytral interstice 9 in posthumeral area with large sharp tubercle strikingly protruding from elytral outline (Figs. 5a). Apex of penis in dorsal view widely rounded (Figs. 14)..... *angusticollis* sp.n.
- 2 Supraocular protuberances sharp, protruding laterally (Fig. 4a). Elytral declivity in lateral view less steep, gradual (Fig. 4b), elytra and pronotum of fresh specimens with thin whitish V-shaped or tricuspid scales on tips of tubercles, in pronotal periscutellar area and at humeri (Fig. 4a). Apex of penis in dorsal view with evenly rounded to weakly pointed tip (Fig. 13)..... *cerula* sp.n.
- Supraocular protuberances blunt, hardly protruding laterally (Fig. 6a). Elytral declivity in lateral view steep, abrupt (Fig. 6b), elytra and pronotum of fresh specimens without whitish V-shaped or tricuspid scales (Fig. 6a). Apex of penis in dorsal view emarginate before strongly pointed tip (Fig. 15)..... *romani* sp.n.

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