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Description of *Hydrosmeptomorpha* Klimaszewski and Webster,
a new subgenus of *Atheta* C. G. Thomson,
with three new Canadian species
(Coleoptera: Staphylinidae: Aleocharinae)

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Description of *Hydrosmectomorpha* Klimaszewski and Webster, a new subgenus of *Atheta* C. G. Thomson, with three new Canadian species (Coleoptera: Staphylinidae: Aleocharinae)

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Abstract. A new subgenus, *Hydrosmectomorpha* Klimaszewski and Webster, of the genus *Atheta* C. G. Thomson (Coleoptera: Staphylinidae: Aleocharinae) is erected to accommodate three new species and *Atheta newfoundlandica* (Klimaszewski and Langor). The new species are: *Atheta (Hydrosmectomorpha) meduxnekeagensis* Webster and Klimaszewski, **new species**; *Atheta (Hydrosmectomorpha) quebecensis* Webster and Klimaszewski, **new species**; *Atheta (Hydrosmectomorpha) vincenti* Webster and Klimaszewski, **new species**. The new species are described, illustrated, and a key is provided. *Atheta newfoundlandica* (Klimaszewski and Langor), was recently transferred from *Hydrosmecta* C.G. Thomson to an unspecified subgenus of *Atheta*. New habitat/collection data are presented for the treated species.

Key words. Cobblestone habitats, new species, North America, rove beetles.

Introduction

Intensive collecting of aleocharine rove beetles (family Staphylinidae) in New Brunswick, and recent sampling in British Columbia by the second author has yielded many new species, and new provincial and national records. In this contribution, we describe a new subgenus, *Hydrosmectomorpha*, a member of the large genus *Atheta* C.G. Thomson. *Atheta newfoundlandica* (Klimaszewski and Langor), which was formerly described in *Hydrosmecta* C.G. Thomson of Newfoundland (Klimaszewski et al. 2011), but transferred to *Atheta* (Klimaszewski et al., in press), is included in this subgenus. Members of this subgenus occur in cobblestone habitats along rivers, streams, and lakeshores. Our goal is to publish descriptions of the new species and present new collection and bionomic data. The new species were not included in our latest book treating 407 aleocharine species from eastern Canada (Klimaszewski et al., in press). The number of eastern aleocharine species is thus increased to 410 species.

Materials and Methods

All specimens in this study were dissected to examine the genital structures. Extracted genital structures were dehydrated in absolute alcohol, mounted in Canada balsam on celluloid micro-slides, and then pinned with the specimen from which they originated. Images of the entire body and the genital structures were taken using an image processing system (Nikon SMZ 1500 stereoscopic microscope; Nikon Digital Camera DXM 1200F, and Adobe Photoshop software).

In the locality data presented, information on separate labels is separated by a '//'.

Morphological terminology mainly follows that used by Klimaszewski et al. (in press). The ventral side of the median lobe of the aedeagus is considered to be the side of the bulbous containing the foramen mediale, the entrance of the ductus ejaculatorius, and the adjacent ventral side of the tubus of the median lobe with the internal sac and its structures (this part is referred to as the parameral side in some recent publications); the opposite side is referred to as the dorsal part.

Depository/institutional abbreviations

- CNCI** Canadian National Collection of Insects, Arachnids, and Nematodes, Agriculture and Agri-Food Canada, Ottawa, Ontario, Canada.
LFC Natural Resources Canada, Canadian Forest Service, Laurentian Forestry Centre, R. Martineau Insectarium, Quebec City, Quebec, Canada.
NBM New Brunswick Museum, Saint John, New Brunswick, Canada.
RWC Reginald Webster Collection, Charters Settlement, NB, Canada.
USNM United States National Museum, Washington, D.C., USA

USA state abbreviations follow those of the US Postal Service. Canadian provincial abbreviations used in the text are as follows:

- NB** New Brunswick
NF Newfoundland
QC Quebec

Genus *Atheta* C. G. Thomson

(Fig. 1–7)

Subgenus *Hydrosmectomorpha* Klimaszewski and Webster, new subgenus

Type species of subgenus. *Atheta (Hydrosmectomorpha) meduxnekeagensis* Webster and Klimaszewski, **new species.**

Etymology. *Hydrosmectomorpha*, meaning body like *Hydrosmecta*, an adjective derived from the generic name *Hydrosmecta* to which species of this subgenus are externally superficially similar. The gender is feminine.

Description. Body narrowly elongate, subparallel, slightly flattened (Fig. 8, 16, 24, 32); head rounded, pubescence on disc directed obliquely towards midline, postocular carina strong and complete, eyes large, each longer than postocular area of head in dorsal view; labrum shallowly emarginate apically (Fig. 1); antennomeres VIII–X clearly elongate (Fig. 8, 24, 32), or subquadrate to slightly elongate (Fig. 16); last maxillary palpomere short and needle-shaped (Fig. 7); ligula elongate, partially subdivided medially (Fig. 6); mandibles long and slender, internal edge of right mandible with a small or large tooth (Fig. 3, 5), and left one with or without median tooth (Fig. 2, 4); pronotum slightly transverse, about one fifth (0.2) wider than long, broadest at apical third, pubescence on disc directed anteriorly along midline, antero-laterad on each side forming arcuate lines, hind angles of disc evident to distinct, obtusely rounded, hypomera entirely visible in lateral view; elytra transverse, at suture 2/3 to 4/5 as long as wide, distinctly broader than pronotum, flat, shoulders rounded, subrectangular, posterior margin of each elytron broadly arcuate, latero-apical emarginations weakly defined, pubescence on disc directed obliquely posteriorly from suture; abdomen subparallel; legs long. *Male.* Tergite VIII with apical margin truncate and slightly

sinuate medially (Fig. 34), or sinuate and denticulate laterally and minutely denticulate at middle (Fig. 11), or obtusely produced laterally, without teeth and deeply emarginate medially (Fig. 26); tubus of median lobe of aedeagus moderately long, in lateral view with ventral margin straight to arcuate, apex moderately curved ventrad, internal sac structures small and inconspicuous, ventral margin of crista apicalis moderate to long, projecting at an angle to bulbus, rectangular basally in some specimens also at base of median lobe (Fig. 9, 17, 18, 25, 33). *Female*. Tergite VIII with apical margin truncate, sinuate or broadly emarginate (Fig. 13, 21, 28, 36); spermatheca small, capsule club-shaped, narrow or broad, stem moderately long, narrow, sinuate or straight and more or less swollen posteriorly (Fig. 15, 23, 30, 31, 38).

Discussion. *Hydrossectomorpha*, is distinguishable from other subgenera of *Atheta* by the following combination of characters: body narrow, subparallel and flattened; elytra markedly broader than remainder of body; distinctive pattern of pubescence on pronotum and elytra (described above); antennomeres VIII–X distinctly to slightly elongate; ligula weakly subdivided apically; legs long; apical margin of male tergite VIII lacking prominent teeth; spermatheca small, with stem short and simple, straight or sinuate; all known species occur among cobblestones and gravel along margins of clear, fast flowing rivers, near the outflow of brooks into rivers, and along lake margins with wave action.

The median lobe of the aedeagus in *Hydrossecta* has a blade-like, triangular projection at the base of the tubus in lateral view to which parameres are attached, this structure is narrowly elongate along ventrally flat part of bulbus, in *Hydrossectomorpha*. Male tergite VIII in *Hydrossecta* is truncate apically and not modified, while in *Hydrossectomorpha* it is truncate and slightly emarginate, deeply notched, or with minute teeth. The stem of spermatheca in *Hydrossecta*, is coiled posteriorly, broadly looped, or irregularly twisted, while in *Hydrossectomorpha* it is straight or slightly sinuate with small apical swelling. The external similarity of *Hydrossectomorpha* species (e.g., flattened body, similar pronotal pubescence pattern), to those of *Hydrossecta* represent convergent evolution and adaptation to live among cobblestones, gravel and sand along margins of clear, fast-flowing water.

Key to species of *Atheta* (*Hydrossectomorpha*)

1. Antennomeres VIII–X subquadrate to slightly elongate (Fig. 16); apical margin of male tergite VIII truncate and slightly (NB specimens) to strongly sinuate (BC specimens), and a small tooth near each lateral angle (Fig. 19a,b); apical part of median lobe of aedeagus very narrow and pointed and arcuate in lateral view, ventral margin of median lobe of aedeagus for the most part curved in lateral view (Fig. 17, 18); apical margin of female sternite VIII with broad medial emargination bordered on each side by an angular projection (Fig. 21); spermatheca small, capsule tubular and club-shaped, apical invagination small; stem curved at base of capsule, straight to small spherical posterior swelling (Fig. 23) **A. meduxnekeagensis Webster and Klimaszewski, new species**
- Antennomeres VIII–X distinctly elongate (Fig. 8, 24, 32); ventral margin of median lobe in large part straight in lateral view (Fig. 9, 25, 33); other structures not as above **2**
- 2(1). Antennomeres VIII–X each about twice as long as wide (Fig. 24); apical margin of male tergite VIII with broadly V-shaped median emargination forming two lobe-like processes, without lateral teeth (Fig. 26); apical margin of female tergite VIII truncate medially (Fig. 28); spermatheca with capsule broadly club-shaped, apical invagination small; stem short, straight or sinuate (Fig. 30, 31) **A. vincenti Webster and Klimaszewski, new species**
- Antennomeres VIII–X each less than twice as long as wide (Fig. 8, 32); other structures not as above **3**
- 3(2). Apical margin of male tergite VIII with two small lateral and six or many minute denticles near middle (Fig. 11); basal margin of male sternite VIII deeply emarginate medially (Fig. 12); median lobe of aedeagus in lateral view almost straight except apex bent abruptly ventrad (Fig. 9); apical margin of female tergite VIII distinctly broadly emarginate medially (Fig. 13); spermatheca highly sinuate (Fig. 15) . **A. newfoundlandica (Klimaszewski and Langor)**
- Apical margin of male tergite VIII sinuate, without denticles (Fig. 34); basal margin of male sternite VIII slightly emarginate medially (Fig. 35); median lobe of aedeagus in lateral

view broadly curved at base and at apex (Fig. 33); apical margin of female tergite VIII slightly emarginate medially (Fig. 36); spermatheca bent at middle, stem straight (Fig. 38) *A. quebecensis* Webster and Klimaszewski, new species

***Atheta (Hydrosmeptomorpha) newfoundlandica* (Klimaszewski and Langor)**

(Fig. 8–15)

Hydrosmeptomorpha newfoundlandica Klimaszewski and Langor, in Klimaszewski et al. 2011. Webster et al. 2012, Klimaszewski et al. (in press).

Diagnosis. Body subparallel, flattened (Fig. 8), length 2.8–3.4 mm; colour dark brown with antennae, legs and elytra paler, reddish- or yellowish-brown (Fig. 8); integument moderately glossy, forebody with fine, moderately dense punctation and faint meshed microsculpture; head slightly narrower than pronotum, eyes large but not protruding (Fig. 8); antennae moderately robust, all antennomeres slightly to distinctly elongate (Fig. 8); pronotum widest at apical third (0.52 mm) (Fig. 8); elytra flattened, distinctly elongate, at suture about as long as pronotum, broader than pronotum (0.61 mm at shoulders) (Fig. 8); abdomen subparallel, slightly widening apicad. *Male.* Apical margin of tergite VIII sinuate with two small lateral denticles, and variable number of minute denticles near middle (Fig. 11); sternite VIII deeply emarginate basally and parabolically rounded from base to apex (Fig. 12); median lobe of aedeagus in lateral view with tubus wide, ventral margin straight, apex abruptly bent ventrad (Fig. 9); in dorsal view bulbous large, ovoid, tubus broad, moderately long, triangular apically (Fig. 10). *Female.* Apical margin of tergite VIII with broad, shallow emargination medially (Fig. 13); sternite VIII broadly rounded apically (Fig. 14); spermatheca short, capsule broad, tubular and elbowed, apical invagination wide and deep, stem highly sinuate (Fig. 15).

Distribution. Origin: Nearctic. **CANADA:** NF, NB. **USA:** TN.

New record from Tennessee: USA, Tennessee, Fentress Co., Fallen Entrance Cave, 4 mi SSW Jamestown, 26.IX.03, J. Lewis (LFC) 1 female.

Habitat and collection data. *Habitat.* NB specimens were collected from among cobblestones along clear, rocky, river margins near the outflow of brooks. One individual was collected from the margin of a spring-fed brook among gravel on firm sand/clay/gravel mix near the outflow of the brook into a clear, rocky river. Others were collected on a partially shaded cobblestone island in a clear, fast flowing river. Specimens were usually found among cobblestones and gravel at water's edge. Klimaszewski et al. (2011) did not specify the habitat of NF specimens. *Collecting period.* V–VIII. *Collecting method.* Hand collecting from among cobblestones near water.

Comments. Externally, *A. newfoundlandica* somewhat superficially agrees with some characteristics of the genus *Hydrosmeptomorpha*, within which it was originally classified (Klimaszewski et al. 2011), but it has the median lobe of the aedeagus and the spermatheca of the *Atheta* type.

***Atheta (Hydrosmeptomorpha) meduxnekeagensis* Webster and Klimaszewski, new species**

(Fig. 16–23)

Holotype (male). Canada, New Brunswick, Carleton Co., Belleville “Meduxnekeag Valley Nature Preserve”, 46.1942°N, 67.6832°W, 9.VI.2008 R.P. Webster // River margin, among small cobblestones set in sand and fine gravel near water's edge (CNC). **Paratypes.** New Brunswick, Queens Co., Waterborough, Grand Lake at Youngs Cove, 45.96358°N, 65.99793°W, 4.VIII.2005, R.P. Webster // Lake margin, cobblestone beach, under cobblestones (RWC) 1 female; New Brunswick, Queens Co., Cambridge, Grand Lake at Whites Cove, 45.86795°N, 66.06415°W, 4.VIII.2005, R.P. Webster // Lake margin, cobblestone beach, under cobblestones (LFC) 2 males, 2 females, (RWC) 3 males, 4 females; New Brunswick, Queens Co., Grand Lake at Goat Island, 46.0110°N, 66.0133°W, 24.VII.2007, R.P. Webster // Lake margin, on cobblestone beach under cobblestones, (RWC) 1 male, 1 female; New Brunswick, Carleton Co., Belleville “Meduxnekeag Valley Nature Preserve”, 46.1942°N, 67.6832°W, 9.VI.2008 R.P. Webster // River margin, among small cobblestones set in sand and fine gravel near water's edge (LFC) 2 males, 3 females, (RWC)

5 males, 5 females; New Brunswick, Restigouche Co., Jacquet River Gorge PNA, 47.8257°N, 66.0768°W, 16.VI.2009 R.P. Webster // Balsam poplar forest, medium sized stream near outflow into Jacquet River on partially shaded cobblestone island among cobblestones (LFC) 1 female, (RWC) 2 males, 1 female; New Brunswick, Restigouche Co., Kedgwick Forks, 47.9085°N, 67.9057°W, 22.VI.2010, R.P. Webster // River margin, gravel bar, among gravel and cobblestones (RWC) 1 female; New Brunswick, Northumberland Co. Amostown, 46.5339°N, 66.2094°W, 11.VIII.2006, R.P. Webster, coll. // Margin of Miramichi River, among cobbles near water (RWC) 1 female.

Non-paratypes. Canada, British Columbia, N'Kwata Recreation Area at Nicola River, 511 m, elev., 50.1596°N, 121.0502°W, 2.VII.2015, R. Webster & M.A. Giguère // river margin, among cobblestones and gravel (LFC) 1 female, (RWC) 5 males, 6 females

Etymology. The species name refers to the Meduxnekeag River where the holotype and many paratypes were collected. Meduxnekeag is a Maliseet word meaning “rough or rocky at its mouth”, presumably applied to the mouth of the river itself. The entire length of this river in NB has a rocky margin including its mouth.

Diagnosis. Body subparallel, flattened (Fig. 16), length 2.6–3.0 mm (mean = 2.8 mm (N = 10), NB specimens); colour dark brown to almost black, with legs and elytra except for scutellar region paler, reddish- or yellowish-brown (Fig. 16); integument slightly glossy, forebody with fine, moderately dense punctation and faint meshed microsculpture; head slightly narrower than pronotum, eyes large and slightly protruding (Fig. 16); antennae moderately robust, antennomeres I–VII highly elongate, VIII–X slightly to distinctly elongate (Fig. 16); pronotum widest at apical third (0.51 mm) (Fig. 16); elytra distinctly elongate and broader than pronotum (0.61 mm, at shoulders), flattened, at suture about as long as pronotum (Fig. 16); abdomen subparallel, broadest before middle, gradually tapering apicad. *Male.* Apical margin of tergite VIII slightly (NB specimens) to distinctly (BC specimens) sinuate, with only one small lateral denticle on each side (Fig. 19a, b); apical margin of sternite VIII moderately produced, rounded (Fig. 20); tubus of median lobe of aedeagus in lateral view moderately wide, ventral margin arcuate in basal half, narrow and slightly curved ventrad apically (Fig. 17 BC, 18NB). *Female.* Apical margin of tergite VIII in NB specimens shallowly, broadly emarginate, angular near lateral margin (Fig. 21a), more produced, lobe-like laterally in BC specimens (Fig. 21b); sternite VIII broadly arcuate apically (Fig. 22); spermatheca short, capsule narrowly tubular and club-shaped, apical invagination small and shallow, stem straight to base with small globular swelling (Fig. 23).

Distribution. Origin: Nearctic. **CANADA:** BC, NB.

Habitat and collection data. *Habitat.* In NB, this species occurs in various cobblestone habitats along river and lake margins. Adults usually occurred among cobblestones and gravel near water's edge, often in areas with slowed current along fast flowing rivers where there was a build-up of fine debris and growth of algae on cobblestones. This species was also found along lake margins where wave action has created conditions similar to the flowing water of rivers. BC specimens were collected from a river margin among cobblestones and gravel. *Collecting period.* VI–VIII. *Collecting method.* Hand collecting from among cobblestones near river and lake margins.

Comments. *Atheta (H.) meduxnekeagensis* is most likely transcontinental in Canada, but cobblestone habitats are not sufficiently sampled for aleocharines across Canada, and at present there is a substantial gap in the known distribution of this species. The specimens from BC differ somewhat from those from NB and are tentatively associated with this species and therefore excluded from the paratype series. The specimens from BC have darker elytra, are on average larger (2.9–3.1 mm (mean = 3.06 mm (N = 8) vs 2.6–3.0 mm (mean = 2.8 mm (N = 10) for NB specimens, BC specimens have a larger aedeagus (0.48 mm in length vs 0.43 mm in NB specimens) and more curved apical part of median lobe of aedeagus in lateral view with somewhat differently shaped internal structures, apical margin of male tergite VIII is slightly (NB) and distinctly sinuate (BC), and female sternite is more deeply emarginate in BC specimens than those from NB. We therefore only tentatively associate the BC population with this species. Material from intervening areas of Canada should help resolve the taxonomic status of these, at present, disjunct populations.

***Atheta (Hydrosmetomorpha) vincenti* Webster and Klimaszewski, new species**

(Fig. 24–31)

Holotype (male). Canada, New Brunswick, Saint John Co., Fundy Trail Parkway, 45.4226°N, 65.4055°W, 16.VIII.2009, R.P. Webster, coll. // Big Salmon River, river margin among algae-covered gravel and cobblestones, sun-exposed area, (CNC). **Paratypes.** Canada, New Brunswick, Saint John Co., Fundy Trail Parkway, 45.4226°N, 65.4055°W, 16.VIII.2009, R.P. Webster, coll. // Big Salmon River, river margin among algae covered gravel and cobblestones, sun-exposed area (LFC) 1 female, (RWC) 3 males, 5 females; New Brunswick, Carleton Co., Belleville, Meduxnekeag Valley Nature Preserve, 46.1897°N, 67.6781°W, 31.VII.2009, R.P. Webster, coll. // Rich Appalachian hardwood forest, margin of shaded spring-fed brook among gravel on firm sand/clay/gravel mix (RWC) 1 male; New Brunswick, Madawaska Co., Baker Brook, 47.29719°N, 68.51226°W, 26.VII.2006, R. Capozzi & R. Webster, coll. // Saint John River island, among cobblestones near water (RWC) 1 male, 1 female.

Etymology. This species is named in honor of Vincent Webster who collected many aleocharine specimens in New Brunswick representing new taxa and new provincial records as well as many other new records from other families.

Diagnosis. Body subparallel, flattened, length 3.2–3.8 mm; colour dark brown to almost black, with legs and elytra, except for scutellar region, paler, yellowish-brown (Fig. 24); integument moderately glossy, forebody with fine, moderately dense punctation and faint meshed microsculpture; head slightly narrower than pronotum, eyes large and slightly protruding; antennae moderately robust, all antennomeres distinctly elongate (Fig. 24); pronotum widest at apical third (0.59 mm), (Fig. 24); elytra flattened, distinctly elongate, at suture about as long as pronotum, broader than pronotum (0.73 mm at shoulders); abdomen subparallel, widest at apical third. *Male.* Apical margin of tergite VIII obliquely produced laterally, with two lobe-like processes forming a variable, obtuse angular emargination medially (Fig. 26); sternite VIII moderately deeply emarginate, apical margin broadly truncate, rounded laterally (Fig. 27); tubus of median lobe of aedeagus in lateral view moderately wide, ventral margin straight to apical third, then moderately curved ventrad to narrow apex (Fig. 25). *Female.* Apical margin of tergite VIII obtusely produced laterally, truncate medially (Fig. 28); apical margin of sternite VIII obliquely produced, broadly rounded apically (Fig. 29); spermatheca short, capsule club-shaped with shallow apical invagination, stem narrow and straight or slightly sinuate (Fig. 30, 31).

Distribution. Origin: Nearctic. **CANADA:** NB.

Habitat and collection data. *Habitat.* Most specimens are from a cobblestone river margin (clear, fast flowing medium-sized river). Adults were found among algae-covered gravel and cobblestones in a sun-exposed area near flowing water. A few were collected from among cobblestones along a large river; one individual was collected from the margin of a shaded spring-fed brook among gravel on firm sand/clay/gravel mix flowing into the Meduxnekeag River. *Collecting period.* VII–VIII. *Collecting method.* Hand collecting from among cobblestones near rivers and streams.

***Atheta (Hydrosmetomorpha) quebecensis* Webster and Klimaszewski, new species**

(Fig. 32–38)

Holotype (male). Canada, Quebec, Bellechase Co., St. Raphael at Rivière du Sud, 46.8071°N, 70.7377°W, 27.VIII.2009, R.P. Webster, coll. // river margin near waterfall, splashing exposed bedrock with moss near fast flowing water above waterfall, (CNC). **Paratypes.** Same locality data as the holotype (RWC) 1 female.

Etymology. This species name derives from the name of the province of Quebec, where the original series was found.

Diagnosis. Body subparallel, flattened, length 3.6–3.8 mm; colour dark brown to almost black, with legs and elytra except for scutellar region paler, yellowish-brown (Fig. 32); integument moderately glossy, forebody with fine, moderately dense punctation and faint meshed microsculpture; head slightly narrower than pronotum, eyes large and slightly protruding; antennae moderately robust, all antennomeres at

least slightly elongate (Fig. 32); pronotum subquadrate, widest at apical third (0.62 mm); elytra flattened, distinctly elongate and broader than pronotum (0.77 mm, at shoulders), at suture about as long as pronotum; abdomen subparallel, broadest at apical third. *Male*. Tergite VIII with apical margin slightly sinuate, without teeth (Fig. 34); sternite VIII arcuately emarginate basally and broadly rounded apically (Fig. 35); tubus of median lobe of aedeagus in lateral view moderately wide, ventral margin curved basally, then straight to narrow, slightly curved apex (Fig. 33). *Female*. Apical margin of tergite VIII slightly sinuate, shallowly emarginate medially (Fig. 36); sternite VIII shallowly emarginate at base, apical margin truncate medially, rounded laterally (Fig. 37); spermatheca short, capsule club-shaped with deep apical invagination, stem narrow and straight, with spherical swelling posteriorly (Fig. 38).

Distribution. Origin: Nearctic. **CANADA:** QC.

Habitat and collection data. *Habitat.* Found along margin of fast-flowing river above a waterfall. Adults were in exposed moss covered bedrock. The rarely collected *Bembidion (Pseudoperypus) rufotinctum* Chaudoir (Carabidae) occurred in the same habitat. *Collecting period.* VIII. *Collecting method.* Collected by splashing exposed moss-covered bedrock in river.

Acknowledgments

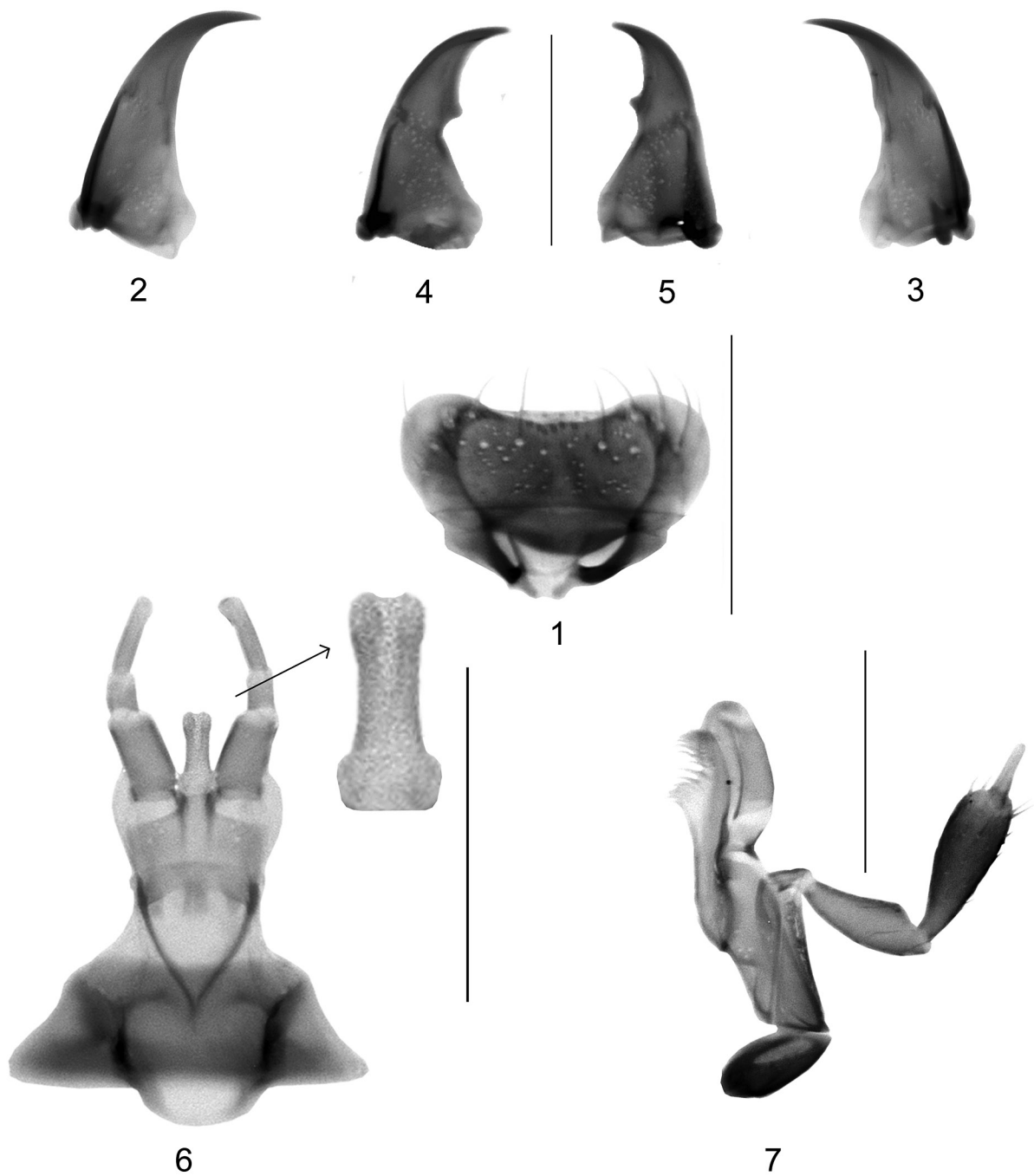
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Literature Cited

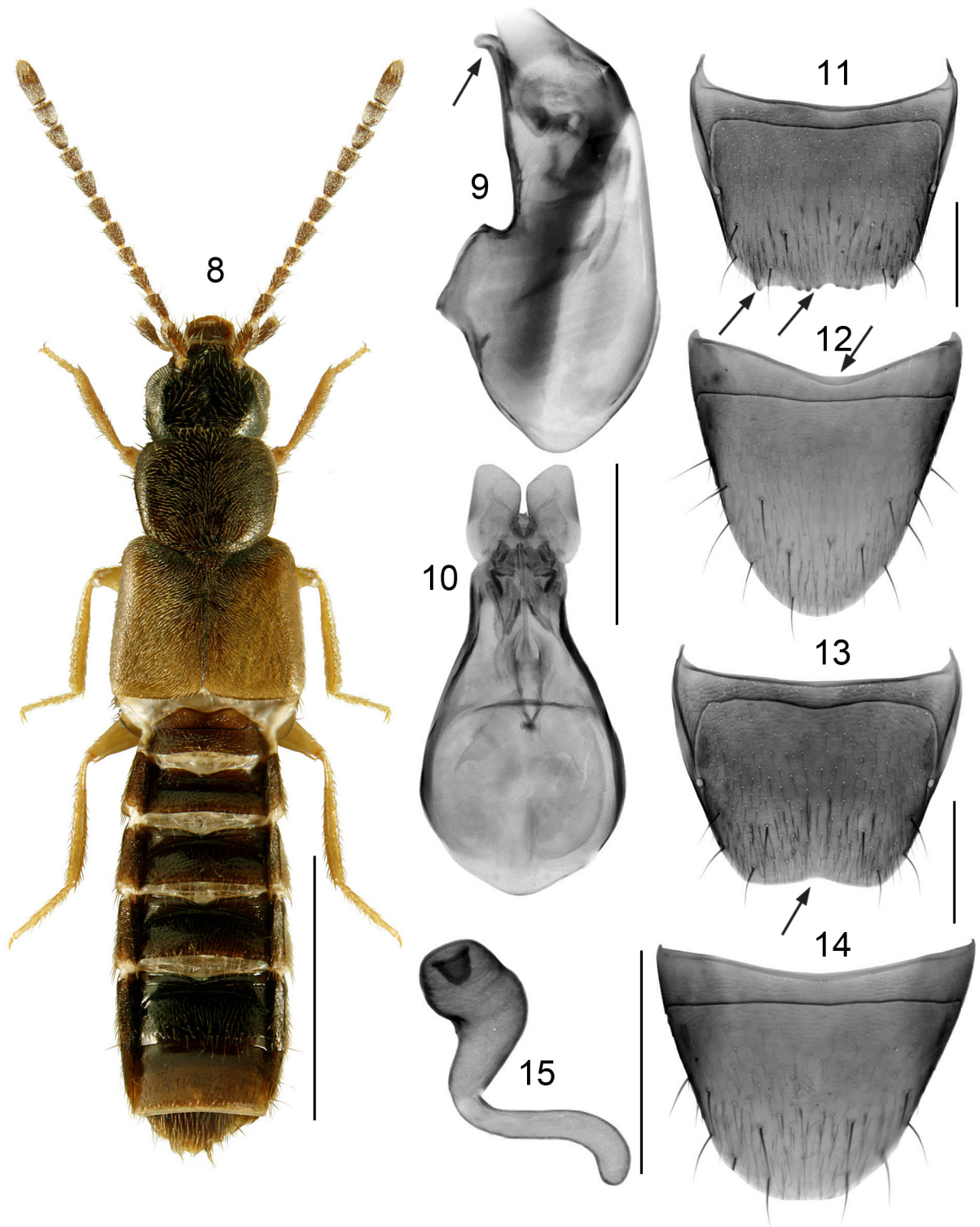
- Klimaszewski, J., D. Langor, G. Pelletier, C. Bourdon, and L. Perdereau. 2011. Aleocharine beetles (Coleoptera, Staphylinidae) of the province of Newfoundland and Labrador, Canada. Pensoft Series Faunistica No. 98. Pensoft; Sophia-Moscow. 313 pp.
- Klimaszewski, J., R. P. Webster, and A. Davies. 2017. Genus *Hydrosmecta* C. G. Thomson: a review of species occurring in eastern Canada (Coleoptera, Staphylinidae, Aleocharinae). *Insecta Mundi* 0593: 1–17.
- Klimaszewski, J., R. P. Webster, D. W. Langor, A. Brunke, A. Davies, A. F. Newton, C. Bourdon, M. Labrecque, J. A. Dorval, and J. H. Frank. (in press). Aleocharine rove beetles of eastern Canada (Coleoptera, Staphylinidae, Aleocharinae): a glimpse of megadiversity. Springer International Publishing AG., New York.
- Webster, R. P., J. Klimaszewski, J. D. Sweeney, and I. DeMerchant. 2012. New Staphylinidae (Coleoptera) records with new collection data from New Brunswick, and an addition to the fauna of Quebec, Canada: Aleocharinae. p. 83–118. *In*: J. Klimaszewski and R. Anderson (eds.). *Biosystematics and Ecology of Canadian Staphylinidae (Coleoptera) II*. *ZooKeys* 186: 1–348.

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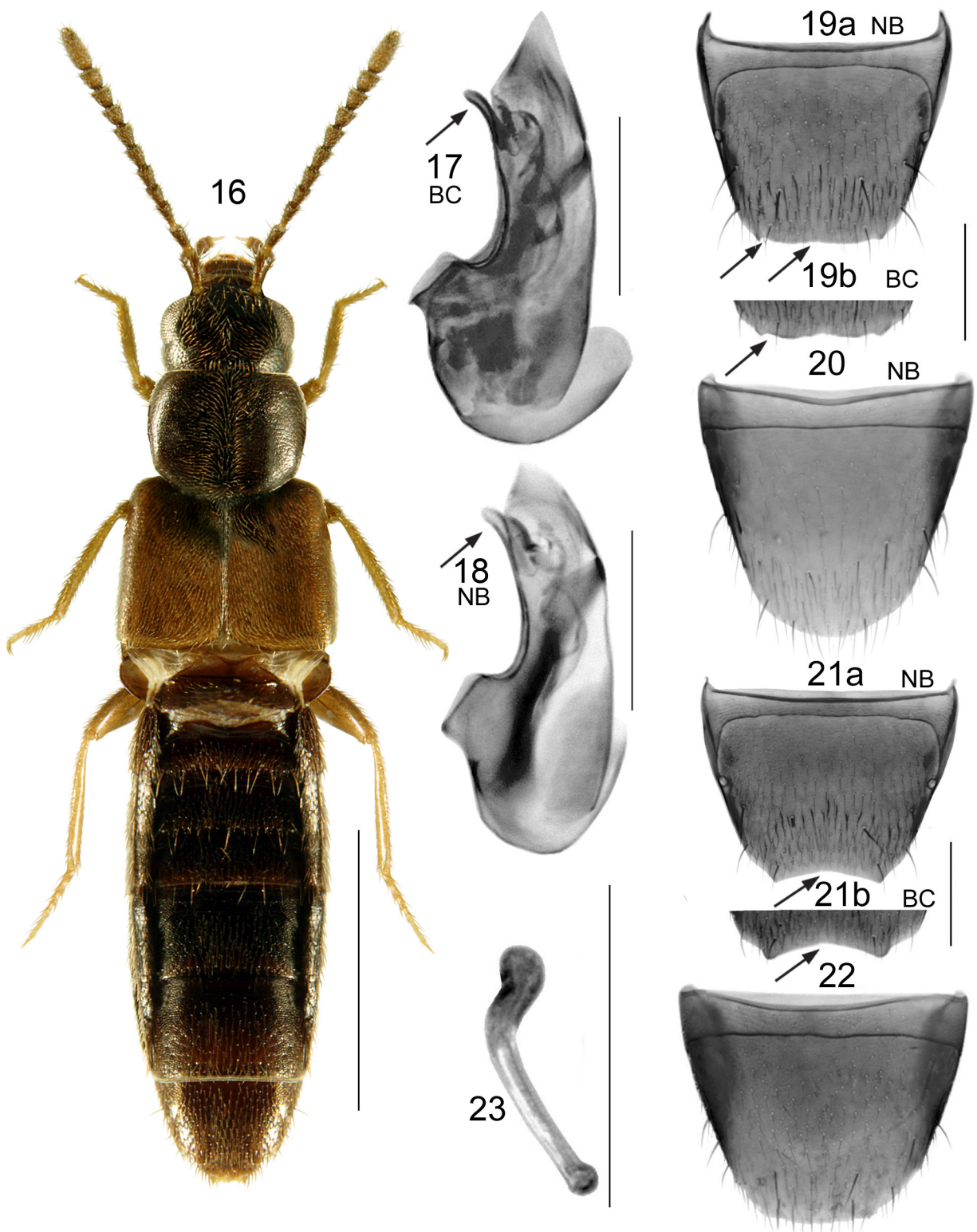
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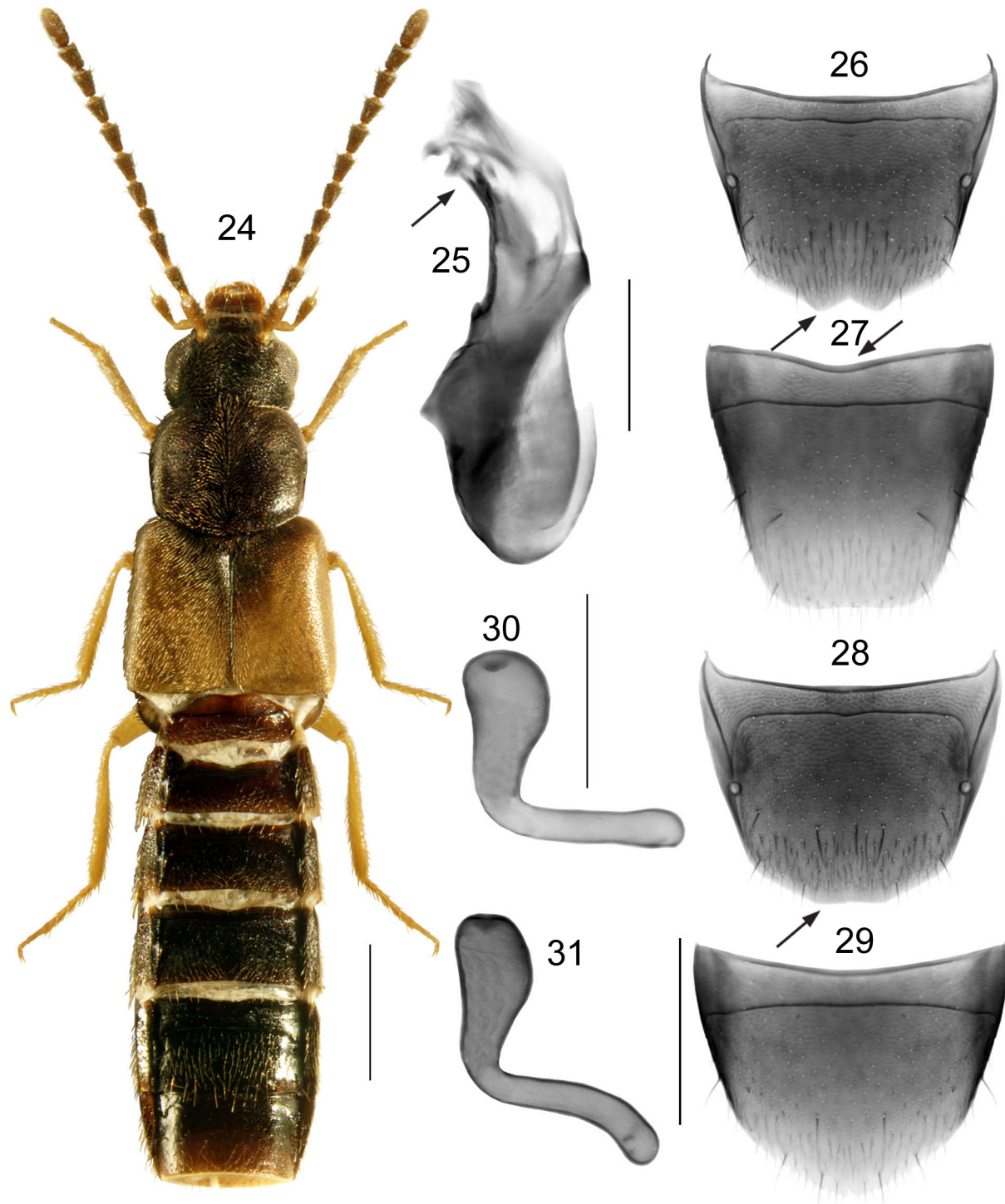
Figures 1–7. Mouthparts. **1)** Clypeus of *Atheta (H.) newfoundlandica*. **2, 3)** Mandibles of *Atheta (H.) newfoundlandica*. **4, 5)** Mandibles of *Atheta (H.) meduxnekeagensis*. **6)** Mentum with labial palpi and ligula. **7)** Maxilla with maxillary palpus. Scale lines = 0.2 mm.



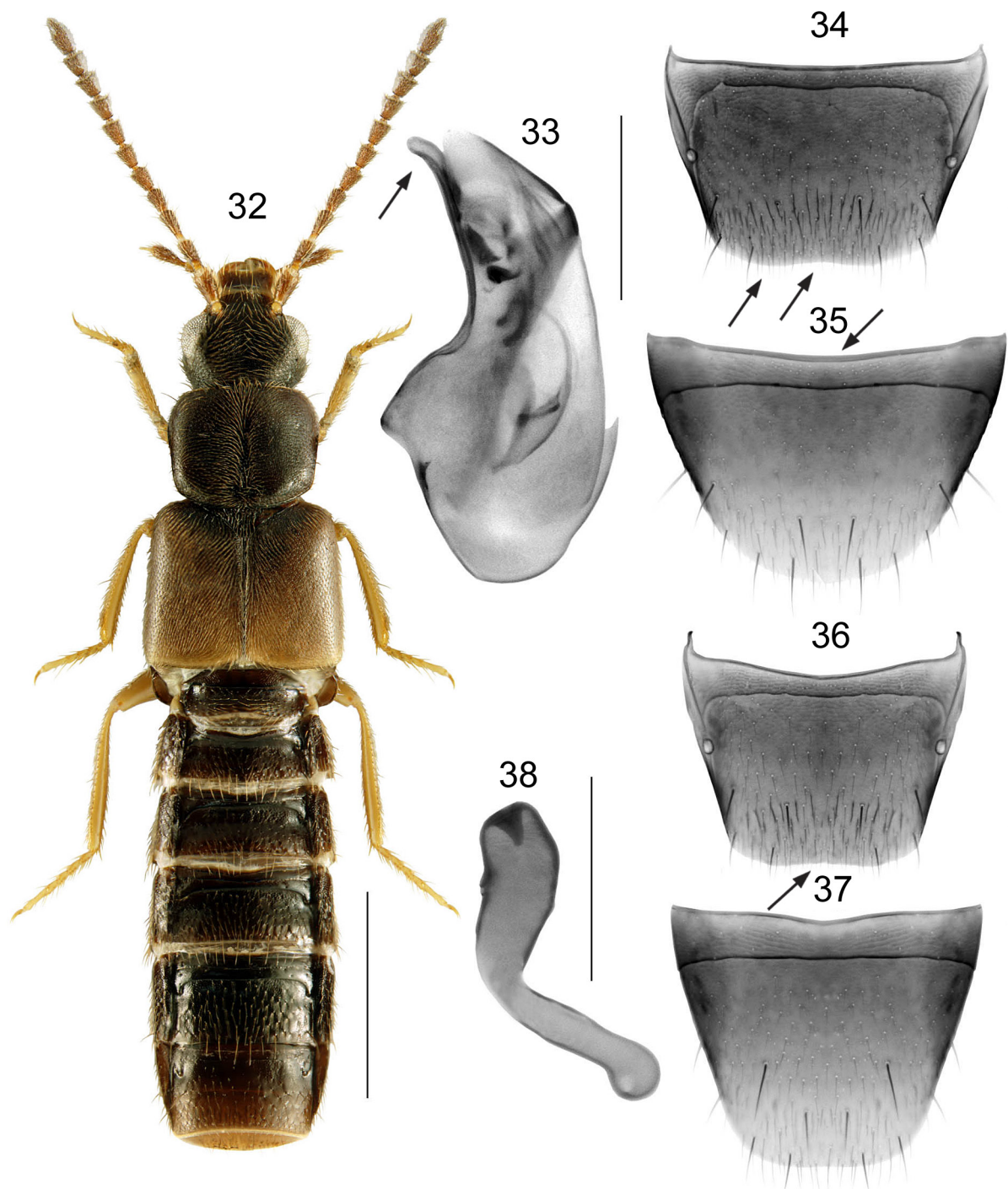
Figures 8–15. *Atheta (H.) newfoundlandica* (Klimaszewski and Langor). **8)** Habitus in dorsal view. **9)** Median lobe of aedeagus in lateral view. **10)** Median lobe of aedeagus in dorsal view. **11)** Male tergite VIII. **12)** Male sternite VIII. **13)** Female tergite VIII. **14)** Female sternite VIII. **15)** Spermatheca. Scale line for habitus = 1 mm, remaining scale lines = 0.2 mm. Arrows indicate important diagnostic features.



Figures 16–23. *Atheta (H.) meduxnekeagensis* Webster and Klimaszewski, sp. nov. (NB specimen). **17, 18)** median lobe of aedeagus in lateral view (17BC, 18 NB). **19a, b)** Male tergite VIII (a - NB, b - BC). **20a, b)** Male sternite VIII. **21)** Female tergite VIII (a - NB, b - BC). **22)** Female sternite VIII. **23)** Spermatheca. Scale line for habitus = 1 mm, remaining scale lines = 0.2 mm. Arrows indicate important diagnostic features.



Figures 24–31. *Atheta (H.) vincenti* Webster and Klimaszewski, sp. nov. **24)** Habitus in dorsal view. **25)** Median lobe of aedeagus in lateral view. **26)** Male tergite VIII. **27)** Male sternite VIII. **28)** Female tergite VIII. **29)** Female sternite VIII. **30, 31)** Spermatheca. Scale line for habitus = 1 mm, remaining scale lines = 0.2 mm. Arrows indicate important diagnostic features.



Figures 32–38. *Atheta (H.) quebecensis* Webster and Klimaszewski, sp. nov. **32)** Habitus in dorsal view. **33)** Median lobe of aedeagus in lateral view. **34)** Male tergite VIII. **35)** Male sternite VIII. **36)** Female tergite VIII. **37)** Female sternite VIII. **38)** Spermatheca. Scale line for habitus = 1 mm, remaining scale lines = 0.2 mm. Arrows indicate important diagnostic features.