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New species of Heteroceridae from Kenya and Zambia (Insecta, Coleoptera)

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A b s t r a c t : A new species of Heteroceridae: *Augyles davranogloui* nov.sp. from Kenya and *Heterocerus havai* nov.sp. from Zambia are described, illustrated and compared with similar species. The occurrence of *A. cribratellus* (FAIRMAIRE, 1893), *A. niloticus* (GROUVELLE, 1896), *A. pallens* (CHARPENTIER, 1965), *H. medius* CHARPENTIER, 1965, *H. incertus* GROUVELLE, 1896 in Kenya, *H. elongatus* GROUVELLE, 1896 and *H. ornatus* GROUVELLE, 1906 in Kenya and Zambia and *H. thebaicus thebaicus* GROUVELLE, 1896 in Zambia are confirmed.

K e y w o r d s : Coleoptera, Heteroceridae, taxonomy, new species, Kenya, Zambia.

Introduction

During a study of Heteroceridae collected by M. Snížek (České Budějovice, Czech Republic) from eighteen localities in Kenya, S. Prepsl (Zastávka u Brna, Czech Republic) from three localities in Kenya and one locality in Zambia and a collection of a small series of Heteroceridae deposited at the NHML from five localities in Zambia, I identified eight species, of which two were new to science: *Augyles davranogloui* nov.sp. from Kenya and *Heterocerus havai* nov.sp. from Zambia. The new species are described in present paper, and additional locality data are provided for the remaining eight species.

Material and methods

Specimens were studied using a Meiji techno RZ stereomicroscope equipped with coaxial vertical illuminator. Photographs of the habitus, spiculum gastrale and aedeagus were taken with 1.9 and 3.3 magnification objective lens respectfully, in conjunction with a Canon EOS 70D camera. Stacked images were combined using Helicon Focus 5.3 software, and were then traced and repainted in Corel draft 9 Software. Separate labels are indicated by double slashes, locality data are cited verbatim in "quotation marks", and author's remarks are given in square brackets.

The following acronyms are used in the text to indicate the depository of the material examined:

CSUColl. S. Skalický, Ústí nad Orlicí, Czech Republic

NHMLThe Natural History Museum, London, United Kingdom

Taxonomy

Heterocerus havai nov.sp.

Type material: Holotype ♂: "ZAMBIA 529m Nkwali, S. Luangwa GMA S13°07'03";E31°44'16" 10-18.xi. [20]12 Actinic Light leg. Smith, R & Takano, H" // "NHMUK 013317339" [RQ code] // "BMNH(E) 2015-19" // "HOLOTYPE *Heterocerus havai* SKALICKÝ det. Skalický 2019" [red label] NHML. Paratype ♂: the same data as holotype only, second label: "NHMUK 013317340" [RQ code], determinate label is: "PARATYPE *Heterocerus havai* SKALICKÝ det. Skalický 2019" [red label] CSU.

Description: Holotype ♂: Total length 3.65 mm (measured from labral apex); elytra 2.65 mm long, 1.40 mm wide across their lateral margin. Ground colour pale brown, elytra and pronotum with black to brown pattern as in Fig. 1, labrum, head and scutellum black, protibiae darker laterally. Ventral surface brown. Visible part of labrum (Fig. 3) wider than long (ratio 1.25: 1), triangular, lateral angles rounded, anterior angles truncate, softly serrate in median portion, surface of labrum finely granular, with dense short yellowish setae. Mandibles (Fig. 3) somewhat curved, bluntly dentate, dorsal subapical tooth imperceptible, rounded, dorsal process of dental lobe short, provided with a simple spike and a pronounced sharp lateral horn. Prostheca with fine teeth on dental lobe, without a prosthecal notch. Antennae 11-segmented, with a 7-segmented club, scape triangular, pedicel oval, antennomeres 1 and 2 with sparse, long erect setae. Clypeus (Fig. 3) with a pair of relatively long and set far apart anterior horns. Anterior margin of clypeus shallowly emarginate, with dense, short, yellowish setae intermixed with long erect ones. Head finely granular, setae sparse, short, intermixed with long erect setae above eyes. Pronotum oval, wider than long (ratio 1.65: 1), as wide as base of elytra, pronotal base completely rimmed; lateral margins serrated; anterior margin with depressions under the eyes. Surface of pronotum very finely granulated without intermixed longer punctures; setae sparse, short, yellowish. Scutellum pointed, triangular, about 1.5 times longer than wide, anterior margin convex. Elytra with distinctive longitudinal furrows with scutellar depressions and well-developed humeral depressions extending obliquely towards suture reaching midlength of elytron. Lateral margin and base of elytra coarse and distinctly dentate, teeth most pronounced around the shoulders (Fig. 2). Surface of elytra microgranular, with intermixed punctures approximately twice large as eye facets. Setae on elytra yellowish, double, short adjacent and sparse long semi-erected. Epipleural ridges absent. Ventral surface sparsely setose. Metaventricle with post-mesocoxal ridge. Mesoventrite with three short, square and blunt spines in front of each mesocoxa. Protibia with 8 stout spines along its lateral margin and two spines at its inner apical angle, meso- and metatibia with an uncertain number of thin weak spines (in paratype mesotibiae with 7 and metatibia with 8 weak spines). Tibiae with dense, long setae. Post-metacoxal line incomplete. Stridulatory arch marked, with poor visible of striae. Spiculum gastrale 0.70 mm long, V-shaped as in Fig. 4, arms firmly connected apically. Aedeagus 0.80 mm long, well sclerotized, shape as in Figs 5-8. Parameres long, firmly connected to phallobasis; supporting sheath border posteriorly. Penis without processus accessorius, without internal sac.

Female: unknown.

Differential diagnosis: Due to the shape of the aedeagus (Parameres firmly connected with phallobasis; penis simple without processus accessorius and inter-

nal sac) *H. havai* nov.sp. belongs to the *breddoi* group sensu CHARPENTIER (1965). This group contained nine previously described taxa in Ethiopian region: *H. abyssinicus* MAMITZA, 1930 (Ethiopia, Kenya, Tanzania, Zaire, Zambia), *H. breddoi* MAMITZA, 1931 (Botswana, Chat, Congo, Namibia, Zaire), *H. denticulatus* MAMITZA, 1930 (Benin, Congo, Nigeria, Zaire), *H. fairmairei* GROUVELLE, 1906 (Madagascar), *H. meridionalis* PÉRINGUEY, 1892 (South Africa), *H. pavliceki* SKALICKÝ, 1999 (Namibia), *H. peringueyi* GROUVELLE, 1919 (South Africa), *H. sennarensis* GROUVELLE, 1909 (Mali, Nigeria, Sudan, Zambia) and *H. snizeki* SKALICKÝ, 1996 (Kenya, Tanzania) (MASCAGNI & MONTE (2001, 2002, 2003a, 2003b, 2005), SKALICKÝ (1996, 1999)). The morphology of male genitalia and spiculum gastrale of *H. havai* nov.sp. differs from all above mentioned species, the most similar species with respect to external characters being *H. meridionalis* (mandible with pronounced sharp lateral horn). It differs from the above-mentioned species in the elytral pattern, absence of dentate of shoulders and lateral margins of pronotum and distribution. Two species: *H. denticulatus* and *H. sennarensis* have dentate of shoulders, but not dentate lateral margins of pronotum as *H. havai* nov.sp. (see Figs 15,16, 40, 47, 71, 72, 73, 114, 116 and 117 in CHARPENTIER (1965) and Figs 1-8 in this paper).

E t y m o l o g y : The new species is named after my friend, Czech coleopterologist (Coleoptera: Dermestidae) Jiří Háva (Únětice u Prahy, Czech Republic).

***Augyles davranogloui* nov.sp.**

T y p e m a t e r i a l : Holotype ♂: "Kenya E, 600m E of Mwingi Sosoma, 27.11.2011 Snížek lgt" // "HOLOTYPE *Augyles davranogloui* Skal. Det. Skalický 2019" [red label] CSU. Allotype ♀: the same data as holotype only, second determinate label is: "ALLOTYPE *Augyles davranogloui* Skal. Det. Skalický 2019" [red label] CSU, Paratype ♀: the same data as holotype only, second determined label is: "PARATYPE *Augyles davranogloui* Skal. Det. Skalický 2019" [red label] NHML.

D e s c r i p t i o n : Holotype ♂: Total length 2.90 mm (to apex of labrum); elytra 1.80 mm long, 0.70 mm wide across shoulders. Ground colour light chestnut brown without any distinct pattern, labrum darker, eyes black. Labrum (Fig. 9) short, visible part wider than long (ratio 1.35: 1), lateral margins almost parallel; surface finely granulated, setae irregular semi-erect, yellowish and quite long. Mandibles (Fig. 9) short and robust, dorsal subapical tooth short, rounded, dental lobe with two rounded spines. Prostheca with teeth on dental lobe, without prosthecal notch. Antennae 11-segmented, with a 7-segmented club, pedicel oval, scape and pedicel with sparse long erect setae. Head very finely granulated, setae as in labrum. Clypeus (Fig. 9) without pair of anterior horns, anterior margin deeply emarginate, setae as in head. Pronotum as wide as the base of elytra, oval, pronotal base completely rimmed; surface densely regularly granular, punctures approximately as large as 1.5 times eye facets; setae sparse, short, erect, light brown. Scutellum pointed, triangular, lateral margins straight. Elytra with feebly-marked three longitudinal furrows in each elytron (they are clearly visible in wet specimens), without scutellar depressions, humeral depressions shallow and short. Surface of elytra microgranular, with intermixed coarse punctures approximately 2.5 as large as eye facets. Coarse punctures irregular. Setae on elytra light brown, short, erect without longer setae. Epipleural ridges absent. Metaventricle with post-mesocoxal ridge. Mesoventricle with three small rounded spines placed far apart in front of each mesocoxa. Ventral surface sparsely setose. Protibia with 10 stout spines along its lateral margin and two

short spines at its inner apical angle, mesotibia with 8 weak and metatibia with 7 thin spines. Tibiae with dense, long setae. Abdomen with complete post-metacoxal ridge. Stridulatory arch marked, without striae. Spiculum gastrale 0.60 mm long, V-shaped as in Fig. 10, arms narrow, firmly connected apically. Aedeagus 0.50 mm long, well-sclerotized; parameres short and completely fused together, firmly connected with phallobasis, penis without internal sac and processus accessories; shape of aedeagus as in Figs. 11-14.

Allotype ♀: The same diameter as in holotype. Elytra without longitudinal ridges. Externally similar to male.

Differential diagnosis: The shape of the aedeagus, the presence of a complete post-metacoxal ridge, antennomere number and the absence of clypeal horns in the male of *A. davranogloui* nov.sp. belongs to the *parvus* group sensu CHARPENTIER (1965). In the Ethiopian region, only two widely distributed representatives of this group are known: *A. parvus* (GROUVELLE, 1909) and *A. brevisculus* (CHARPENTIER, 1962) and the new species is probably related to *A. brevisculus*. The latter species differs from *A. davranogloui* by its ground colour and elytral pattern (reddish brown to black, dark specimens with an exceedingly diffuse, pale apical spot) and in the morphology of male genitalia (see Figs. 80 and 125 in CHARPENTIER (1965) and Figs 9-14 in this paper).

Etymology: The new species is named in honour of Leonidas-Romanos Davranoglou, an excellent Greek entomologist who specializes in hemipteran morphology and taxonomy.

Distributional notes

Note: Unless otherwise stated, the specimens are deposited at CSU.

A. cribratellus (FAIRMAIRE, 1893)

Material examined: "KENYA E 27.11.2011 E of Mwingi Sosoma 600m Snížek lgt." 20 spec; "Kenya Rift Valley 56km SW Kiserian 22.IV.2018 S. Prepsl leg" 130 spec.

Distribution: Eritrea, Ethiopia, Kenya, Somalia, Tanzania, Uganda.

A. niloticus (GROUVELLE, 1896)

Material examined: "KENYA Eastern E of Thika W of Mwingi 6.4.2007 Snížek lgt." 6 spec; "KENYA Eastern N of Nguni Ngomeni 7.4.2007 Snížek lgt." 13 spec; "KENYA Eastern N of Nguni Ngomeni 19.-22.4.2007 Snížek lgt." 1 spec; "KENYA E, E of Mwingi Sosoma 600m 27.11.2011 Snížek lgt." 2 spec; "KENYA CCE E of Garsen W of Witu 19.12.2009 Snížek lgt." 1 spec; "KENYA NE, S of Garissa Bura env. 4.12.2010 Snížek lgt." 11 spec; "KENYA Rift Valley 5 km N of Archer's Post 29.IV.2018 S. Prepsl lgt." 1 spec; "KENYA SE Lamu prov., E of Garsen 11.IV.2004 Snížek lgt." 1 spec; "Kenya Rift Valley 56km SW Kiserian 22.IV.2018 S. Prepsl leg." 8 spec.

Distribution: Algeria, Egypt, Ghana, Kenya, Morocco, Namibia, Saudi Arabia, Senegal, Sudan, Yemen, Zaire, Zambia, Zimbabwe.

***A. pallens* (CHARPENTIER, 1965)**

Material examined: "KENYA E 27.11.2011 E of Mwingi Sosoma 600m Snížek lgt." 11 spec; "KENYA Eastern N of Nguni Ngomeni 7.4.2007 Snížek lgt." 23 spec; "KENYA, Eastern E of Thika Kangonde 6.4.2007 Snížek lgt." 2 spec; "KENYA S.E. Tana riv. Prov. 14 km N of Garsen 9.IV. 2004 M. Snížek lgt." 29 spec.

Distribution: Kenya, Mosambique, South Africa, Zambia, Zimbabwe.

***H. elongatus* GROUVELLE, 1896**

Material examined: "KENYA SE Taita Hills NE Voi River 15.4.2007 Snížek lgt." 1 spec; "KENYA SE Lamu prov. E of Garsen 11.IV.2004 Snížek lgt." 79 spec; "KENYA S.E. Tana riv. Prov. 14 km N of Garsen 9.IV. 2004 M. Snížek lgt." 40 spec; "KENYA CCE E of Garsen W of Witu 19.12.2009 Snížek lgt." 1 spec; "KENYA, Coast NW of Garsen 22.4.2008 Snížek lgt." 1 spec; "KENYA, Coast E of Garsen Wolf Witu 21.4.2008 Snížek lgt." 2 spec; "KENYA Eastern N of Nguni Ngomeni 7.4.2007 Snížek lgt." 7 spec; "KENYA, Coast E of Garsen Wolf Witu 7.12.2008 Snížek lgt." 2 spec. "ZAMBIA-WEST Kamoa, 2.-5.XII.2016 S. Prepsl leg" 12 spec. "ZAMBIA, 1340m, Jiwundu Swamp, 11°51'54''S, 25°33'20''E, 25-30.x.2017., Actinic Light Trap." // "Carter, M., Loiyd, A., miles, W., Oram, D., Smith, R. leg., ANHRT: 2017-27" // "MZ-011 BMNH(E) 2017-194" // "NHMUK" [serial number and RQ code] 1 spec (NHML).

Distribution: Angola, Benin, Botswana, Burkina Faso, Cameroon, Cape Verde, Central Africal Republic, Côte d'Ivoire, Congo, Ethiopia, Gambia, Ghana, Kenya, Liberia, Madagascar, Malawi, Mali, Mauritania, Mosambique, Namibia, Niger, Nigeria, Senegal, Somalia, South Africa, Sudan, Tanzania, Togo, Zaire, Zambia, Zimbabwe.

***H. incertus* GROUVELLE, 1896**

Material examined: "KENYA Eastern E of Thika W of Mwingi 6.4.2007 Snížek lgt." 2 spec; "KENYA, Eastern E of Thika Kangonde 6.4.2007 Snížek lgt." 5 spec.

Distribution: Angola, Côte d'Ivoire, Congo, Ethiopia, Kenya, Madagascar, Nigeria, Senegal, Seychelles, South Africa, Tanzania, Uganda, Zaire, Zambia, Zimbabwe.

***H. medius* CHARPENTIER, 1965**

Material examined: "KENYA NE, S of Garissa Bura env. 4.12.2010 Snížek lgt." 13 spec; "KENYA Eastern N of Nguni Ngomeni 19.-22.4.2007 Snížek lgt." 1 spec; "KENYA Eastern N of Nguni Ngomeni 7.4.2007 Snížek lgt." 33 spec; "KENYA S.E. Tana riv. Prov. 14 km N of Garsen 9.IV. 2004 M. Snížek lgt." 43 spec; "KENYA SE Lamu prov. E of Garsen 11.IV.2004 Snížek lgt." 6 spec.

Distribution: Chad, Egypt, Ethiopia, Mauritania, Niger, Nigeria, Senegal, Somalia, Sudan, Tanzania, Uganda.

***H. ornatus* GROUVELLE, 1906**

Material examined: "KENYA SE, W of Mombasa S of Mackinnon Road, 12.14.-4.20017 Snížek lgt." 1 spec; "KENYA S.E. Tana riv. Prov. 14 km N of Garsen 9.IV. 2004 M. Snížek lgt." 5 spec; "KENYA Eastern E 729 Sosma 202 km E of Thika 11.5.2007 Snížek lgt." 1 spec; "KENYA Eastern N of Nguni Ngomeni 19.-22.4.2007 Snížek lgt." 7 spec; "KKENYA Eastern E of Thika W of Mwingi 6.4.2007 Snížek lgt." 1 spec; "KENYA CEE NW of Garsen 14.-17.12.2007 Snížek lgt." 1 spec; "KENYA NE, S of Garissa 10 km S of Hola 27.4.2011 Snížek lgt." 1 spec; "KENYA Coast Garissa N of Hola 25.4.2008 Snížek lgt." 2 spec; "KENYA, Coast E of Garsen Wolf Witu 7.12.2008 Snížek lgt." 9 spec; "KENYA NE, S of Garissa Bura env. 4.12.2010 Snížek lgt." 7 spec; "KENYA S Voi 11.1997 Lgt. M. Snížek" 10 spec; "KENYA, Coast E of

Garsen Wolf Witu 21.4.2008 Snižek lgt." 1 spec; "KENYA SE Lamu prov, E of Garsen 11.IV.2004 Snižek lgt." 39 spec; "KENYA 56 km S Hola 1.V.2017 S. Prepsl leg." 1 spec. "ZAMBIA-WEST Kamoia, 2.-5.XII.2016 S. Prepsl leg" 4 spec; "ZAMBIA 529m Nkwali, S. Luangwa GMA S13°07'03''; E31°44'16'' 10-18.xi.2012; Light Trap Edward's Funnel leg. Smith, R & Takano, H" // "BMNH(E) 2013-71" [serial number] 7 spec (NHML); "ZAMBIA 1187m Kabwe Kasanka N.P. S12°32'28''; E30°12'42'' 30.xi. - 1.xii.2012; Light Trap Edward's Funnel leg. Smith, R & Takano, H" // "BMNH(E) 2013-71" [serial number] 5 spec (NHML); "ZAMBIA 1191m Kasanka River Pontoon, Kasanka N.P.; 2-4.xii.2012 S12°34'23''; E30°14'05'' Light Trap Edward's leg. Smith, R & Takano, H" // "MNH(E) 2013-71" [serial number] 1 spec (NHML).

Distribution: Botswana, Guinea, Kenya, Madagascar, Mozambique, Namibia, Somalia, South Africa, Tanzania, Zambia, Zimbabwe.

***H. thebaicus thebaicus* GROUVELLE, 1996**

Material examined: "ZAMBIA, 1400m, Hillwood, Ikelenge, 11°16'02''S, 24°18'59''E, 30.x.-3.xi.2017., Actinis Light Trap.," // "Carter, M., Lloyd, A., Miles, W., Oram, D., Smith, R. leg., ANHRT: 2017:27, ZM-011, BMNH(E) 2017-194" // "NHMUK" [serial number and RQ code] 7 spec (NHML); "ZAMBIA 529m Nkwali, S. Luangwa GMA S13°07'03''; E31°44'16'' 10-18.xi.2012; Light Trap Edward's Funnel leg. Smith, R & Takano, H" // "BMNH(E) 2013-71" [serial number] 54 spec (NHML); "ZAMBIA 1191m Kasanka River Pontoon, Kasanka N.P.; 2-4.xii.2012 S12°34'23''; E30°14'05'' Light Trap Edward's leg. Smith, R & Takano, H" // "BMNH(E) 2013-71" [serial number] 1 spec (NHML); "ZAMBIA 1187m Kabwe Kasanka N.P. S12°32'28''; E30°12'42'' 30.xi. - 1.xii.2012; Light Trap Edward's Funnel leg. Smith, R & Takano, H" // "BMNH(E) 2013-71" [serial number] 1 spec (NHML).

Distribution: Benin, Egypt, South Africa, Sudan, Zambia (ALFIERI (1976), CHARPENTIER (1965, 1968), MASCAGNI (2006), MASCAGNI & MONTE (2000, 2001, 2002, 2003a, 2003b 2005, 2009), SKALICKÝ (2002, 2014)).

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Zusammenfassung

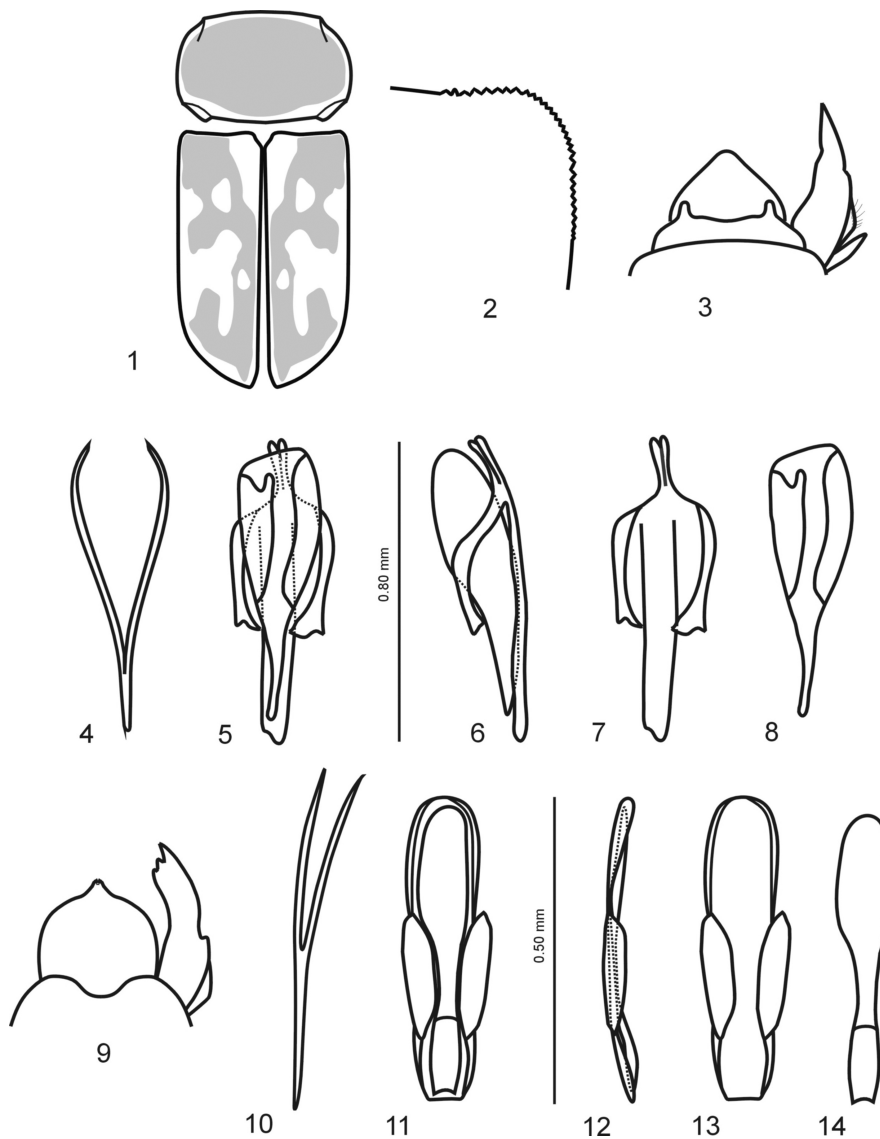
Zwei neue Arten Heteroceridae, *Heterocerus havai* nov.sp. aus Sambia und *Augyles davranogloui* nov.sp. aus Kenia werden beschrieben, illustriert und mit ähnlichen Arten verglichen. Standorte für acht weitere Heteroceridae-Arten aus Kenia und drei Arten aus Sambia sind aufgeführt.

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Figs 1-8: *Heterocerus havai* nov.sp, holotype. (1) pronotum and elytra, dorsal view; (2) dentate of shoulders, lateral view; (3) labrum, right mandible, clypeus, dorsal view; (4) spiculum gastrale, dorsal view; (5) aedeagus, dorsal view; (6) the same, lateral view; (7) parameres and phallobase dorsal view; (8) penis, dorsal view; Figs 1-3 not in scale. **Figs 9-14:** *Augyles davranogloui* nov.sp., holotype. (9) labrum, right mandible, clypeus, dorsal view; (10) spiculum gastrale, dorsal view; (11) aedeagus, dorsal view; (12) the same, lateral view; (13) parameres and phallobase dorsal view; (14) penis, dorsal view; Fig. 9 not in scale.

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