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Medleria gen. nov. adds to the biodiversity of Flatidae (Hemiptera: Fulgoromorpha) in the island of Socotra

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Abstract. A new monotypic genus of flatid planthoppers (Hemiptera: Fulgoromorpha: Flatidae), *Medleria* gen. nov., is described for *Medleria caudata* gen. et sp. nov. (type species) from the island of Socotra (Yemen). Habitus, male and female external and internal genital structures of the new species are illustrated and compared with similar taxa. *Medleria caudata* gen. et sp. nov. is probably endemic to Socotra where it is known to date from a small area of the Dixam mountain plateau only.

Keywords. Afrotropic, Fulgoroidea, systematics, taxonomy, new species.

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Introduction

The island of Socotra is located in the north-western part of the Indian Ocean near the Horn of Africa (Somali peninsula) and the southern shore of the Arabian Peninsula. It covers ca 3600 km^2 and is the largest island of the Socotra Archipelago (part of the Republic of Yemen). Due to its long-term isolation (it is a continental fragment dating back 15 million years ago, at least), diverse geology and geomorphology, and relatively low impact of man, Socotra harbours a diverse flora and fauna including many endemic species (Wranik 2003; Miller & Morris 2004; Razzetti *et al.* 2011; Batelka 2012; Brown & Mies 2012).

Although the first records of planthoppers (Hemiptera: Fulgoromorpha) from Socotra were published more than a hundred years ago, the local fauna of this group of phytophagous (sap-sucking) insects remains largely unknown (Wranik 2003). The few published historical papers on Socotran planthoppers include Kirkaldy (1899, 1903), who described the lophopid *Elasmoscelis iram* Kirkaldy, 1899, later synonymised with a widespread Afrotropical species *E. trimaculata* Walker, 1851 by Distant (1910). Melichar (1902) described three species of Flatidae in *Seliza* Stål, 1862 for which he later established the genus *Mosiona* Melichar, 1923, still known only from Socotra (Melichar 1923; Bourgoin 2017). The remoteness of Socotra and unstable political situation in the Middle East and eastern Africa were obstacles for any detailed faunistic studies in the 20th century and have remained so until the present time. However, recent field work has revealed that Socotra hosts an interesting and possibly highly endemic diversity of planthoppers, particularly in the family Flatidae. So far, four additional genera of Flatidae, viz. *Dixamflata* Stroiński, Malenovský & Świerczewski, 2016, *Haloflata* Świerczewski, Malenovský & Stroiński, 2017, *Kesaflata* Stroiński, Malenovský & Świerczewski, 2016 and *Kirkamflata* Świerczewski, Malenovský & Stroiński, 2014, have been described; all of them are monotypic and have not been recorded outside of Socotra yet (Bourgoin 2017). Some of these recently described species may be threatened by the current environmental changes (Świerczewski *et al.* 2014, 2017; Stroiński *et al.* 2016). This paper aims to describe another new, possibly endemic, flatid species, collected recently in Socotra. We establish a new genus, *Medleria* gen. nov., for it.

Material and methods

The material studied is deposited in the entomological collections of the institutions detailed below.

Label information of all specimens examined is in square brackets and provided verbatim with each line separated by a slash (/).

Institutional abbreviations

MMBC = Moravian Museum, Brno, Czech Republic
NMPC = National Museum, Prague, Czech Republic

Preparation and illustration

The abdomens of the specimens examined were removed and cleared for 30 minutes in a warm solution (50°C) of 10% KOH, with a few drops of chlorazol black (CAS No. 1937–37–7) for dying the ectodermic structures based on the method introduced by Carayon (1969) and Bourgoin (1993). Dissections and cleaning of genital structures were performed in distilled water. Final observations and drawings were done in glycerol using a camera lucida attached to a light microscope. All colour images were taken using a stereo microscope Leica MZ 16 with a digital camera IC 3D; final images were produced using Helicon Focus and Adobe Photoshop software. The SEM photographs of uncoated specimens were taken in the Laboratory of Scanning Microscopy, Museum and Institute of Zoology, Polish Academy of Sciences (Warsaw), using a scanning electron microscope HITACHI S-3400N under low vacuum conditions.

Measurements and abbreviations

Measurements were taken with an ocular micrometer. The following measurements, ratios and their abbreviations were used in this study:

Total length = length of specimen from head apex to tegmina apex (in dorsal view)
A / B = width of vertex at anterior margin / length of vertex at midline
C / E = width of frons at upper margin / length of frons at midline
D / E = maximum width of frons / length of frons at midline

F / B	=	length of pronotum at midline / length of vertex at midline
G / F	=	length of mesonotum / length of pronotum at midline
G / B+F	=	length of mesonotum / cumulative length of vertex and pronotum at midline
G / H	=	length of mesonotum at midline / width of mesonotum between lateral angles
I / J	=	length of tegmen from the base to the sutural angle (end of "tail") / width of tegmen at the widest part

Terminology

The nomenclature of the forewing (tegmen) veins follows the interpretation proposed by Bourgoin *et al.* (2015). Antennal structures are named in accordance with Stroiński *et al.* (2011). The terminology of the genitalia follows Bourgoin (1988) and Bourgoin & Huang (1990) for the male and Bourgoin (1993) for the female. Nomenclature of plants follows Brown & Mies (2012). Alternative names of the type locality are provided by Bezděk *et al.* (2012).

Results

Class Insecta Linnaeus, 1758
Order Hemiptera Linnaeus, 1758
Suborder Fulgoromorpha Evans, 1946
Superfamily Fulgoroidea Latreille, 1810
Family Flatidae Spinola, 1839
Subfamily Flatinae Spinola, 1839

Medleria gen. nov.
urn:lsid:zoobank.org:act:046D8065-578C-42B8-AB5E-E6CF13AE92D3

Type species

Medleria caudata gen. et sp. nov., here designated.

Diagnosis

The new genus differs from similar flatid taxa so far known from Socotra, the Middle East and Africa by the following characters: vertex short and broad, lacking carinae or grooves on its disc (Figs 1E, 2C–E); frons broad, tricarinate with median and lateral carinae basally separated (Figs 1D, 3C–D); mesonotum with double median carina (Figs 2C–D, 3A–B); sutural angle of tegmen produced into a short, apically subacute, finger-like tail covered with tubercles and sensory structures (Figs 2A, 4A–F); male anal tube deeply split dorsally (Figs 5C–D, 6B), with obtuse apical lobe oriented ventrad (Figs 5A–B, 6A); periandrium with single appendage on each side subapically which is strongly curved apicad and ramified into four well-sclerotized, long spine-like processes (Fig. 6D–E).

Etymology

The genus is named to honour Dr. John T. Medler (1914–2006), an outstanding expert in the taxonomy of the world Flatidae. Gender feminine.

Description

Head. Head with compound eyes, in dorsal view, broad, slightly narrower than thorax (Figs 1B, E, 2B–C, E). Vertex transverse, distinctly narrower and shorter at midline than pronotum, with all margins carinate; disc of vertex without carinae (Figs 1E, 2C–F). Frons widest at its basal (lowest) third, with upper margin almost straight; lateral margins arcuate and elevated, in median portion partly flattened, without incisions, in lower part strongly curved to frontoclypeal suture; disc of frons tricarinate, all carinae basally separated; frontoclypeal suture slightly arcuate (Figs 1D, 3C–D). Clypeus smooth,

without carinae (Figs 1D, 3C–D). Rostrum with apical segment shorter than subapical one, apex reaching between hind coxae (Fig. 3F). Compound eyes elongately oval, with very small callus at posterior margin. Lateral ocelli present (Fig. 1C). Antenna inserted very close to medio-ventral margin of eye; scapus small, ring-like, without setae; pedicel shorter than diameter of eye but distinctly longer than scapus, club-like, apical part concave, functional area at the top and on dorsal surface with trichoid sensilla type 1, antennal plate organs present on apical concavity and basally delimiting lateral margins of dorsal functional surface (Fig. 3D–E).

Thorax. Pronotum shorter than mesonotum at midline; anterior margin surpassing the midlength of compound eyes in dorsal view; pronotum disc with depression alongside anterior margin, median gibbosity and lateral impressions; postocular eminences crest-shaped with acute top (Figs 1B, E, 2C–F). Mesonotum with scutellum widely deltoid, wider than long at midline; disc of mesonotum with double median carina medially separated by deep groove; lateral carinae arcuate, reaching posterior margin; scutellum flat with acute, elevated apex (Figs 1E, 2C–D, F).
Tegmen coriaceous, partly convex, longer than wide, with distinct venation apart from apical part, tapering apicad; costal margin strongly arcuate, costal angle widely rounded, sutural angle produced in a form of short tail covered with tubercles and sensory structures, postclaval sutural margin long (Figs 2A–B, 4A–E). Costal area as wide as postcostal cell, with transverse veinlets, terminating at the level of end of clavus; area between veinlets membranous, each with one or two tubercles; postcostal cell with one transverse veinlet in apical part; apical line absent (Figs 2A with labelled longitudinal veins, 4A). Basal cell long and narrow; ScRA+RP leaving basal cell with short common stem; ScRA elevated, passing the top of bulla; RP in basal part obsolete, with first fork before posterior margin; MP forking after Cu fork but before claval veins joint, MP terminals ending in the tail of tegmen; CuA terminals ending at postclaval margin, anterior to tail. Clavus in basal half elevated and covered with tubercles, posterior part concave, without tubercles; A_1 weakly elevated; Pcu and A_1 joined slightly anterior to clavus apex. Whole tegmen covered with scattered tubercles with their concentration in the following parts: transverse veinlets of costal area, bulla between ScP+RA, RP and MP, basal part of clavus – between Pcu and A_1, and A_1 and A_2 (Figs 2A–B, 4A–B). Hindwing well developed.

Legs. Pro- and mesotibia with shallow groove on external side, about as long as pro- and mesofemur, respectively; apical tarsomere of both legs longer than cumulative length of second and basal tarsomeres. Metatibia longer than metafemur, with two lateral spines placed close to each other in distal part and apical row of spines; basitarsomere of metatarsus about as long as cumulative length of second and apical tarsomeres, with apical spines V-lined; second tarsomere with lateral spines and median pad with setae.

Male terminalia. Anal tube, in lateral view, distinctly elongate, basal part narrower than apical part; anus placed anterior to midlength; apical part with obtuse lobe projected ventrad (Figs 5A–B, 6A); in dorsal view, anal tube elongate and narrow; basal part constricted laterally, apical part with deep split dorsally, closed ventrally (Figs 5C–F, 6B). Pygofer, in lateral view, subrectangular, dorsal margin shorter than ventral margin, anterior margin sinuate, posterior margin produced into a lobe forming obtuse angle postero-dorsally (Figs 5A–B, 6A). Genital style longer than wide, widening apicad, bearing long and straight capitulum with subacute apex oriented dorsad (Figs 5A–B, E–F, 6A, C).

Phallic complex. Periandrium elongate, almost straight, as long as aedeagus, apical part narrower than basal part; lateral split distinctly exceeding midlength (Fig. 6D–E). Dorsal part of periandrium, in lateral view, longer than ventral part, widening apicad, with single appendage on each side subapically; appendage strongly curved apicad with four well sclerotized, long spine-like processes; dorsal side apically membranous with three small lobes (Fig. 6D–E). Ventral part of periandrium unilobate, tapering

apicad, with curved apex; ventral side with distinct triangular keel (Fig. 6F). Aedeagus, in lateral view, long and curved, with apical, bulb-like, sclerotized appendages; in ventral view, with deep median split, not exceeding midlength, lateral parts connected with membrane (Fig. 6G–H).

Female terminalia. Pregenital sternite with asymmetrically X-shaped sclerotization; upper arms shorter than lower ones, median portion weakly sclerotized; lateral lobes separated (Figs 7E–F, 8A–B, 9A). Anal tube, in lateral view, covering gonoplac and reaching its posterior margin; basal part wider than apical part (Figs 7C–D, 9C); in dorsal view, elongately oval (Figs 7A–B, 9B). Gonoplac elongate, oriented horizontally, not covering gonapophysis VIII (Figs 8C, E–F, 9E–F); posterior margin with two rows of alternately placed teeth – large internally and small externally; large teeth of both gonoplacs fitting together in a zip-like manner (Fig. 8D). Gonoplac divided by strongly sclerotized strip into two parts – dorsal and ventral; ventral membranous part very narrow, extending from the teeth to base (Fig. 9E). Gonapophysis VIII relatively slender and narrow, curved, laterally flattened (Fig. 9D); median part of dorsal margin and subapical part of ventral margin with a few (3–4) teeth; endogonocoxal process as long as gonapophysis, tapering apicad, with finger-like apex and spiniferous microsculpture on internal side. Gonospiculum as in Fig. 9G–H. Bursa copulatrix with single pouch, kidney-shaped, cells with weakly sclerotized central areas with microsculpture on the surface (Fig. 9I). Spermatheca well developed, ductus receptaculi longer than diverticulum ductus (Fig. 9J).

Diversity and distribution

The genus is described as monotypic for a single species from Socotra Island.

Medleria caudata gen. et sp. nov.
urn:lsid:zoobank.org:act:BF1F8ADE-2703-41DE-B80F-FDE9F50F452C
Figs 1–10

Diagnosis

The only species in the genus; see diagnosis for the genus.

Etymology

From the Latin adjective '*caudatus*' (= tailed, caudate). The specific epithet refers to the prolonged apical part of the tegmen.

Type material examined

Holotype

YEMEN: ♂, [YEMEN, SOCOTRA Island / Dixam Plateau, 850-920m / N 12°31′24″, E 53°58′29″ / 5.ii.2010 / L. Purchart & J. Vybiral leg.], [COLLECTIO / Moravské museum / Brno], dry-mounted, abdomen detached, dissected and stored in glycerol in a glass microvial (MMBC).

Paratypes

YEMEN: 3 ♂♂, 4 ♀♀, all specimens with the same collecting data as for the holotype, all dry-mounted, abdomens of some specimens detached, dissected and stored in glycerol in a glass microvial (MMBC: 2 ♂♂, 3 ♀♀; NMPC: 1 ♂, 1 ♀).

Description

Size. Total length 4.02–4.07 mm.

Coloration. Ochreous, mottled with small dark brown to black markings on upper part of frons, lateral parts of mesonotum and scutellum, median portion of tegmen, tubercles on clavus and bulla,

apical part of tegmen largely dark; abdominal sternites dark brown with yellow margins, legs brownish (Fig. 1A–E).

Head. Vertex: A / B = 3.00–4.29; anterior margin delicately arcuate; lateral margins almost straight and parallel, posterior margin sharp and elevated, almost straight; disc of vertex weakly depressed (Figs 1E,

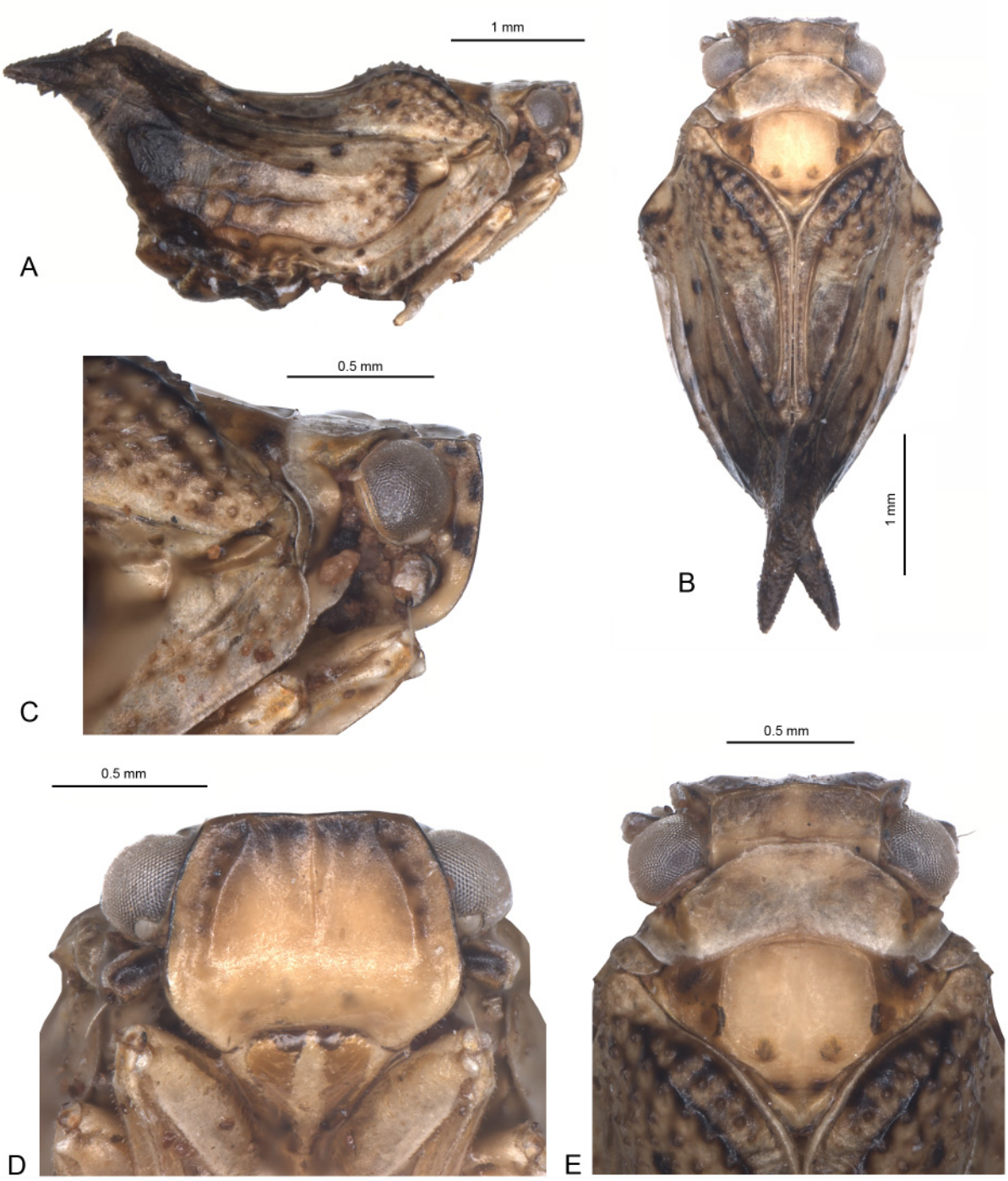

Fig. 1. *Medleria caudata* gen. et sp. nov., paratype, ♂, stereomicroscopic photographs. **A–B**. Habitus. **A**. Lateral view. **B**. Dorsal view. **C–E**. Anterior part of body. **C**. Lateral view. **D**. Frontal view. **E**. Dorsal view.

2D–F). Frons: C / E = 0.83–1.00; D / E = 1.17–1.41; median carina reaching frons middle, lateral carinae distinctly longer than median one; area between bases of median and lateral carinae as well as area between lateral carinae and lateral margins depressed (Figs 1D, 3C–D). Disc of clypeus flattened.

THORAX. Pronotum: F / B = 1.50–2.14; anterior margin medially produced and flattened, posterior margin widely concave (Fig. 2C–E). Mesonotum: G / F = 2.00–2.31; G / B+F = 1.25–1.61; G / H = 0.70–0.75;

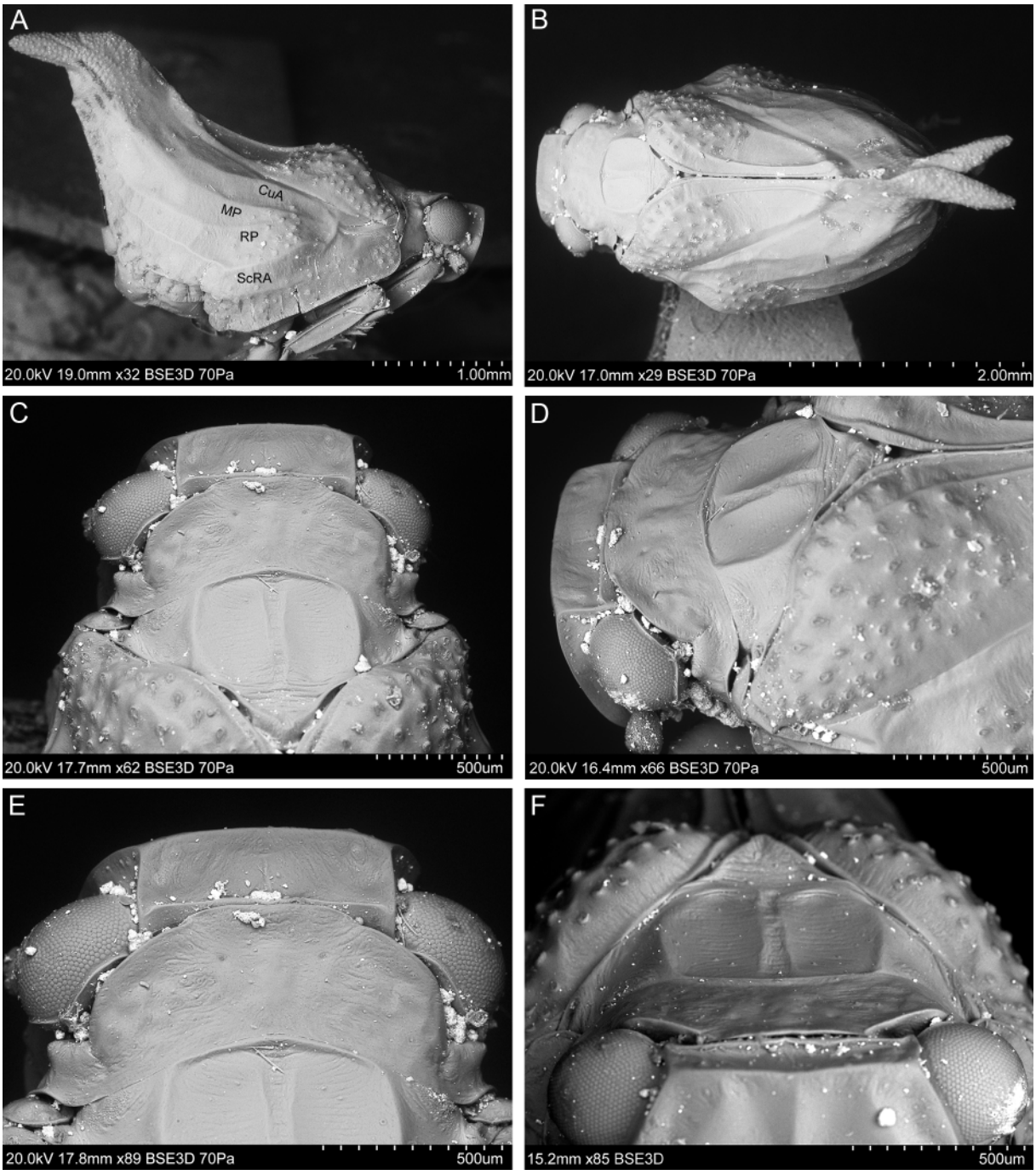

Fig. 2. *Medleria caudata* gen. et sp. nov., paratype, ♂, SEM photographs. **A–B**. Habitus. **A**. Lateral view. **B**. Dorsal view. **C–D**, **F**. Anterior part of body. **C**. Dorsal view. **D**. Dorso-lateral view. **F**. Frontal view. **E**. Head and pronotum, dorsal view.

area between median and lateral carinae depressed (Fig. 2C–F). Tegmen: I / J = 1.59–2.08. Metatibia with apical row of seven well-developed spines, external spines longer than ventral ones; basitarsomere with 7 apical spines; second tarsomere with two lateral spines.

MALE TERMINALIA. Anal tube, in lateral view, with ventral margin weakly convex and dorsal margin weakly concave in median portion, postero-dorsal angle right (Fig. 5A–B). Genital style with posterior margin

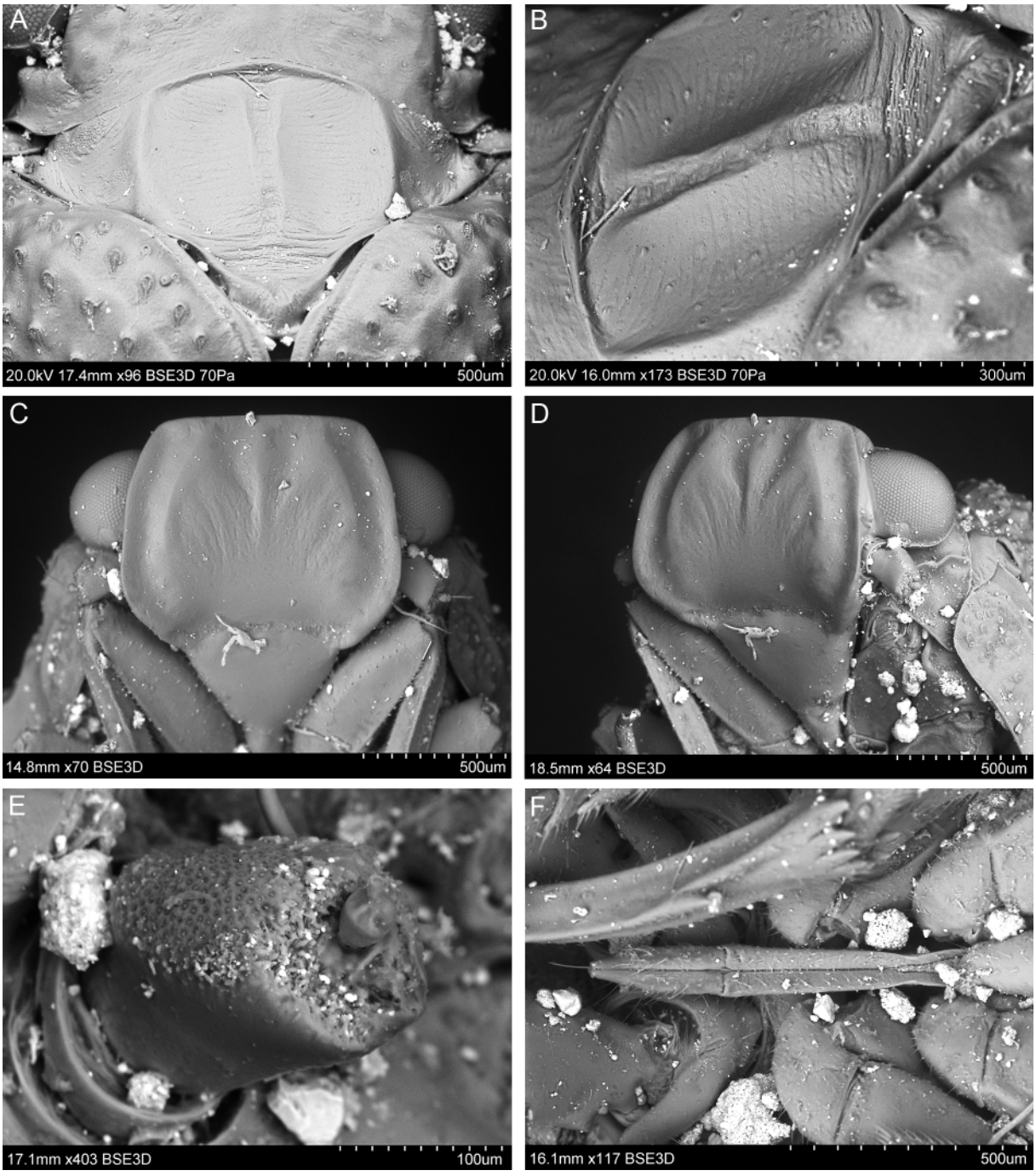

Fig. 3. *Medleria caudata* gen. et sp. nov., paratype, ♂, SEM photographs. **A–B**. Mesonotum. **A**. Dorsal view. **B**. Dorso-lateral view. **C–D**. Frons. **C**. Frontal view. **D**. Fronto-lateral view. **E**. Antenna, dorso-apical view. **F**. Rostrum.

straight, ventral and dorsal margins almost straight, subparallel, postero-ventral angle bluntly rounded, not extending the posterior margin (Fig. 6A–C). Appendage of dorsal periandrium with well-sclerotized small teeth in its median curved part (Fig. 6E). Dorsal part of aedeagus membranous (Fig. 6G).

Female terminalia. Pregenital sternite with posterior margin convex medially, anterior margin concave (Fig. 9A). Anal tube, in lateral view, tapering apicad, with bluntly rounded apex; anus placed

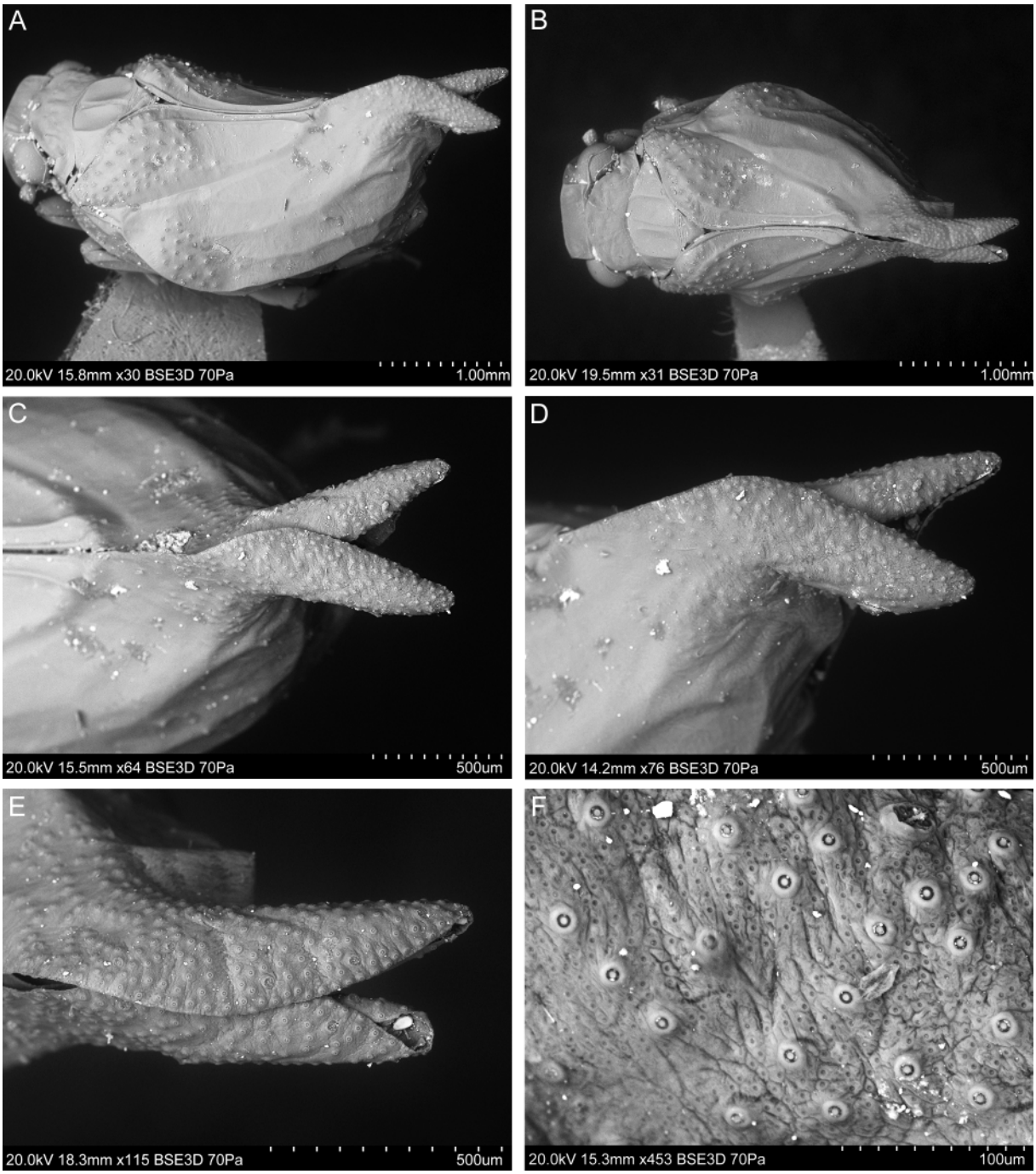

Fig. 4. *Medleria caudata* gen. et sp. nov., paratype, ♂, SEM photographs. **A–B**. Tegmen. **A**. Lateral view. **B**. Dorso-lateral view. **C–E**. Apical part of tegmen ("tail"). **C**. Dorso-lateral view. **D**. Lateral view. **E**. Dorsal view. **F**. Sensory structures.

anterior to midlength; ventral margin medially weakly arcuate (Fig. 9C); in dorsal view, anal tube widest in its median portion, apically truncate, posterior margin almost straight (Fig. 9B). Gonoplac with its dorsal part with membranous base, strongly sclerotized median portion and two rows of teeth placed posteriorly–external teeth small and flat, internal teeth huge and hook-like; ventral part weakly sclerotized (Figs 8D, 9E). Gonapophysis VIII with dorsal margin bearing three teeth, ventral

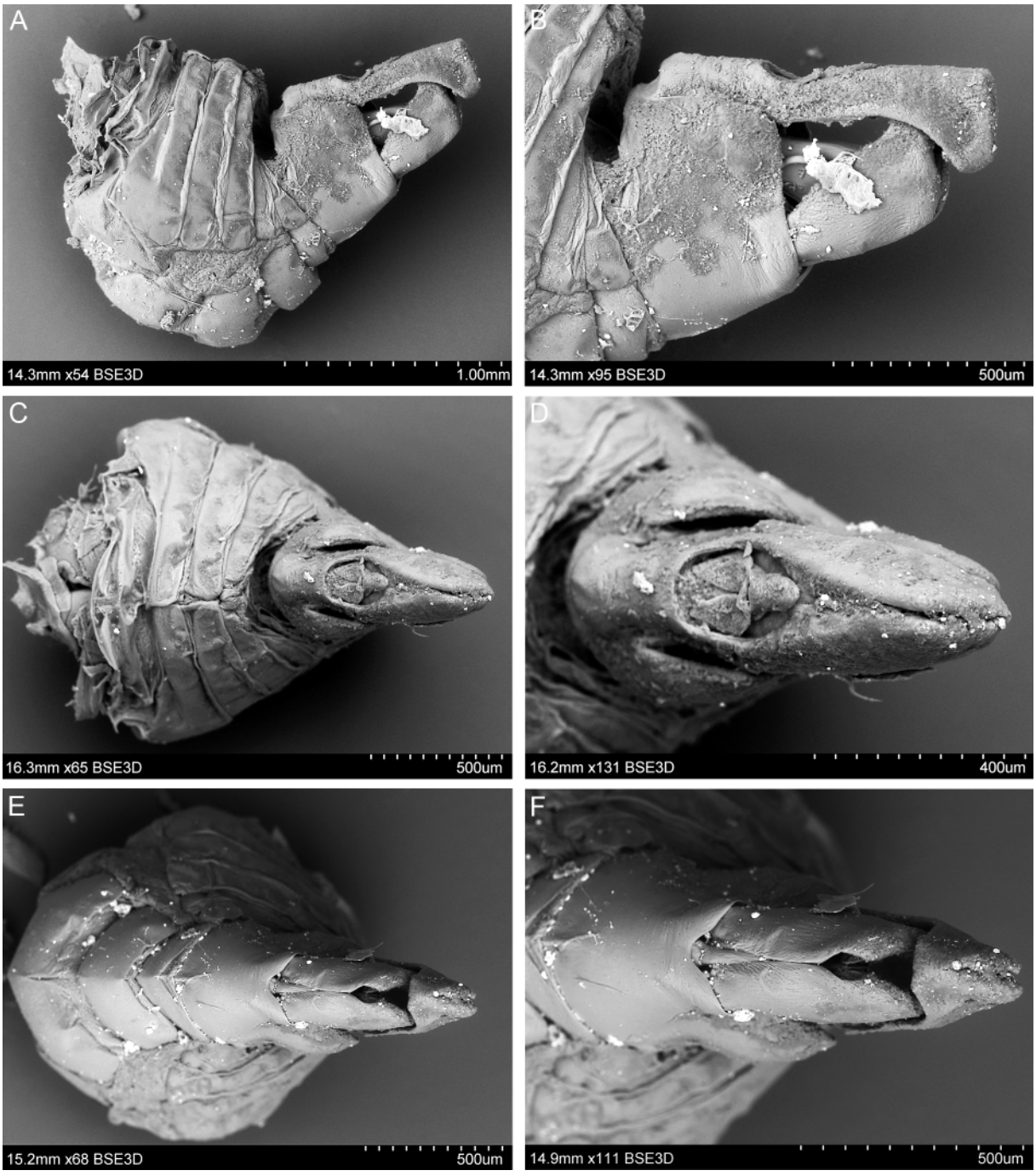

Fig. 5. *Medleria caudata* gen. et sp. nov., holotype, ♂, SEM photographs. **A**, **C**, **E**. Abdomen. **A**. Lateral view. **C**. Dorsal view. **E**. Postero-ventral view. **B**, **F**. Terminalia. **B**. Lateral view. **F**. Postero-ventral view. **D**. Anal tube, dorsal view.

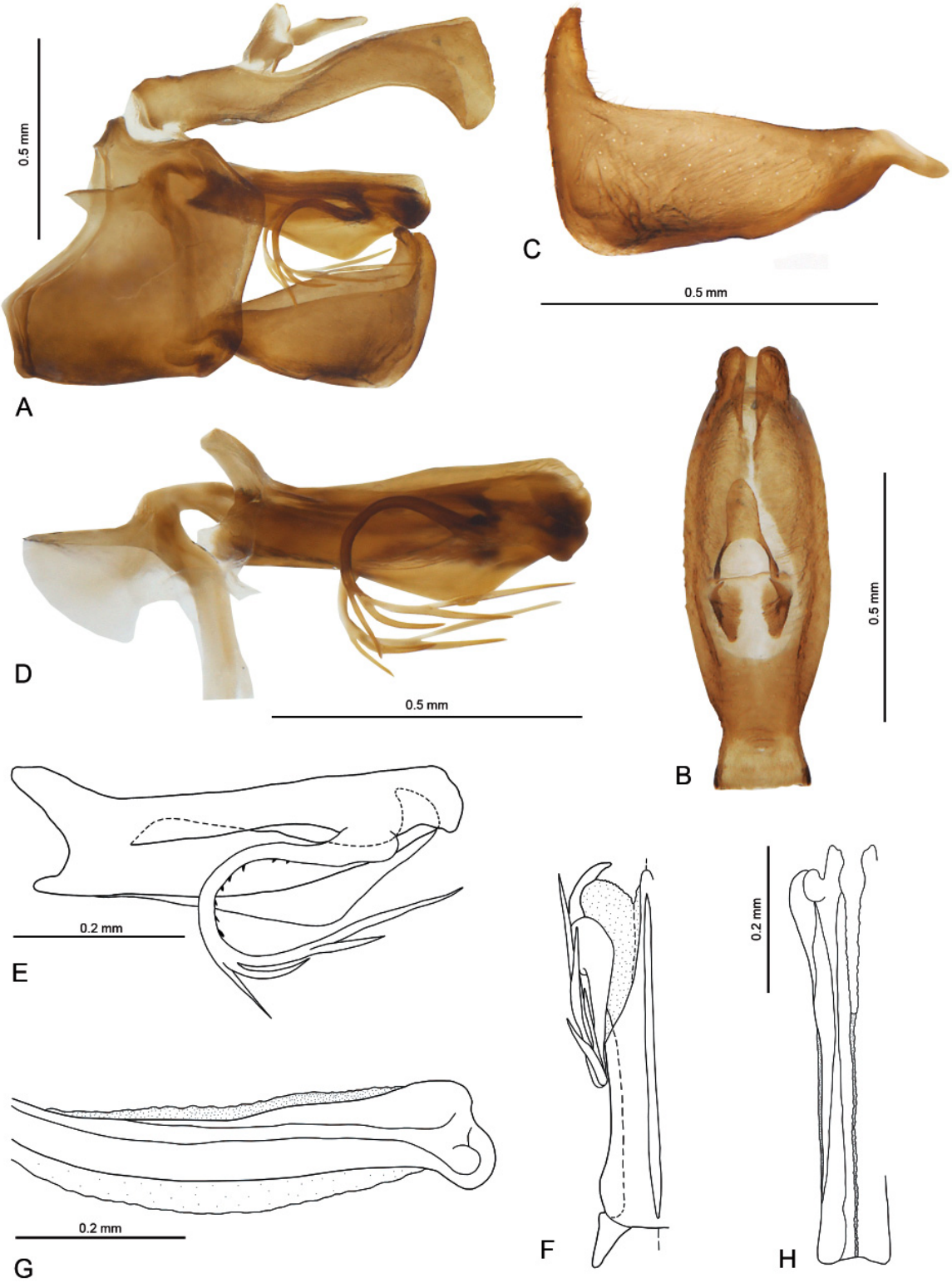

Fig. 6. *Medleria caudata* gen. et sp. nov., holotype, ♂, stereomicroscopic photographs and line drawings. **A**. Terminalia, lateral view. **B**. Anal tube, dorsal view. **C**. Stylus, lateral view. **D**. Periandrium and aedeagus, lateral view. **E–F**. Periandrium. **E**. Lateral view. **F**. Ventral view. **G–H**. Aedeagus. **G**. Lateral view. **H**. Ventral view.

margin subapically slightly up-folded with four teeth; basal part of gonocoxal process with strongly sclerotized strip (Fig. 9D). Spermatheca with ductus receptaculi not divided into two parts, ribbed, widened apically; diverticulum ductus smooth, with narrow basal part and elongate apical bulba (Fig. 9J). Two large eggs (1.2 mm) in ventro-dorsal position were discovered during dissection of the female abdomen.

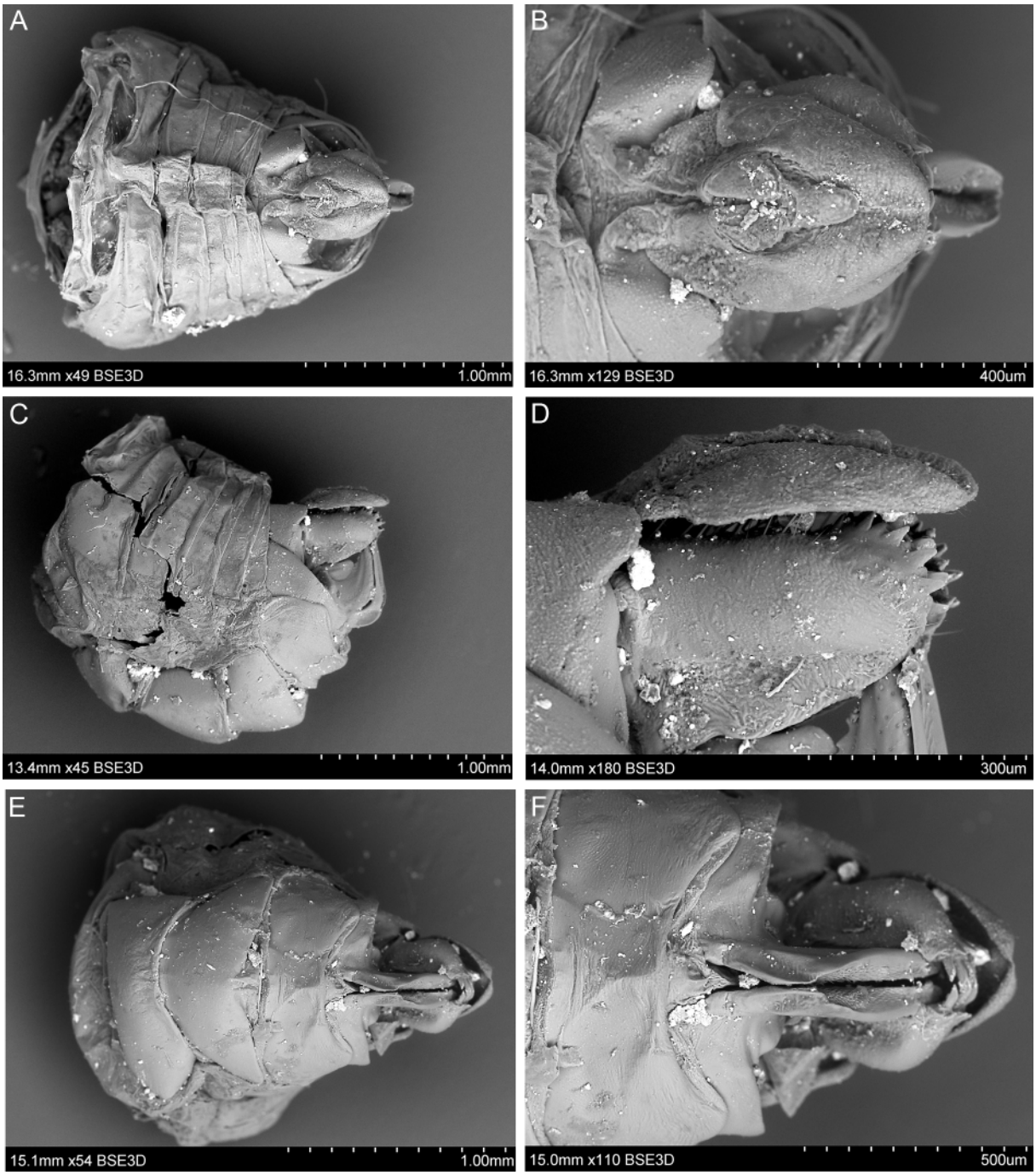

Fig. 7. *Medleria caudata* gen. et sp. nov., paratype, ♀, SEM photographs. **A**, **C**, **E**. Abdomen. **A**. Dorsal view. **C**. Lateral view. **E**. Ventral view. **B**. Anal tube, dorsal view. **D**, **F**. Terminalia. **D**. Lateral view. **F**. Ventral view.

Host plant and habitat

The type series was collected by beating shrubs on a warm and sunny day, in a sparse semi-arid shrubland on a coarse, stony substrate of a montane limestone plateau (Fig. 10A–B). The vegetation was almost uniformly composed of *Croton* cf. *socotranus* Balf. f. (Euphorbiaceae). This plant species is thus a probable host of *M. caudata* gen. et sp. nov. (Fig. 10C).

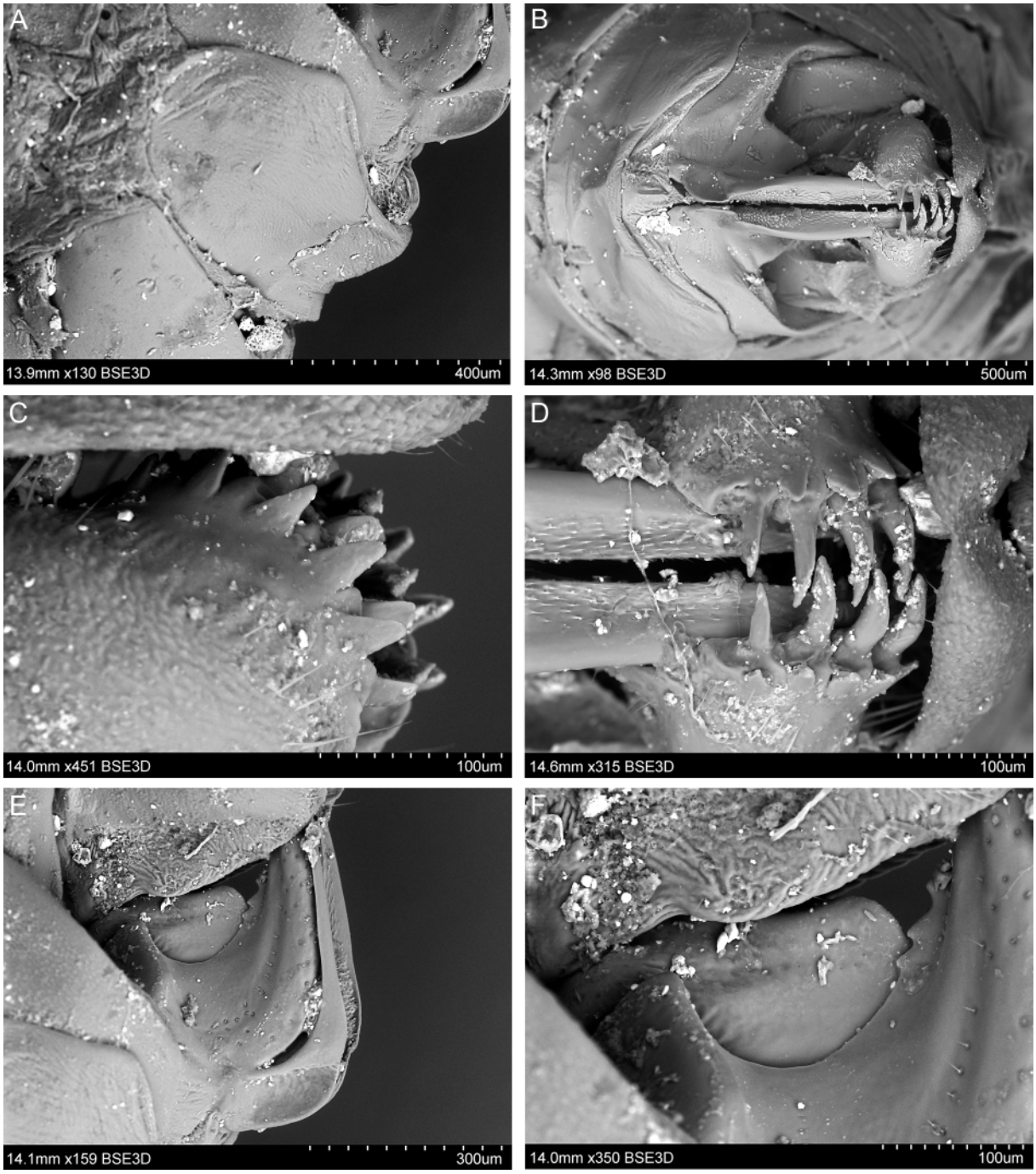

Fig. 8. *Medleria caudata* gen. et sp. nov., paratype, ♀, SEM photographs. **A**. Pregenital sternite, lateral view. **B**. Terminalia, frontal view. **C–D**. Gonoplac teeth. **C**. Lateral view. **D**. Frontal view. **E–F**. Gonapophysis VIII. **E**. Lateral view. **F**. Dorsal margin.

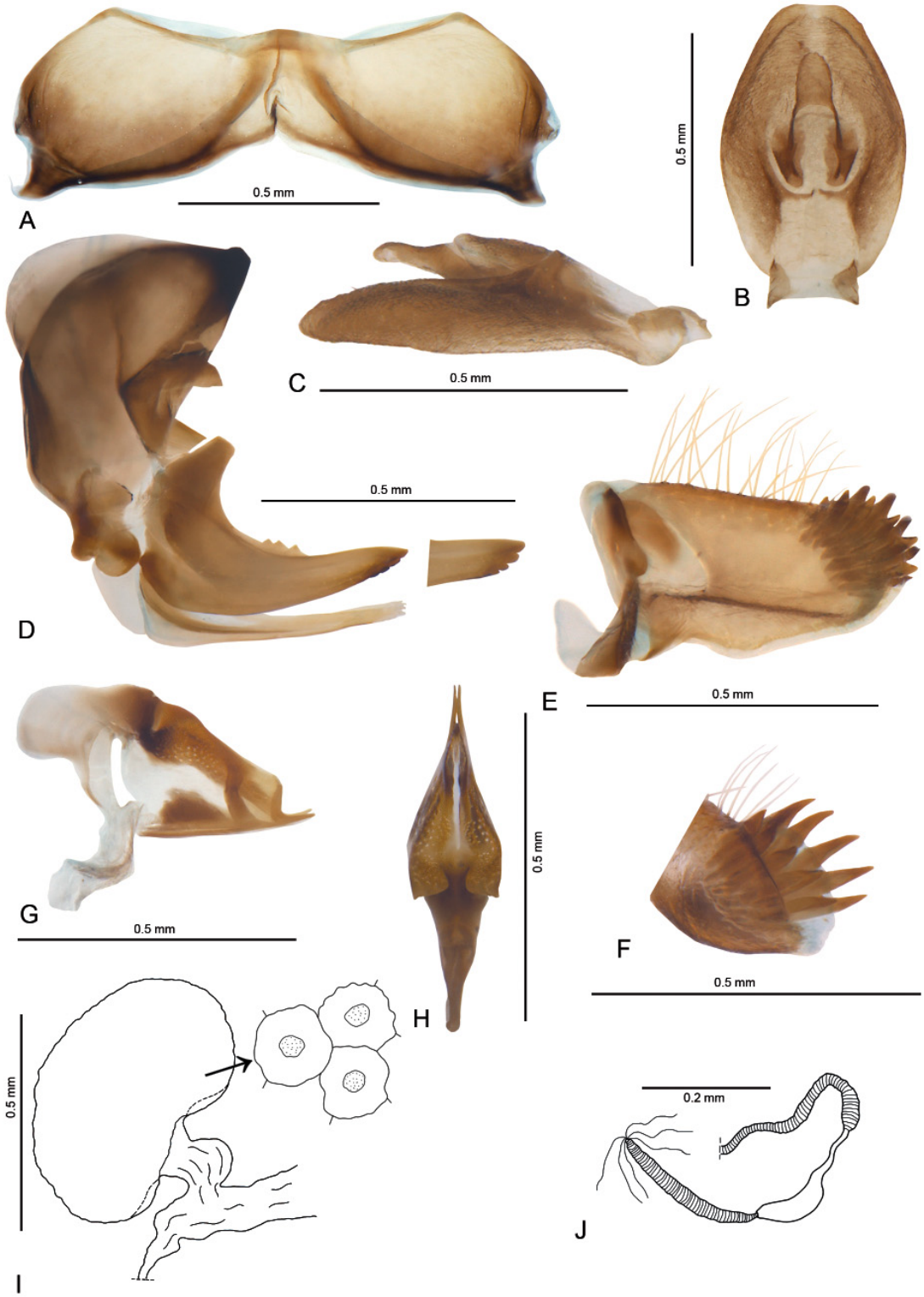

Fig. 9. *Medleria caudata* gen. et sp. nov., paratype, ♀, stereomicroscopic photographs and line drawings. **A**. Pregenital sternite, flattened, ventral view. **B–C**. Anal tube. **B**. Dorsal view. **C**. Lateral view. **D**. Gonapophysis VIII, lateral view. **E–F**. Gonoplac. **E**. Lateral view. **F**. Apical part. **G–H**. Gonapophyses IX and gonospiculum bridge. **G**. Lateral view. **H**. Dorsal view. **I**. Bursa copulatrix with cells, lateral view. **J**. Spermatheca.

Distribution

Yemen: Socotra Island; so far only known from the Dixam montane plateau (12°31′24″ N, 53°58′29″ E) in the central part of the island.

Discussion

There are currently eight described flatid species from Socotra, including *Medleria caudata* gen. et sp. nov. The newly described taxon can be easily distinguished from the seven previously known species by the combination of its body size, shape and coloration, as well as the structure of the head, thorax, tegmen, and male and female terminalia and genitalia. The most similar taxa are two other monotypic genera, *Dixamflata* and *Kesaflata*. *Medleria* gen. nov. shares with them a more or less similar size (*Dixamflata petri* Stroiński, Malenovský & Świerczewski, 2016 is slightly smaller, *Kesaflata lubosi* Stroiński, Malenovský & Świerczewski, 2016 slightly larger than *M. caudata* gen. et sp. nov.), light-brown general coloration with dark markings, strongly bulged bulla and clavus, and coriaceous and relatively short tegmina giving the specimens an issid-like habitus. However, *M. caudata* gen. et sp. nov. differs from both *D. petri* and *K. lubosi* by the following characters:

– a short and broad vertex lacking carinae or grooves on its disc (Figs 1E, 2C–E); *D. petri* has the head anteriorly produced into a conspicuous semicircular crown (Stroiński *et al.* 2016: figs 4, 7, 12–13), *K. lubosi* has a short, but narrow vertex with a median groove (Stroiński *et al.* 2016: figs 57, 62);
– wide frons with three distinct keels widely separated at base (Figs 1D, 3C–D); the frons is relatively narrow with obsolete lateral (= intermediary) keels in *D. petri* (Stroiński *et al.* 2016: figs 6, 16) and relatively narrow with three distinct keels connected at base in *K. lubosi* (Stroiński *et al.* 2016: figs 56, 65);
– mesonotum with a double median carina (Figs 2C–D, 3A–B), in contrast to a single median carina in *D. petri* (Stroiński *et al.* 2016: figs 12–13) and a shallow groove in *K. lubosi* (Stroiński *et al.* 2016: figs 61–63);
– longer tegmen apex (sutural angle) which is upturned, finger-like, subacute and covered with tubercles and sensory structures (Figs 2A, 4A–F); similar sensory structures on the tegmen apex which is, however, less produced are present also in *D. petri* (Stroiński *et al.* 2016: figs 22–23, 25, 27–28); they are absent in *K. lubosi* which has the tegmen apex short and more broadly rounded (Stroiński *et al.* 2016: figs 53, 58–59);
– male anal tube deeply split dorsally (Figs 5C–D, 6B) and with a relatively broad obtuse apical lobe oriented ventrad (Figs 5A–B, 6A); apex of the male anal tube is less deeply split dorsally and, in lateral view, narrow and not produced ventrally in *D. petri* (Stroiński *et al.* 2016: figs 31–35); this character as well as the three following ones are unknown in *K. lubosi* which was described only from a female;
– male pygofer in lateral view produced into an obtusely angled postero-dorsal lobe (Figs 5B, 6A); in *D. petri*, it is nearly regularly arcuate (Stroiński *et al.* 2016: figs 31–32, 35);
– male genital style, in lateral view, with a rounded ventro-apical angle (Fig. 6A, C); in *D. petri*, it bears a small tooth-like ventro-apical process on inner side (Stroiński *et al.* 2016: fig. 35);
– periandrium on each side with a subapical appendage ramified into four spines (Fig. 6D–E), in contrast to a one-armed process in *D. petri* (Stroiński *et al.* 2016: figs 36–37);
– female gonapophysis VIII relatively slender and narrow, with dorsal margin bearing teeth medially but not subapically (Fig. 9D); in *Dixamflata* and *Kesaflata*, it is relatively broader and its dorsal margin bears teeth only subapically (Stroiński *et al.* 2016: figs 48, 73);
– female gonapophyses IX with slender and acute apices (Fig. 9G–H); in both *Dixamflata* and *Kesaflata*, their apices are more robust and blunt (Stroiński *et al.* 2016: figs 49–50).

Another issid-like species recently described from the coastal salt marshes of Socotra, *Haloflata arthrocnemi* Świerczewski, Malenovský & Stroiński, 2017 is smaller in size, with a uniform pale yellowish coloration, broadly rounded tegmen apex, not conspicuously bulged clavus and bulla, and different male and female terminalia (Świerczewski *et al.* 2017). The remaining flatid species in Socotra, *Kirkamflata socotrana* Świerczewski, Malenovský & Stroiński, 2014 and three species of *Mosiona* Melichar, 1923, are significantly larger in size compared to *M. caudata* gen. et sp. nov. and possess large (macropterous) tegmina with unreduced venation (Melichar 1902, 1923; Świerczewski *et al.* 2014).

Within the fauna of a wider region, i.e., Africa and the Middle East, *Medleria* gen. nov. superficially resembles four flatid genera also sharing an issid-like habitus: *Cyphopterum* Melichar, 1905, *Riodeorolix* Lindberg, 1956, *Afrophantia* Fennah, 1958 and partly also *Persepolia* Dlabola & Safavi, 1972. *Medleria* gen. nov. differs from these taxa in having a distinctly tricarinate frons (*Afrophantia*, *Cyphopterum* and *Riodeorolix* have just the median carina present, *Persepolia* has the carinae on frons obsolete), double median carina on mesonotum (single or partly obsolete in all four other genera), and details of the male terminalia, particularly of the pygofer, anal tube and periandrium including its appendages (Lindberg 1953, 1956, 1962, 1963; Fennah 1958; Dlabola & Safavi 1972; Dlabola 1982; Leise & Remane 1994; Medler 2001; Stroiński *et al.* 2016). A detailed morphological redescription of some of these genera and

Fig. 10. Habitat of *Medleria caudata* gen. et sp. nov. at the type locality on Dixam Plateau in central Socotra. **A–B**. Dry shrubland with dominant *Croton* cf. *socotranus*. **C.** Detail of a *Croton* cf. *socotranus* plant (photos by Luboš Purchart).

a phylogenetic analysis including also a representative number of other taxa of Flatidae is needed to test if these superficially similar taxa are also closely related.

Like all other flatid species previously described from Socotra, *M. caudata* gen. et sp. nov. is currently known from this island only. As it is sub-macropterous, its dispersal ability might be reduced. We also suppose that it is trophically associated with the shrub species *Croton* cf. *socotranus* which is endemic to Socotra (Brown & Mies 2012). *Medleria caudata* gen. et sp. nov. may thus represent a species endemic to Socotra as well. Moreover, its distribution on the island may be very restricted – despite a fairly intensive sampling of *C.* cf. *socotranus* at many different localities throughout the island (I. Malenovský, L. Purchart, pers. obs.), *M. caudata* gen. et sp. nov. was recorded only once at a single place on the Dixam montane plateau. The Dixam Plateau and the adjacent Hagher Mountains in central Socotra are well-known for a high concentration of many endemic plants restricted to this part of the island (Miller & Morris 2004; Brown & Mies 2012). Two other presumably endemic flatid species, *Dixamflata petri* and *Kirkamflata socotrana* have also been described from this region (but other habitats and host plants; Świerczewski *et al.* 2014; Stroiński *et al.* 2016). Like these two species, *M. caudata* gen. et sp. nov. may also be imminently threatened by extinction due to habitat degradation, especially by overgrazing and timber harvesting, the intensity of which has been increasing in recent years (van Damme & Banfield 2011; Brown & Mies 2012). Detailed field work is therefore needed in the near future to reveal the distribution of these planthopper species in Socotra more completely, to describe their ecological requirements, and to plan for their efficient conservation.

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