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Revision of the genus *Lophocoryza* Alluaud, 1941 with descriptions of three new species and one new subspecies (Coleoptera: Carabidae: Clivinini)

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Front cover: Holotype of *Lophocoryza sechellensis* Basilewsky, 1973 from Ile Praslin Grande Anse, Seychelles, IV 1972 (Photograph M. Balkenohl).

Revision of the genus *Lophocoryza* Alluaud, 1941 with descriptions of three new species and one new subspecies (Coleoptera: Carabidae: Clivinini)

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Abstract

The genus *Lophocoryza* Alluaud, 1941 is revised for the first time. Redescriptions of the three known species *L. araticeps* Fairmaire, *L. vadoni* Alluaud and *L. sechellensis* Basilewsky are provided. Three new species and one subspecies *L. sciakyi* sp. nov., *L. hanoti* sp. nov., *L. deuvei* sp. nov. and *L. araticeps omanica* ssp. nov. are described. All species are illustrated. A key to the species is proposed. Available ecological data and recordings are summarised.

Keywords: Clivinini, *Lophocoryza*, Madagascar, Seychelles, Djibouti, Oman, revision, taxonomy

Zusammenfassung

Die Gattung *Lophocoryza* Alluaud, 1941 wird zum ersten Mal revidiert. Redescriptionen der drei bekannten Arten *L. araticeps* Fairmaire, *L. vadoni* Alluaud und *L. sechellensis* Basilewsky werden zur Verfügung gestellt. Drei neue Arten und eine Unterart, *L. sciakyi* sp. nov., *L. hanoti* sp. nov., *L. deuvei* sp. nov., und *L. araticeps omanica* ssp. nov. werden beschrieben. Alle Arten werden illustriert. Ein Bestimmungsschlüssel zu den Arten wird vorgeschlagen. Verfügbare ökologische Daten und Fundpunkte werden zusammengefasst.

Introduction

The genus *Lophocoryza* Alluaud, 1941, comprises yellowish to brown small species (2.8–4.9 mm) who exhibit distinct characters among the species. All species possess extraordinary plough-like costae on the frons and the front femur shows a series of transverse carinae on the lower surface.

Members of *Lophocoryza* occur on the coast of Madagascar, the Seychelles, Djibouti and the Sultanate of Oman and are usually found on the beach.

So far, three species have been described. Investigation of determined specimens of *Lophocoryza sechellensis* Basilewsky, 1973, deposited in the Musée Royal de l’Afrique Centrale (Tervuren) revealed that they are not conspecific. In addition, specimens with missing determination labels but sorted under *L. vadoni* Alluaud, 1941, showed non conspecificity. These findings gave reason to prompt me to concentrate in more detail on the genus.

The genus was never treated before as a whole. Consequently, the complete genus is revised in this contribution.

Material and methods

All holotypes and other type material of the described three species were investigated. In addition some other material was localized and it was possible to base this contribution on a total of 68 specimens.

In general, terms, descriptions of characters and methods were based on BALKENOHL (2001). Specimens were examined with stereomicroscopes Leica M205-C and Reichert-Jung Polyvar. Measurements were taken using an ocular micrometer calibrated with an objective micrometer respectively with the integrated and automated measurement system. All specimens investigated were measured. Body length was measured from the apex of the longer mandible in closed position to the apex of the longer elytron. The length of the pronotum was measured along the median line including the flange-like base, and the width was determined at the widest part. The length of the elytron was measured from the anterior basal tip of the reflexed lateral margin to the tip of the apex of the longer elytron. The elytral width was measured at maximum width of both elytra in closed position and represents the general width of the specimen. The limits of the measurements and arithmetic means (\bar{x}) are provided for the values. In case there were three or less specimens available the values are given directly without descriptive statistics.

The genitalia dissected were mounted on transparent celon cards and embedded in polyvinylpyrrolidon. After clearing overnight, these cards were fixed on an object slide and used under the microscope. Descriptions were made from the genitalia with either transmitted or top light (Reichert-Jung Polyvar microscope; used magnification 80-500 times). Dissected specimens are indicated separately under materials as males and females, respectively.

Photographs were taken with a 5-megapixel Jenoptic core 5 digital camera either through the stereomicroscope Leica M205-C using a motorised focussing drive and diffused light with Leica hood LED5000 HDI for the single pictures stacking automatically, or for the Polyvar microscope using the drive manually. All pictures are composites, processed and optimized by using Imagic Client software and enhanced with CorelDRAW Graphics Suite X5.

Complete verbatim label information is given in the description chapters of the new species.

Remarks on the description of some special morphological features of the genus:

The carinae on the frons of the head are described in this contribution as “costa” respectively “costae”. These vertical structures are more highly raised than usual carinae and appear ‘batten’-like (Fig. 5). Similar but shorter and transverse carinae can be observed at the ventral side of the profemur.

In this genus the male aedeagus is small in relationship to body size. However, most strikingly small are the flattened and hyaline-like female coxostyli with stylus one and two fused. They are situated under the apical third of the last visible abdominal sternite, dorso-ventrally.

Acronyms used for the collections are:

- CBB = Coll. Michael Balkenohl, Bonstetten near Zürich, Switzerland;
- CBP = Coll. Petr Bulirsch, Prague, Czech Republic;
- MNHN = Muséum national d’Histoire naturelle, Paris, France;
- MNHP = Museum of Natural History, Pretoria, South Africa;
- RMCA = Musée Royal de l’Afrique Centrale, Tervuren, Belgium.

Taxonomy

Family **Carabidae** Latreille, 1802
Subfamily **Scaritinae** Bonelli, 1810
Tribe **Clivinini** Rafinisque, 1815
Genus ***Lophocoryza*** Alluaud, 1941

Type species: *Coryza araticeps* Fairmaire, 1892, by original designation.

Genus *Lophocoryza* ALLUAUD, 1941: 6.

The Genus *Lophocoryza* is recognizable by the following characters: Small sized (2.8–4.9 mm), yellow or brown species with habitus subcylindrical, head big, labrum seven-setose, clypeus with four anteriorly projecting tubercles, frons with six conspicuously raised longitudinal costae and one transverse costa at neck level. The pleura of the pronotum is slightly swollen with the tumidity more or less visible in dorsal view. On the elytron striae one to four are free at the base, with four or five dorsal setigerous punctures on the third interval, and with elongated scutellar striole at the base of the elytron. Ventrally the profemur has six to nine transverse carinae, the three upper spines of the protibia are elongated, the mesotibial spur is without a subapical seta furnished spur but with four strong setae distally arising from small tubercles. At the margin of the last visible abdominal sternum the two setigerous punctures are widely separated. Distinguished from the most similar genus *Psammocoryza* Hogan, 2006, by the costae which are not only developed at the head as in *Lophocoryza* but also on the pronotum. In addition intervals three, five and seven of the elytron exhibit series of 11 setigerous punctures. *Lophocoryza* is the only genus with four anteriorly projecting tubercles at the clypeus and a transverse costa at neck level.

The species

Lophocoryza araticeps araticeps Fairmaire, 1892
(Figs 1, 9, 16)

Coryza araticeps FAIRMAIRE, 1892: 84;
Coryza araticeps Fairmaire, 1892, ALLUAUD, 1919: 102;
Lophocoryza araticeps Fairmaire, 1892, ALLUAUD, 1941: 6;
Lophocoryza araticeps Fairmaire, 1892, BASILEWSKY, 1973: 202 (a);
Lophocoryza araticeps Fairmaire, 1892, BASILEWSKY, 1973: 248 (b);
Lophocoryza araticeps Fairmaire, 1892, LORENZ, 2005: 148;
Lophocoryza araticeps Fairmaire, 1892, BALKENOHL, 2017: 258.

TYPE MATERIAL. Holotype: ♂, with labels and data: light blue, printed “MUSÉUM PARIS COLL. CH. ALLUAUD” and handwritten in black ink “Obock” / red, printed “TYPE” / beige, handwritten with black ink “Coryza ? araticeps Fairm. Obock” / white, handwritten “Lophocoryza araticeps (Fairm.) Type Coll. Aubert” (MNHN).

Remarks: In FAIRMAIRE (1892) there is no indication given on the number of specimens. According to my knowledge there is no other material available. The three terminal tarsalia are missing on the right hind leg.

DIAGNOSIS. A sturdy looking medium sized species, with maximum width of the elytra behind middle, with pronotum vase-like in dorsal view and lateral margin smooth and convex

throughout its length, and the surface covered with rough but flattened coreaceate-like wrinkles. The transverse costa at the neck is slightly convex, the eyes are somewhat flattened, and the supraantennal plates are straight at middle. The most distinguishing characters from other species in the genus are the dark colour (it is the darkest species of the genus) with the costae on the frons and the head showing the same colour. Moreover the aedeagus is small, of stout shape, and with the tip of apex broadly rounded.

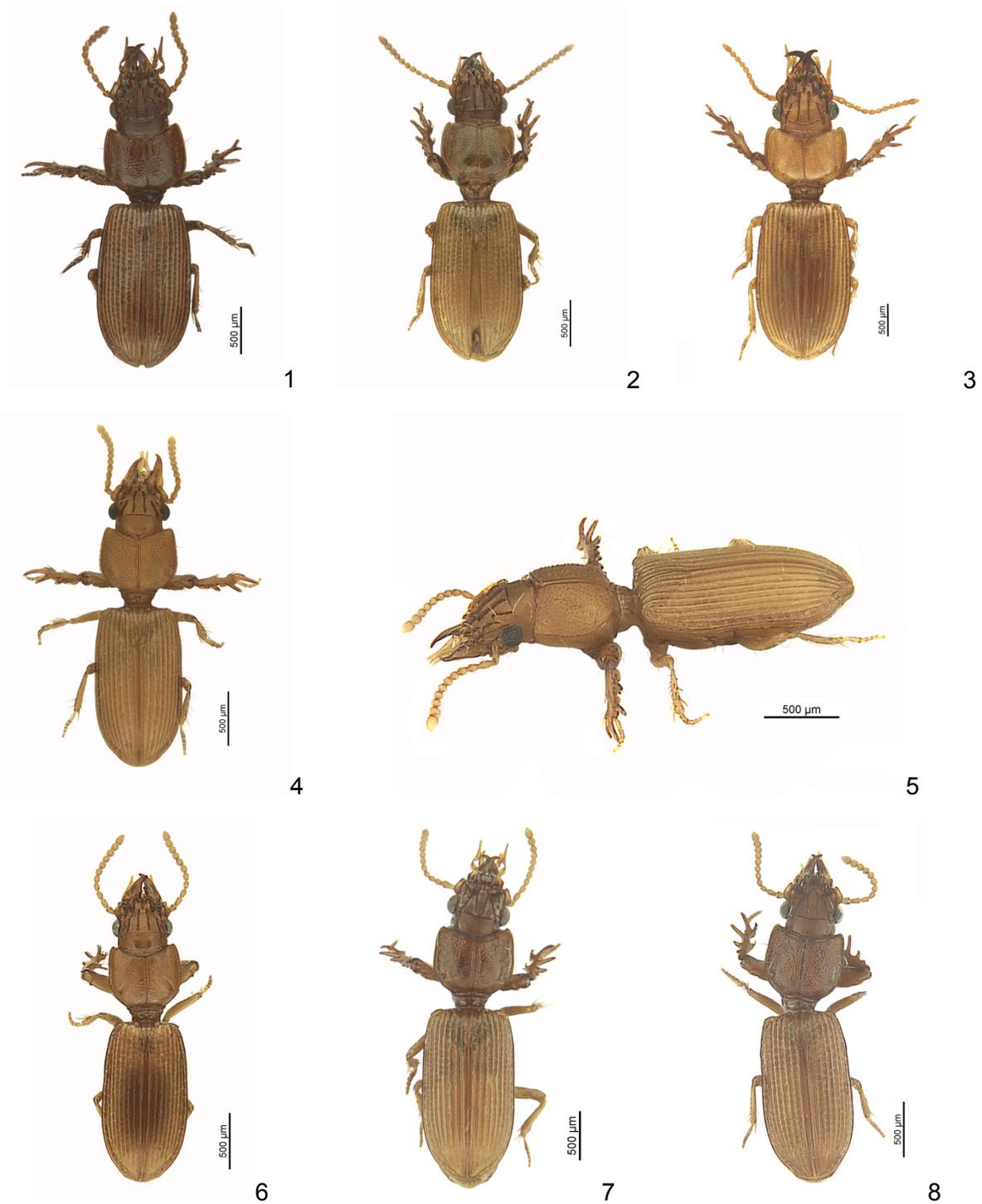
REDESCRIPTION.

Measurements: Body length 3.51 mm, width 0.98 mm, ratio length/width of pronotum 0.77, ratio length/width of elytra 1.8.

Colour: Head opaque, costae on frons of the head glossy, of same colour as head; body and legs shiny. Body and front legs fuscous, elytra leoninus, with indistinct dark line like a triangle at base; antennae testaceous; supraantennal plates translucent flavus; mandible darker apically.

Head: A fifth narrower than pronotum. Clypeus with short longitudinal costa at middle, with two projecting tubercles anteriorly, wings broad, surface smooth, with a projecting tubercle on each wing, as advanced as tubercles of clypeus, separated from clypeus by a costa at each side, tubercles of clypeus and wings somewhat flattened on top; supraantennal plates wide, attenuating anteriorly, margins distinctly reflexed; supraantennal plates with conspicuous costae running from clypeal wing up to posterior-eye level. Frons with six conspicuously raised longitudinal costae, two of them running paramedian in parallel from neck to clypeus, with a second pair of costae running laterally to the central costae from the neck up to the eye midline, distinctly converging anteriorly, with a third shorter pair of costae located laterally at anterior of eye each in parallel to the costae of the supraantennal plates, distinctly interrupted posteriorly. Supraorbital setae located at posterior of eye. Neck composed of a transverse conspicuously raised slightly convex costa, not joined with other costae. Surface of head covered with distinct isodiametric reticulation. Eyes moderately convex, somewhat higher than supraantennal plates. Genae indistinct. Antenna of moderate length, reaching distinctly over lateral tooth of pronotum, segments five to ten longer than wide. Labrum slightly excised anteriorly, with irregular to isodiametric reticulation, seven-setose. Mandible moderately long, straight at middle part, arcuate nearly hook-like at apex, margin reflexed. Apical segment of maxillary palpomere distinctly elongate, securiform, pointed at apex, terminal segment of labial palpomere bottle like, slender apically. Mentum dentate latero-apically, lateral lobes slightly carinate, surface with indistinct reticulation. Medial tooth as prolonged as dents of lateral lobes.

Pronotum (Figs 1, 9): Slightly convex on disc (lateral view). Distinctly convex in frontal view. Outline vase-like, transverse, margins contracted anteriorly, distinctly wider than long. Lateral margin convex, converging anteriorly. Anterior angles rounded off by reflexed lateral margin. Reflexed lateral margin nearly smooth, with six to seven indistinct scar-like notches (100 times), margin running from posterior angle to base as a convex line. Lateral channel wide from anterior angles to posterior angle, separated from disc by a fine carina. Anterior setigerous puncture situated in marginal channel, posterior puncture removed from channel by diameter of pore. Posterior angle marked as small tooth. Pleura not visible in dorsal view. Anterior margin slightly excised. Anterior transverse line wide, not reaching anterior angles, with conspicuous transverse carina between anterior margin and anterior transverse line, distinctly interrupted at middle. Median line wide, valley-like, joining with anterior transverse line and basal constriction, with bilateral carina nearly reaching basal declivity. Basal constriction of moderate size, flange with sharp carina. Disc glossy, covered with rough coreaceate-like wrinkles, with indistinct longitudinal basal impression bilaterally and indistinct paralateral impression parallel to lateral channel.



Figs 1-8. *Lophocoryza* spp., habitus, holotype. 1. *L. araticeps araticeps* Fairmaire, 1892, male. 2. *L. araticeps omanica* ssp. nov., female. 3. *L. vadoni* Alluaud, 1941, male. 4-5. *L. sechellensis* Basilewsky, 1973, male, dorsal (4.) and dorso-lateral (5.) view. 6. *L. sciakyi* sp. nov., male. 7. *L. hanoti* sp. nov., male. 8. *L. deveui* sp. nov., male.

Elytra (Fig. 1): Slightly transversally depressed in anterior third (lateral view). Subelongate, sides moderately convex in anterior two thirds, maximum width behind middle. Base truncated, nearly straight. Marginal channel moderately wide, continuing over rounded humerus up to level of fifth stria without joining striae at base, series of umbilical setigerous punctures not interrupted, punctures of same short distance. Reflexed margin smooth. Humeral tooth distinct. Striole distinct, elongated. Basal tubercle with setigerous puncture distinct, situated at declivity of first stria, tubercle at declivity of interval three distinct. Striae one to four free at base, all striae deep, punctuate-striate. Intervals distinctly convex, carinate apically. Interval three with four setigerous punctures, all approaching stria three. Surface of intervals glossy.

Hind wings: Fully developed.

Ventral description: Pleura slightly swollen postero-laterally, not visible in dorsal view, with transverse wrinkles and indistinct reticulation. Proepisternum and abdomen smooth, shiny. Last five abdominal sternites with two rows of setae. Abdominal sternum with the two marginal setae separated.

Legs: Profemur dorsally covered densely with transverse parallel wrinkles and isodiametric reticulation, ventrally with eight transverse carinae. Protibia with the three upper spines elongated, the basal one shorter and rounded off, surface with longitudinal reticulation, movable apical spur shorter than terminal spine, movable spur not sharp, rounded apically, basal tarsomere as long as tarsomeres two to five together. Mesotibia without preapical spine, with four strong setae distally arising from tubercles.

Male genitalia (Fig. 16): Median lobe of stout shape, small, slightly to moderately arcuate in dorsal view, slightly curved in lateral view, tip of apex broadly rounded. Internal sac with four bunches of bristles. Parameres moderately arcuate, somewhat distorted, each with two long setae arising close together.

Female genitalia: Unknown.

Variation: The surface of intervals shows at one side a few indistinct transverse rugae towards apex.

DISTRIBUTION: Known only from the type locality in Obock, Djibouti.

***Lophocoryza araticeps omanica* ssp. nov.**

(Figs 2, 10, 22)

ETYMOLOGY. The subspecies is named according to the country recorded.

TYPE MATERIAL. Holotype: ♀, with labels and data: white, printed "Oman: Shinass 2443N, 5628E to light 9.VI.94 leg. M.D.Gallagher" / "between mangrove *Avicennia marina* scrub + sea/8602" (CBB).

Remark: The specimen shows slight damage at the reflexed lateral margin of the pronotum just before the tooth of the posterior angle.

DIAGNOSIS. Somewhat more slender than the nominotypical subspecies and distinguished by the pronotum with the basal part of the reflexed lateral margin running from posterior angle to base as a straight line. Moreover the eyes are subglobose in contrast to the convex eyes of the nominotypical subspecies.

DESCRIPTION.

Measurements: Body length 3.35 mm, width 0.94 mm, ratio length/width of pronotum 0.82, ratio length/width of elytra 1.84.

The subspecies differs from the nominotypical subspecies in the following characters:

Colour: Somewhat more pale as the nominotypical subspecies.

Head: Eyes subglobose.

Pronotum (Figs 2, 10): Reflexed lateral margin nearly smooth, with three to four indistinct scar-like notches (100 times), margin running from posterior angle to base as straight line. Bilateral carina at median line running just beyond middle of pronotum. The rough coreacate-like wrinkles on the surface are slightly smoother in basal half as in the nominotypical subspecies.

Elytra (Fig. 2): Lateral margin slightly more parallel as in the nominotypical subspecies.

Male genitalia: Unknown.

Female genitalia (Fig. 22): Coxostyli hyaline, slender, flattened, boomerang-like shaped, with three long nematiform setae, one of them in the middle part and two situated more towards apex, with one minute pilus at tip of apex.

DISTRIBUTION: Known from one record in Shinas located in the North of Oman close to the United Arab Emirates.

REMARK: If the subspecies deserves elevation to species level this should be determined when more material and both sexes are available.

Lophocoryza vadoni Alluaud, 1941
(Figs 3, 11, 17, 23)

Lophocoryza vadoni ALLUAUD, 1941: 6;

Lophocoryza vadoni Alluaud, 1941, JEANNEL, 1946: 227;

Lophocoryza vadoni Alluaud, 1941, BASILEWSKY, 1973: 202 (a);

Lophocoryza vadoni Alluaud, 1941, BASILEWSKY, 1973: 249 (b);

Lophocoryza vadoni Alluaud, 1941, LORENZ, 2005: 148.

TYPE MATERIAL. Holotype: ♂, with labels and data: white, printed “Madagascar R^{on} Maroantsetra Vadon !” and handwritten in black ink “XI.36” / white, handwritten with black ink “Lophocoryza Vadoni n.g. – n.sp. Type Alluaud” / red, printed in bold “TYPE” / light blue, printed “MUSEUM PARIS COLL. CH. ALLUAUD” (MNHN).

Paratypes: Not available.

ADDITIONAL MATERIAL. 1♂, with labels and data: red, printed, black framed: COMP. TYP. BASILEWSKY / white, printed and handwritten COLL. MUS. CONGO Madagascar: Maroantsetra Col. P. Basilewsky / Lophocoryza Vadoni ALL. P. Basilewsky det., 19 / beige, printed, black framed: GENIT. ♂ 71.265.1 / slide with mounted aedeagus available and labelled: COLL. MUS. TERVUREN Lophocoryza vadoni ALL. 71.265.1 ♂ Madagascar Maroantsetra (RMCA); 2♂♂, with labels and data: white, handwritten in black ink: Maroantsetra lumière II.51 Vadon! / white, printed: COLL. MUS. TERVUREN (ex Muséum Paris) Coll. P Basilewsky / beige, printed, black framed: GENIT. ♂ 71.255.9, and second specimen with: GENIT. ♂ 71.255.10 (RMCA/CBB); 1♂, light blue, printed and handwritten: MADAGASCAR MAROANTSETRA J. Vadon 23.II.51 / light blue, handwritten: à la lumière / beige, printed, black framed: GENIT. ♂ 71.255.11 / white, printed: COLL. MUS. TERVUREN (ex Muséum Paris) Coll. P Basilewsky. / slide with mounted aedeagus available and labelled: COLL. MUS. TERVUREN Lophocoryza vadoni ALL. 71.255.11 ♂ Madagascar Maroantsetra (RMCA); 1♂, 2♀, light blue, printed and handwritten: MADAGASCAR MAROANTSETRA J. Vadon 23.II.51 / light blue, handwritten: à la lumière (MNHN/CBB); 2 specimens: Maroantsetra à la lumière II.51 Vadon! / Lophocoryza vadoni ALL. P. Basilewsky det. 1971 and the second one undetermined (MNHN).

Remarks: In two specimens without gender indication the gender could not be determined with certainty. The specimens have an empty hind cavity, obviously resulting from a mounting attempt of a former researcher.

DIAGNOSIS. A sturdy looking big sized species, with maximum width of the elytra behind middle, with pronotum distinctly transverse and shaped in dorsal view like a wider bowel, and lateral margin distinctly crenulated and convex in its whole length, and the surface covered with small coreaceate-like meshes, fine granula and indistinct reticulation. The transverse costa at the neck is distinctly convex, the eyes are distinctly globose, and the lateral margin of the supraantennal plates are distinctly convex. Beside the transverse shape of the pronotum, the most distinguishing characters from the other species are the body size (it is the largest species of the genus) with the costae on the frons and the head showing a different colour. In addition the mentum shows a light emargination only, and the tip of the aedeagus is shaped like half of a spoon with distinctly crenulated margin.

REDESCRIPTION.

Measurements: Body length 4.08–4.91 mm (\bar{x} = 4.51 mm*), width 1.30–1.51 mm (\bar{x} = 1.41 mm*), ratio length/width of pronotum 0.69–0.73 (\bar{x} = 0.71*), ratio length/width of elytra 1.64–1.77 (\bar{x} = 1.69*); (*n = 10).

Colour: Head opaque, costae on frons glossy; pronotum semi-opaque, body and legs shiny. Uniformly ferrugineous with brunneous tinge, slightly darker at base of elytra, in a few specimens with a slightly brownish indistinct and unclear spot at middle of the elytra, lateral margins and front legs darker, costae on frons fuscous, antennae flavus; supraantennal plates translucent flavus, mandible piceous apically.

Head: A fifth narrower than pronotum. Clypeus with short longitudinal costa at middle, with two projecting tubercles anteriorly, wings broad, surface smooth, each with a projecting tubercle on each wing, as advanced as tubercles of clypeus, separated from clypeus by a costa at each side, tubercles of clypeus and wings convex on top; supraantennal plates wide, laterally convex, margins distinctly reflexed; supraantennal plates with conspicuous costae running from clypeal wing slightly beyond mid-eye level. Frons with six conspicuously raised longitudinal costae, two of which run paramedian in parallel from neck to clypeus, with a second pair of costae running laterally to the central costae from the neck distinctly beyond mid-eye level, distinctly converging anteriorly and indistinctly adjoining the central costae, with a third shorter pair of costae located laterally at anterior-eye level each in parallel to the costae of the supraantennal plates, distinctly interrupted posteriorly. Supraorbital setae located at posterior-eye and neck level. Neck composed of a transverse conspicuously raised distinctly convex costa, not joined with other costae. Surface of head covered with distinct isodiametric reticulation. Eyes globose, raised laterally more than 2x as high as supraantennal plates. Genae indistinct. Antenna of moderate length, reaching up to basal constriction of pronotum, segments five to ten distinctly longer than wide. Labrum slightly bilobed and convex anteriorly, with irregular to isodiametric reticulation, seven-setose. Mandible moderately long, straight at middle part, arcuate nearly hook-like at apex, reflexed margined. Apical segment of maxillary palpomere elongate, securiform, pointed at apex, terminal segment of labial palpomere bottle like, slender apically. Mentum quadridentate apically, slightly excised between teeth, lateral lobes with broad carina, surface slightly coreaceate, central tooth obtuse, separated from lateral lobes with slight emargination.

Pronotum (Figs 3, 11): Convex on disc (lateral view). Distinctly convex in frontal view. Outline shaped in dorsal view like a wider bowl, transverse, wider than long. Lateral margin regularly convex. Anterior angles broadly rounded off by reflexed lateral margin. Reflexed lateral margin distinctly crenulated. Lateral channel distinctly wide from anterior angle to

posterior angle, separated from disc by a carina. Anterior setigerous puncture situated in marginal channel, posterior puncture removed from channel by diameter of pore. Posterior angle marked by a small tooth. Pleura somewhat swollen, visible in dorsal view. Anterior margin slightly excised. Anterior transverse line wide, not reaching anterior angle, with conspicuous transverse carina between anterior margin and anterior transverse line, distinctly interrupted at middle. Median line wide, valley-like, joining with anterior transverse line and basal constriction, bilaterally with carina in anterior part. Basal constriction of moderate size, flange with sharp carina. Disc somewhat opaque, with small coreaceous-like meshes, fine granula and reticulation, in few specimens with indistinct paralateral impression parallel to lateral channel.

Elytra (Fig. 3): Slightly transversally depressed in anterior third (lateral view). Subelongate, sides moderately convex, maximum width at middle. Base truncated nearly straight. Marginal channel moderately wide, running over rounded humerus up to level of sixth interval, series of umbilical setigerous punctures not interrupted. Reflexed margin smooth. Humeral tooth small but distinct. Striole distinct, elongated. Basal tubercle with setigerous puncture distinct, situated at declivity of first stria, tubercle at declivity of interval three distinct. Striae one to four free at base, all striae deep, indistinctly punctuate-striate (punctuation nearly invisible). Intervals distinctly convex, carinate apically. Interval three with four setigerous punctures, all approaching stria three. Surface of intervals irregularly reticulated but glossy, with transverse rugae.

Hind wings: Fully developed.

Ventral description: Proepisternum with isodiametric reticulation, pleura somewhat swollen postero-laterally. Prosternum smooth, shiny. Abdomen smooth, shiny, laterally with isodiametric reticulation. Last five abdominal sternites with two rows of setae. Abdominal sternum with the two bigger marginal setae separated.

Legs: Profemur dorsally covered densely with transverse parallel wrinkles and isodiametric reticulation, ventrally with eight transverse carinae. Protibia with the three upper spines elongated, the basal one shorter and rounded off, surface with isodiametric to longitudinal reticulation, movable apical spur shorter than terminal spine, spur and spines not sharp, rounded apically, basal tarsomere nearly as long as tarsomeres two to five together. Mesotibia without preapical spine, with four strong setae distally arising from tubercles.

Male genitalia (Fig. 17): Median lobe moderately slender, in dorsal view moderately arcuate in basal third and towards apex, nearly straight but slightly distorted in lateral view, tip of apex widened, obtusely truncated in dorsal view, rounded spoon like in lateral view, crenulated apically. Orofiscium relatively small. Internal sac with group of bristles, strongly folded apically. Parameres moderately slender, without much distortion, both of them with one long seta at apex, the dorsal one with an additional pilus at apex.

Female genitalia (Fig. 23): Coxostyli slender, hyaline, bottle-like shaped, with three long nematiform setae in the middle part and with one minute pilus at tip of apex.

Variation: The most striking variability was observed in the intensity of coloration and size of the brownish unclear spot at middle of the elytra observed in a few specimens. The reflexed lateral margin of the elytron exhibits in some specimens indistinct blunt scars. The transverse rugae on the intervals of the elytra show some variability in distinctness. Few specimens show a very indistinct paralateral impression parallel to lateral channel of the pronotum.

DISTRIBUTION: Known from Maroantsetra which is located in the North-East of Madagascar. The record “Saint-Augustin, près de Tuléar” and the mark in the map in BASILEWSKY (1973, p. 247 FIG. 107 and text p. 251) refers to another species (*L. hanoti* sp. nov.).



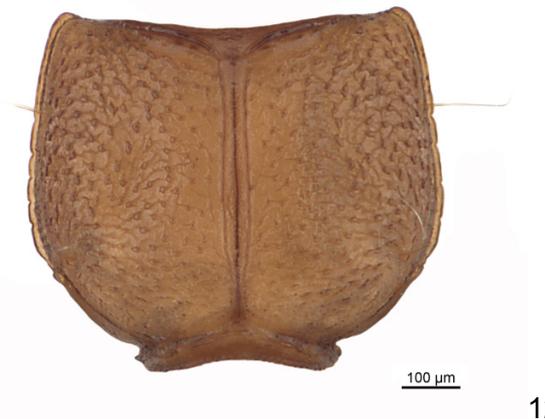
9



10



11



12



13



14



15

Figs 9-15. *Lophocoryza* spp., pronotum, dorsal view. 9. *L. araticeps araticeps* Fairmaire. 10. *L. araticeps omanica* ssp. nov. 11. *L. vadoni* Alluaud. 12. *L. sechellensis* Basilewsky. 13. *L. sciakyi* sp. nov. 14. *hanoti* sp. nov. 15. *L. devei* sp. nov.

***Lophocoryza sechellensis* Basilewsky, 1973**
(Figs 4, 5, 12, 18, 24)

Lophocoryza sechellensis BASILEWSKY, 1973: 202 (a);
Lophocoryza sechellensis, BASILEWSKY, 1973: 249 (b);
Lophocoryza sechellensis Basilewsky, 1973, LORENZ, 2005: 148.
Lophocoryza sechellensis Basilewsky, 1973, BALKENOHL, 2017: 258.

TYPE MATERIAL. Holotype: ♂, with labels and data: white, handwritten “Ile Praslin Grande Anse IV 1972. A. Peyrieras” / grey, printed “MUSEUM PARIS I. SÉCHELLES” / red, printed “HOLOTYPE” / white, handwritten with black ink and printed “Lophocoryza sechellensis n.sp. P. Basilewsky det., 1972” (MNHN).

Paratypes: 3 ♀♀ (one with damaged abdomen), 2 specimens, with labels and data: white, handwritten “Ile Praslin Grande Anse IV 1972. A. Peyrieras” / grey, printed “MUSEUM PARIS I. SÉCHELLES” / red, printed “PARATYPE” / white, handwritten with black ink and printed “Lophocoryza sechellensis n.sp. P. Basilewsky det., 1972” (MNHN/CBB); 4 specimens, with labels and data: white, handwritten “Ile Praslin Grande Anse IV 1972. A. Peyrieras” / grey, printed “MUSEUM PARIS I. SÉCHELLES” / red, printed “PARATYPUS” / white, handwritten with black ink and printed “Lophocoryza sechellensis n.sp. P. Basilewsky det., 1972” / white, printed “COLL. MUS. TERVUREN (ex. Muséum Paris) Coll. P. Basilewsky” (RMCA/CBB).

ADDITIONAL MATERIAL. 1 ♂, Ile Praslin Grande Anse IV 1972. A. Peyrieras / MUSEUM PARIS I. SÉCHELLES (MNHN); 1 specimen, Iles Séchelles Praslin: Grande Anse, à la lumière 1/24. VIII. 1972 / Coll Mus Tervuren Miss. zool. belge aux Séchelles – PLG Benoit et J.J Van Mol / separate label on separate pin, beige, black framed GENIT. ♂; remark: This separately pinned label obviously refers to a preparation slide which could not be located (RMCA); 1 ♂, MADAGASCAR Ouest Soalala (plage) II.1973. A.Peyrieras / COLL. MUS. TERVUREN (ex. Muséum Paris) Coll. P. Basilewsky” (RMCA); 1 specimen, same data but second label Museum Paris (CBB).

DIAGNOSIS. A small sized species, with maximum width of the elytra at middle, with the pronotum vase-like shaped with lateral margin distinctly crenulated. The transverse costa at the neck is straight, the eyes are globose and projecting laterally, and the supraantennal plates are wide and attenuating straight anteriorly. Only the costae on the frons of the head show a darker colour. Distinguished from all other species by the five setigerous punctures on interval three of the elytron, and the disc of the pronotum is covered completely with small upright tubercles.

REDESCRIPTION.

Measurements: Body length 2.77–3.13 mm (\bar{x} = 2.95 mm*), width 0.72–0.88 mm (\bar{x} = 0.82 mm*), ratio length/width of pronotum 0.77–0.84 (\bar{x} = 0.8*), ratio length/width of elytra 1.85–1.92 (\bar{x} = 1.88*); (*n = 15).

Colour: Opaque, flavus, lateral margins and front legs somewhat darker, costae on frons of the head and tip of mandible fuscous, antennae livens; supraantennal plates translucent.

Head: A fifth narrower than pronotum. Clypeus with short longitudinal costa at middle, with two projecting tubercles anteriorly, wings broad, irregularly meshed, each with a projecting tubercle, as advanced as tubercles of clypeus, separated from clypeus by a costa at each side, tubercles of clypeus and wings flattened on top; supraantennal plates wide, attenuating anteriorly, margins distinctly reflexed; supraantennal plates with conspicuous costae running from clypeal wing up to costa of neck constriction. Frons with six

conspicuously raised longitudinal costae, two of them running paramedian in parallel from neck to clypeus, with a second pair of costae running laterally to the central ones from the neck distinctly beyond mid-eye level, distinctly converging anteriorly and indistinctly adjoining the central costae, with a third shorter pair of costae situated laterally at anterior-eye level each in parallel to the costae of the supraantennal plates, distinctly interrupted posteriorly. Supraorbital setae located at posterior-eye and neck level. Neck composed of a transverse conspicuously raised nearly straight costa, at extremities joining with converging costae. Surface of head covered with distinct isodiametric reticulation. Eyes globose, projecting, raised more than 2x as high as supraantennal plates. Genae indistinct. Antenna relatively short, reaching up to basal setigerous puncture of pronotum, segments five to ten slightly longer than wide. Labrum slightly excised anteriorly, with transverse reticulation, seven-setose. Mandible moderately long, straight at middle part, arcuate nearly hook-like at apex, reflexed margined. Apical segment of maxillary palpomere elongate, securiform, pointed at apex, terminal segment of labial palpomere securiform to bottle like, slender apically. Lobes of mentum rounded off apically, laterally reflexed margined, distinctly separated from median tooth by deep notches, median tooth acute, reflexed margined, surface irregularly reticulated.

Pronotum (Figs 4, 5, 12): Convex on disc (lateral view). Distinctly convex in frontal view. Outline in dorsal view like a bowl, wider than long. Lateral margin convex, with straight and converging part in anterior half. Anterior angle rounded off by reflexed lateral margin. Reflexed lateral margin distinctly crenulated. Lateral channel of moderate width from anterior angle to posterior angle. Anterior setigerous puncture situated in marginal channel, posterior puncture removed from channel by diameter of pore (with two anterior setigerous punctures on the right side in the holotype, see under variation). Posterior angle marked by a small tooth. Pleura somewhat swollen, just visible in dorsal view. Anterior margin slightly excised. Anterior transverse line wide, not reaching anterior angle, with conspicuous transverse and convexly raised carina between anterior margin and anterior transverse line, attenuating distinctly to middle, broadly interrupted at middle. Median line wide and valley-like for most of its length, joining with anterior transverse line and basal constriction, bilaterally with carina nearly up to base. Basal constriction of moderate size, flange with sharp carina. Disc covered with small upright tubercles, with fine carinae between the tubercles and irregular reticulation.

Elytra (Figs 4, 5): Slightly transversally depressed in anterior third (lateral view). Elongate, sides straight in anterior half, maximum width at middle. Base truncated nearly straight. Marginal channel moderately wide, running over rounded humerus up to level of fifth stria, series of umbilical setigerous punctures not interrupted. Reflexed margin subcrenulated. Humeral tooth small but distinct. Striole distinct, elongated. Basal tubercle with setigerous puncture distinct, situated at declivity of first stria, tubercle at declivity of interval three distinct. Striae one to four free at base, all striae deep, indistinctly crenulated. Intervals distinctly convex, carinate apically. Interval three with five setigerous punctures, all approaching stria three. Surface of intervals irregularly reticulated but shiny, transverse rugae indistinct.

Hind wings: Fully developed.

Ventral description: Proepisternum and prosternum with irregular reticulation, pleura somewhat swollen postero-laterally. Abdomen with irregular reticulation, first two sternite with indistinct isodiametric reticulation. Last five abdominal sternites with two rows of setae. Abdominal sternum with the two bigger marginal setae separated.



20 21
 Figs 16-21. *Lophocoryza* spp., male genitalia, dorsal view of aedeagus (a) and parameres (b, c), lateral view of aedeagus (d). 16. *L. araticeps araticeps* Fairmaire. 17. *L. vadoni* Alluaud. 18. *L. sechellensis* Basilewsky. 19. *L. sciakyi* sp. nov. 20. *L. hanoti* sp. nov. 21. *L. devei* sp. nov.

Legs: Profemur dorsally covered densely with transverse parallel wrinkles and isodiametric reticulation, ventrally with eight transverse carinae. Protibia with the three upper spines elongated, the basal one shorter and rounded off, surface with longitudinal reticulation, movable apical spur shorter than terminal spine, spur not sharp, spines obliquely truncated apically, basal tarsomere nearly as long as movable spur. Mesotibia without preapical spine, with four strong setae distally arising from tubercles.

Male genitalia (Fig. 18): Median lobe moderately slender, in dorsal view slightly arcuate in basal quarter, slightly distorted in lateral view, tip of apex small, stick-like, turned dorsally (arrow in Fig. 18 d). Orofium elongated. Internal sac with group of bristles. Parameres broad, not much distorted, both of them with two long setae at apex.

Female genitalia (Fig. 24): Coxostyli small, hyaline, slender, flattened, bottle-like shaped, with three long nematiform setae in the middle part and with one minute pilus at tip of apex.

Variation: On the surface of the pronotum the fine carinae between the tubercles are more or less distinctly developed. The lateral margin of the elytra runs parallel in some specimens, in others the margin is slightly diverging, the margin of the elytron is smooth to subcrenulated among the different specimens. Some specimens show a minute tubercle at the declivity of the second interval of the elytron. The holotype exhibits two anterior setigerous punctures on the right side in the marginal channel of the pronotum.

DISTRIBUTION: Known from the Island of Praslin (Seychelles) as well as from Soalala (West of Madagascar).

REMARKS: The record “Oman” (BALKENOHL, 2017) is deleted for *L. sechellensis*. The specimen from Oman represents the new subspecies *L. araticeps omanica* ssp. nov.

***Lophocoryza sciakyi* sp. nov.**

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(Figs 6, 13, 19, 25)

ETYMOLOGY. The species is dedicated to Dr. Riccardo Sciaky, (Milan).

TYPE MATERIAL. Holotype: ♂, with labels and data: white, handwritten “MADAGASCAR Ouest Soalala (plage) II.1973. A.Peyrieras” / light blue, printed “Museum Paris” / white, printed “COLL. MUS. Tervuren (ex Muséum Paris)” (RMCA).

Paratypes: 1 ♀, same data as holotype (MNHN); 1 ♀, white, printed “MADAGASCAR, S.W.: ca. 20 km S. di Tuléar, sulla strada per Saint-Augustin, costa rocciosa 17.V.1991” / white, printed “legit: L. BARTOLOZZI, S.TAITI, C.RAHARIMINA (n.Mag.1107)” (CBB).

DIAGNOSIS. A medium sized species, with maximum width of the elytra at middle, with pronotum square shaped and lateral margin slightly crenulated. The transverse costa at the neck is nearly straight, the eyes are of medium convexity, and the supraantennal plates are distinctly excised. One of the most distinguishing character is the oval dark macula at the middle of the elytra. Distinguished from all other species by the surface of the pronotum which is meshed with flattened isodiametric reticulation. Moreover the aedeagus is stout with the apex stick like and bent dorsally. By contrast to the other species the female coxostylus exhibits two apical pili.

DESCRIPTION.

Measurements: Body length 2.78 / 2.82 / 3.17 mm, width 0.78 / 0.78 / 0.86 mm, ratio length/width of pronotum 0.86 / 0.87 / 0.84, ratio length/width of elytra 1.92 / 1.89 / 1.90.

Colour: Opaque, flavus, lateral margins darker, costae on frons of the head, wings of clypeus, and mandible fuscous, elytra with oval dark macula at middle and indistinct

triangular dark macula at base, antennae pale livens; supraantennal plates and teeth of pronotum translucent.

Head: A fifth narrower than pronotum. Clypeus with short longitudinal costa at middle, with two projecting tubercles anteriorly, wings broad, isodiametrically meshed, with projecting tooth-like tubercle each, slightly more advanced than tubercles of clypeus, separated from clypeus by a costa at each side, tubercles of clypeus convex on top, those of wings somewhat flattened; supraantennal plates moderately wide, attenuating anteriorly, distinctly excised laterally, margins distinctly reflexed margined; supraantennal plates with conspicuous costae running from clypeal wing up to mid-eye level. Frons with six conspicuously raised longitudinal costae, two of them running paramedian from neck to clypeus and slightly diverging posteriorly, with a second pair of costae running laterally to the central costae from the neck almost reaching anterior of eye, distinctly converging anteriorly, with a third shorter pair of costae situated laterally parallel to supraantennal plates each distinctly interrupted posteriorly. Supraorbital setae located at mid-eye and neck level. Neck composed of a transverse nearly straight costa, broadly interrupted from other costae. Surface of head covered with distinct isodiametric reticulation. Eyes convex, laterally projecting somewhat higher as supraantennal plates, oval in lateral view. Genae indistinct. Antenna of moderate length, reaching over basal setigerous puncture of pronotum, segments five to ten distinctly longer than wide. Labrum slightly excised anteriorly, with transverse reticulation, seven-setose. Mandible moderately long, straight at middle part, arcuate at apex, reflexed margined. Apical segment of maxillary palpomere moderately elongated, securiform, pointed at apex, terminal segment of labial palpomere securiform to bottle like, slender apically. Lobes of mentum laterally and centrally with a small sharp tooth, laterally reflexed margined, median tooth acute, surface irregularly reticulated.

Pronotum (Figs 6, 13): Slightly convex on disc (lateral view). Distinctly convex in frontal view. Outline in dorsal view square cup-like, wider than long. Lateral margin convex but with straight parallel part in anterior half. Anterior angle rounded off by reflexed lateral margin. Reflexed lateral margin slightly crenulated. Lateral channel wider at anterior setigerous puncture. Anterior setigerous puncture situated in marginal channel, posterior puncture removed from channel by distance of nearly two diameters of pore. Posterior angle marked by a small tooth. Pleura somewhat swollen but not visible in dorsal view. Anterior margin regularly excised. Anterior transverse line wide, not reaching anterior angle, with transverse and convexly raised carina between anterior margin and anterior transverse line, not interrupted at middle. Median line relatively narrow, joining with anterior transverse line and basal constriction, bilaterally with small carina up to basal inclination. Basal constriction of moderate size, flange with sharp carina. Disc smooth, covered with distinct isodiametric reticulation, with fine transverse wrinkles laterally.

Elytra (Fig. 6): Slightly transversally depressed in anterior third (lateral view). Elongate, sides straight in anterior half, parallel, maximum width at middle. Base truncated, nearly straight. Marginal channel moderately wide, running over rounded humerus up to level of fifth stria, series of umbilical setigerous punctures not interrupted. Reflexed margin smooth. Humeral tooth small but distinct. Striole distinct, elongated. Basal tubercle with setigerous puncture distinct, situated at declivity of first stria, tubercle at declivity of interval three distinct. Striae one to four free at base, all striae deep, indistinctly crenulated. Intervals distinctly convex, carinate apically. Interval three with four setigerous punctures, all approaching stria three. Surface of intervals irregularly reticulated but shiny.

Hind wings: Fully developed.

Ventral description: Proepisternum with irregular reticulation, pleura slightly swollen postero-laterally. Prosternum with irregular reticulation, shiny. Abdomen irregularly reticulated, shiny, laterally with isodiametric reticulation. Last five abdominal sternites with

two rows of setae, with transverse to isodiametric reticulation laterally. Abdominal sternum with the two bigger marginal setae separated.

Legs: Profemur dorsally covered with transverse rugae and indistinct irregular reticulation, with six indistinct transverse carinae ventrally. Protibia with the three upper spines elongated, the basal one short, rounded off, surface with irregular reticulation, movable apical spur shorter than terminal spine, spur somewhat sharpened, spines obliquely truncated apically, basal tarsomere nearly as long as movable spur. Mesotibia without preapical spine, with four strong and one small setae distally arising from tubercles.

Male genitalia (Fig. 19): Median lobe stout, moderately arcuate in dorsal view, slightly more curved towards apex, slightly distorted in lateral view at apex, tip of apex stick-like rounded (arrow in Fig. 19 d). Orofucium of moderate size. Internal sac at middle with group of four small teeth, strongly folded apically. Parameres slender, hardly distorted, each with two setae of moderate length at apex.

Female genitalia (Fig. 25): Coxostyli hyaline, slender, flattened, distorted, bottle-like shaped in dorsal view, with three long nematiform setae, two in the middle part and one located more basally, with two minute pili at tip of apex

Variation: The transverse costa at the neck constriction is slightly convex in one of the paratypes. On the disc of the pronotum the isodiametric reticulation is not completely reaching the median line but leaving a shiny space between the disc and the median line. In the holotype, the transverse and convexly raised carina between the anterior margin and anterior transverse line of the pronotum exhibits an indistinct interruption at middle.

DISTRIBUTION: Recorded from the beach of Soalala (North West of Madagascar) and from the rocky coast of Tuléar near Saint-Augustin (South West of Madagascar).

***Lophocoryza hanoti* sp. nov.**

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(Figs 7, 14, 20, 26)

ETYMOLOGY. The species is dedicated to Stéphane Hanot (Collection Manager, RMCA) who focussed my interest on this exciting genus.

TYPE MATERIAL. Holotype: ♂, with labels and data “MADAGASCAR : TAM Foulpointe ii.1994, plage lumière A.PAULY col” / white, printed “Coll. Mus. Tervuren” (RMCA).

Paratypes: 4♂, same data as holotype (RMCA/CBB); 1♂, immature, with labels and data white, printed “Tuléar St. Augustin III-56 A.R” / pale grey, printed “INSTITUT SCIENTIFIQUE MADAGASCAR” (MNHN); 1♀, white, printed “MADAGASKAR Tollara o. Saint Augustin env. 13.-18.2.1995 Ivo Jeniš leg.” (CBP); 1♂, white, printed “COLL. MUS. TERVUREN Madagascar: Maroantsetra I.1962 J. Vadon” / “beige, printed and handwritten, black framed “Genit. ♂ 71.265.2” / separate slide with labels: white, printed and handwritten “COLL. MUS. TERVUREN Lophocoryza vadoni All. ♂ 71.265.2” / “COLL. MUS. TERVUREN Madagascar: Maroantsetra euparal”. The euparal preparation is completely broken in many fragments and there is no object embedded (RMCA); 1♀, same data as before but without separate genital preparation (CBB); 1 specimen, white, printed “COLL. MUS. TERVUREN Madagascar: Maroantsetra I.1962 J. Vadon” / white, handwritten “sexe”? - four tarsalia of right hind leg and one front leg missing, last abdominal sternite and content of hind body missing (RMCA); 1♂, white, handwritten “Maroantsetra (lumière) J. Vadon.” / grey blue, printed “INSTITUT SCIENTIFIQUE MADAGASCAR”; - damaged specimen (MNHN); 1♂, grey blue, printed and handwritten “MADAGASCAR MAROANTSETRA J.Vadon 23.II.1952” / grey blue, handwritten “à la lumière” - damaged specimen (CBB); 1♂, 1♀, 22 specimens, white, printed “S.Afr:E Cape Nahoon estuary 32.59 S – 27.57 E” / white, printed “ 23.11.1992 leg.M.Burse” (MNHP/CBB).

Remark: In the holotype the tarsalia of the right middle leg are missing.

DIAGNOSIS. A medium sized species, with maximum width of the elytra at middle, with pronotum in dorsal view cup-like shaped and lateral margin nearly straight. The transverse costa at the neck is almost straight and slightly adjoining the other costae. The lateral margins of the supraantennal plates are straight. The surface of the pronotum is covered evenly with rough coreaceous-like sculptures. In this species the subglobose eyes are as high as the supraorbital plates. More distinguishing characters to the other species within the genus are the lateral margin of the pronotum which exhibits a straight part directly anterior to midpoint but is contracted to the anterior angles in anterior quarter. Moreover the aedeagus is slender in dorsal view and nearly right-angled arcuate at middle, the apical part is elongated with the tip of apex turned dorsally in lateral view.

DESCRIPTION.

Measurements: Body length 3.15–3.61 mm (\bar{x} = 3.31 mm*), width 0.91–1.02 mm (\bar{x} = 0.96 mm*), ratio length/width of pronotum 0.79–0.84 (\bar{x} = 0.81*), ratio length/width of elytra 1.73–1.94 (\bar{x} = 1.88*); (*n = 12).

Colour: Head opaque, costae on frons of the head glossy; pronotum glossy, body and legs shiny. Elytra, middle and hind legs testaceous. Elytra with triangular dark macula at base. Pronotum and front legs darker. Lateral margins of pronotum somewhat translucent, costae on frons and mandible fuscous, antennae flavus.

Head: A fifth narrower than pronotum. Clypeus with short longitudinal costa at middle, with two projecting tubercles anteriorly, wings broad, its surface isodiametric reticulated, with a projecting tubercle each, nearly as advanced as tubercles of clypeus, separated from clypeus by a costa at each side, tubercles of clypeus convex on top, those of wings flattened on top; supraantennal plates wide, laterally straight, margins distinctly reflexed margined; supraantennal plates with conspicuous costae running from clypeal wings nearly to posterior eye level. Frons with six conspicuously raised longitudinal costae, two of them running paramedian in parallel from neck to clypeus, slightly diverging posteriorly, with a second pair of costae running laterally to the central ones from the neck to anterior eye level, distinctly converging anteriorly, not adjoining the central costae, with a third shorter pair of costae located laterally at anterior-eye level each in parallel to the costae of the supraantennal plates, interrupted posteriorly. Supraorbital setae located at mid-eye and posterior-eye level. Neck composed of a transverse conspicuously raised straight costa, slightly adjoining other costae. Surface of head covered with distinct isodiametric reticulation, fields of meshes distinctly convex. Eyes subglobose, as high as supraantennal plates. Genae indistinct. Antenna subelongate, reaching nearly up to basal constriction of pronotum, segments five to ten distinctly longer than wide. Labrum slightly excised, with transverse reticulation, seven-setose. Mandible moderately long, straight at middle part, arcuate nearly hook-like at apex, reflexed margined. Apical segment of maxillary palpomere elongate, securiform, pointed at apex, terminal segment of labial palpomere bottle like, slender apically. Mentum with lateral lobes bidentate, surface with longitudinal rugae, tooth between lobes at same level as dents of lateral lobes.

Pronotum (Figs 7, 14): Planate to slightly convex on anterior half of disc (lateral view). Distinctly convex in frontal view. Outline square, in lateral view cup-like, wider than long. Lateral margin straight in anterior half, slightly converging. Anterior angle moderately rounded off by reflexed lateral margin. Reflexed lateral margin almost smooth (slight undulation at 120 times). Lateral channel moderately narrow, as wide as two times the width of reflexed lateral margin. Anterior setigerous puncture situated in marginal channel, posterior puncture removed from channel by diameter of pore. Posterior angle marked by a small tooth.

Pleura just visible in dorsal view. Anterior margin slightly excised. Anterior transverse line wide, not reaching anterior angles, with conspicuous transverse carina between anterior margin and anterior transverse line, distinctly interrupted at middle. Median line wide, valley-like, joining with anterior transverse line and basal constriction, bilaterally with carina in most of length. Basal constriction of moderate size, flange with sharp carina. Disc shiny, with smaller coreaceous-like meshes, lines of meshes often transverse (variable), fields between meshes convex.

Elytra (Fig. 7): Slightly transversally depressed in anterior third (lateral view). Elongate, sides straight at middle, maximum width at middle. Base truncated, nearly straight. Marginal channel moderately wide, running over rounded humerus up to level of fifth stria, series of umbilical setigerous punctures not interrupted. Reflexed margin smooth. Humeral tooth distinct. Striole distinct, elongated. Basal tubercle with setigerous puncture distinct, situated at declivity of first stria, tubercle at declivity of interval three distinct. Striae one to four free at base, all striae deep, indistinctly punctuate-striate. Intervals distinctly convex, carinate apically. Interval three with four setigerous punctures, all approaching stria three. Surface of intervals glossy, with minute transverse rugae, striae irregularly reticulated.

Hind wings: Fully developed.

Ventral description: Proepisternum with transverse wrinkles, pleura somewhat swollen postero-laterally. Prosternum smooth, glossy. Abdomen smooth, shiny, laterally with isodiametric reticulation. Last five abdominal sternites with two rows of setae. Abdominal sternum with the two bigger marginal setae separated.

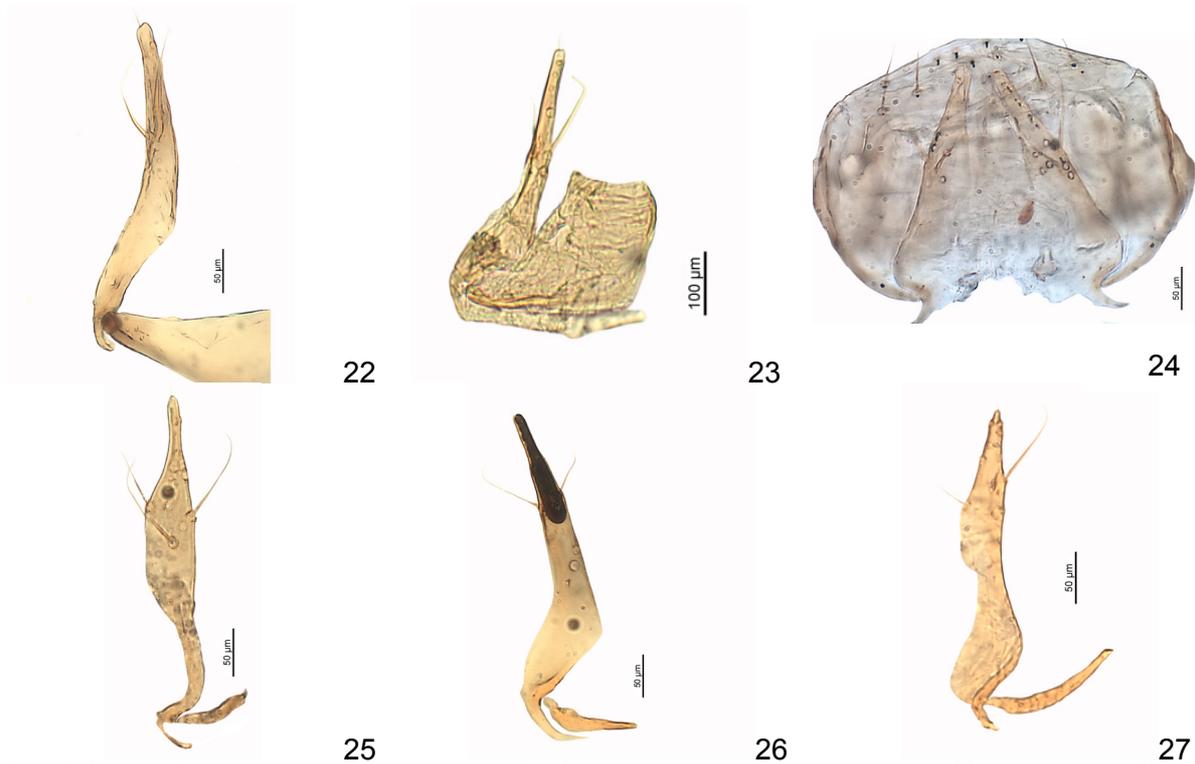
Legs: Profemur dorsally covered densely with transverse parallel wrinkles and irregular reticulation, ventrally with nine transverse carinae. Protibia with the three upper spines elongated, the basal one shorter and rounded off, surface with longitudinal reticulation, movable apical spur distinctly shorter than terminal spine, spur and spines rounded apically, basal tarsomere nearly as long as tarsomeres two to five together. Mesotibia without preapical spine, with four strong setae distally arising from tubercles.

Male genitalia (Fig. 20): Median lobe slender, elongated, in dorsal view nearly right-angled arcuate at middle, apical part elongated, tip of apex turned dorsally (arrow in Fig. 20). Oroficium of moderate size. Internal sac with few teeth and a bunch of bristles. Parameres medium sized, hardly distorted, the dorsal one stepped at apex, both of them with two distinctly separated long setae at apex.

Female genitalia (Fig. 26): Coxostyli hyaline, slender, flattened, boomerang-shaped, with three long nematiform setae in the middle part and with one minute pilus at tip of apex.

Variation: The triangular dark macula at base of the elytra is in a few specimens not sharply marked. The lateral margin of the pronotum shows in some specimens a slight contraction at level of the anterior setigerous puncture. Some specimens from Maroantsetra exhibit slightly more convex eyes and the aedeagi are slightly more slender in the apical half as in the other populations. Moreover the wrinkles in the coreaceous pattern on the pronotum seems to be more equalized.

DISTRIBUTION: Found in Madagascar at the beach at the following localities: Maroantsetra and Foulpointe (both localities located in the North east of Madagascar) and Toliara (Tuléar) near Saint Augustin (South West of Madagascar).



Figs 22-27. *Lophocoryza* spp., female coxostyli. 22. *L. araticeps omanica* ssp. nov. 23. *L. vadoni* Alluaud. 24. *L. sechellensis* Basilewsky. 25. *L. sciakyi* sp. nov. 26. *L. hanoti* sp. nov. 27. *L. deuvei* sp. nov.

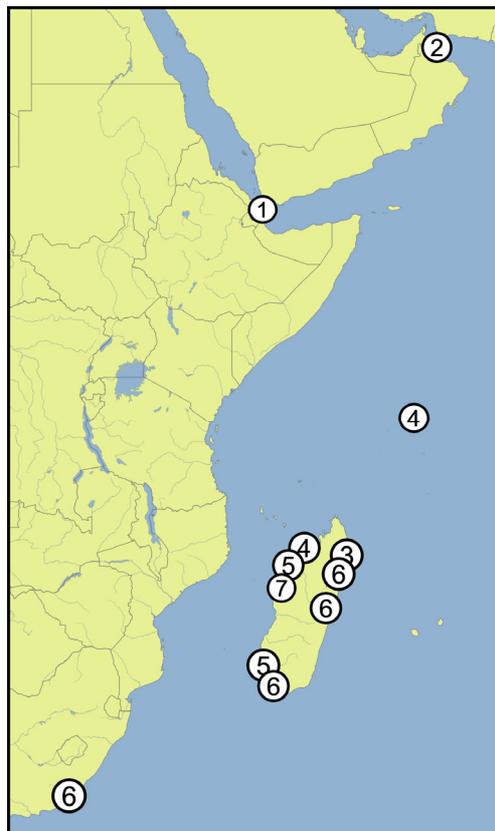


Fig. 28. Distribution of the species of the genus *Lophocoryza* in East Africa and the Arabia Peninsula. 1. *L. araticeps araticeps* Fairmaire. 2. *L. araticeps omanica* ssp. nov. 3. *L. vadoni* Alluaud. 4. *L. sechellensis* Basilewsky. 5. *L. sciakyi* sp. nov. 6. *L. hanoti* sp. nov. 7. *L. deuvei* sp. nov.

***Lophocoryza deuvei* sp. nov.**

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(Figs 8, 15, 21, 27)

ETYMOLOGY. The species is dedicated to Dr. Thierry Deuve (MNHN) who supported this contribution considerably.

TYPE MATERIAL. Holotype: ♂, with labels and data: white, handwritten “MADAGASCAR Ouest Soalala (plage) II.1973. A. Peyrieras” / “white, printed “Museum Paris” / white, handwritten and printed “*Lophocoryza sechellensis* Basilew. P. Basilewsky det. 1973” (MNHN)

Paratype: 1♀, with labels and data: white, handwritten “MADAGASCAR Ouest Soalala (plage) II. 1973. A. Peyrieras” / white, printed COLL. MUS. TERVUREN (ex. Museum Paris) Coll. P. Basilewsky” (RMCA).

Remark: In the holotype the apical part of the right middle tibia and the tarsalia are missing as well as the terminal tarsus of the right hind leg.

DIAGNOSIS. A medium sized species, with elongated elytra having the maximum width at middle. The transverse costa at the neck is slightly convex and adjoining the other costae. The lateral margins of the supraantennal plates are nearly straight. The surface of the pronotum is covered with small but deep wrinkles of a coreaceous-like structure, the fields between the wrinkles are distinctly convex. The eyes are subglobose and not as high as the supraantennal plates. Distinguished from the other species by the square pronotum with straight but slightly converging and subcrenulated lateral margin which is contracted to the anterior angles only at the tip. Moreover the aedeagus is slender and elongated, is in dorsal view distinctly but obtusely angled arcuate at middle, the apical part is elongated, and the tip of the apex is shaped like half of a spoon with smooth margin. The dorsal paramere exhibits three long setae at apex.

DESCRIPTION.

Measurements: Body length 3.00 / 3.01 mm, width 0.81 / 0.82 mm, ratio length/width of pronotum 0.88 / 0.88, ratio length/width of elytra 1.95 / 1.96.

Colour: Head opaque, costae on frons glossy; pronotum, body and legs shiny. Elytra, middle and hind legs testaceous. Elytra with dark indistinct triangular macula at base. Pronotum and prolegs fuscous. Lateral margins of pronotum and supraantennal plates somewhat translucent, costae on frons and mandible fuscous, antennae flavus.

Head: A fifth narrower than pronotum. Clypeus with short longitudinal costa at middle, with two projecting tubercles anteriorly, wings broad, its surface isodiametric reticulated, each with a projecting tubercle, as advanced as tubercles of clypeus, separated from clypeus by a costa at each side, tubercles of clypeus convex on top, those of wings flattened on top; supraantennal plates wide, laterally nearly straight, margins distinctly reflexed margined; supraantennal plates with conspicuous costae running from clypeal wings to posterior quarter of eye. Frons with six conspicuously raised longitudinal costae, two of them running paramedian in parallel from neck to clypeus, converging anteriorly, with a second pair of costae running laterally to the central ones from the neck to anterior eye level, distinctly converging anteriorly, not adjoining the central costae, with a third short pair of costae located laterally at anterior-eye level each in parallel to the costae of the supraantennal plates, interrupted posteriorly. Supraorbital setae located at mid-eye and gena level. Neck composed of a transverse conspicuously raised slightly convex costa, slightly adjoining other costae at extremities. Surface of head covered with distinct isodiametric reticulation, fields of meshes distinctly convex. Eyes subglobose, not as high as supraantennal plates. Genae indistinct.

Antenna subelongate, reaching distinctly over posterior setigerous puncture of pronotum, segments five to ten distinctly longer than wide. Labrum slightly excised, with transverse reticulation, seven-setose. Mandible moderately long, straight at middle part, acute and arcuate nearly hook-like at apex, reflexed margined. Apical segment of maxillary palpomere elongate, securiform, pointed at apex, terminal segment of labial palpomere bottle like, slender apically. Mentum with lateral lobes bidentate, lateral teeth acute, projecting anteriorly, moderately excised between teeth, surface with irregular rugae, central tooth between lobes not as projecting as lateral teeth.

Pronotum (Figs 8, 15): Planate to slightly convex on anterior half of disc (lateral view). Distinctly convex in frontal view. Outline square, wider than long. Lateral margin straight in anterior half, converging, contracted to anterior angle. Anterior angle rounded off by reflexed lateral margin. Reflexed lateral margin subcrenulated. Lateral channel moderately narrow, as wide as two times the width of reflexed lateral margin. Anterior setigerous puncture situated in marginal channel, posterior puncture removed from channel by two times the diameter of puncture. Posterior angle marked by a small tooth. Pleura visible in dorsal view. Anterior margin slightly excised. Anterior transverse line wide, not reaching anterior angles, with conspicuous transverse carina between anterior margin and anterior transverse line, distinctly interrupted at middle. Median line wide, valley-like, joining with anterior transverse line and basal constriction, bilaterally with distinct carina in anterior two thirds. Basal constriction of moderate size, flange with sharp carina. Disc shiny, with small but deep wrinkles of coreacate-like structure, fields between wrinkles distinctly convex, lines of meshes more transverse towards base, fields between meshes convex.

Elytra (Fig. 8): Slightly transversally depressed in anterior third (lateral view). Elongate, sides nearly straight at middle, maximum width at middle. Base truncated nearly straight. Marginal channel moderately wide, running over rounded humerus up to level of fifth stria, series of umbilical setigerous punctures not interrupted. Reflexed margin smooth. Humeral tooth distinct. Striole distinct, elongated. Basal tubercle with setigerous puncture distinct, situated at declivity of first stria, tubercle at declivity of interval three distinct. Striae one to four free at base, all striae deep, indistinctly punctuate-striate. Intervals distinctly convex, carinate apically. Interval three with four setigerous punctures, all approaching stria three. Surface of intervals shiny.

Hind wings: Fully developed.

Ventral description: Proepisternum with dense transverse wrinkles, pleura somewhat swollen postero-laterally. Prosternum smooth, glossy. Abdomen smooth, shiny, laterally with isodiametric reticulation. Last five abdominal sternites with two rows of setae. Abdominal sternum with the two bigger marginal setae separated.

Legs: Profemur dorsally covered densely with transverse parallel wrinkles and irregular reticulation, ventrally with nine transverse carinae. Protibia with the three upper spines elongated, the basal one shorter and rounded off, surface with longitudinal reticulation, movable apical spur distinctly shorter than terminal spine, spur and spines rounded apically, basal tarsomere nearly as long as tarsomeres two to five together. Mesotibia without preapical spine, with four strong setae distally arising from tubercles.

Male genitalia (Fig. 21): Median lobe slender, elongated, in dorsal view distinctly but obtusely angled arcuate at middle, apical part elongated, tip of apex shaped like half of a spoon, with smooth margin. Orofium of moderate size. Internal sac with a bunch of dense bristles preapically. Parameres medium sized, not much distorted, ventral one with two and dorsal one with three long setae at apex.

Female genitalia (Fig. 27): Coxostyli hyaline, slender, flattened, bottle-like shaped in apical half, with stepped tip of apex, with two moderately long nematiform setae in the middle part and one elongated nematiform setae towards apex, with one minute pilus at tip of apex.

Variation: The hind body of the paratype (female) is slightly more slender. The dark macula at base of the elytra is more distinct in the paratype.

DISTRIBUTION: Found at the beach of Soalala which is located in the North-East of Madagascar.

Identification Key to the *Lophocoryza* species

- 1 Interval three of elytron with five setigerous punctures; disc of pronotum covered completely with small upright tubercles; length 2.77-3.13 mm *sechellensis* Basilewsky, 1973
- Interval three of elytron with four setigerous punctures; disc of pronotum without any tubercles 2
- 2 Disc of pronotum meshed with flattened isodiametric reticulation; disc of elytra with oval dark macula at middle; supraantennal plates distinctly excised laterally; length 2.78–3.17 mm *sciakyi* sp. nov.
- Disc of pronotum covered with coreaceate-like irregular structures; disc of elytra without macula at middle; supraantennal plates straight or slightly excised laterally..... 3
- 3 Outline of pronotum square (length/width 0.88); lateral margin of pronotum straight, contracted to anterior angles only; wrinkles of coreaceate-like structure on the disc of the pronotum deep, fields between wrinkles distinctly convex; elytra elongated (length/width 1.95); apex of aedeagus shaped like half of a spoon with smooth margin; length 3.0-3.01 mm *deuvei* sp. nov.
- Outline of pronotum in dorsal view bowl-, vase- or square cup-like (length/width 0.71-0.81); lateral margin of pronotum completely convex or with short straight area directly anterior to midpoint; wrinkles of coreaceate-like structure on the disc of the pronotum flat or moderately deep, fields between wrinkles flattened or moderately convex; elytra subelongate (length/width 1.69-1.88); apex of aedeagus differently shaped (comp. *L. vadoni* with spoon-like tip of apex but crenulated margin)..... 4
- 4 Pronotum distinctly transverse, outline in dorsal view like a wider bowl, lateral margin distinctly crenulated; surface with small coreaceate-like meshes, fine granula and indistinct reticulation; apex of aedeagus shaped like half of a spoon with distinctly crenulated margin; length 4.08–4.91 mm *vadoni* Alluaud, 1941
- Pronotum vase or cup-like shaped, lateral margin with slight indistinct undulation (100-120 times) but not crenulated; surface with small or moderate coreaceate-like meshes..... 5
- 5 Colour fuscous; lateral margin of pronotum convex in its whole length, gently contracted to anterior angles in anterior half, surface covered with rough but flattened coreaceate-like wrinkles 6
- Colour testaceous; lateral margin of pronotum with straight part directly anterior to midpoint, contracted to anterior angles in anterior quarter, surface covered evenly with rough coreaceate-like sculptures; maximum width of elytra at middle; aedeagus in dorsal

- view nearly right-angled arcuate at middle, apical part elongated, tip of apex turned dorsally; length 3.15–3.61 mm..... *hanoti* sp. nov.
- 6 Maximum width of elytra behind middle; pronotum with basal part of the reflexed lateral margin running from posterior angle to base as a straight line; aedeagus of stout shape, small, tip of apex broadly rounded; length 3.51 mm.....
..... *araticeps araticeps* Fairmaire, 1892
- Maximum width of elytra at middle; pronotum with basal part of the reflexed lateral margin running from posterior angle to base as a convex line; length 3.35 mm.....
..... *araticeps omanica* ssp. nov.

Discussion

Obviously and interestingly there are locations on the island of Madagascar where more than one species of *Lophocoryza* occurs, e.g. Tulear near St. Augustin with *L. hanoti* sp. nov. and *L. sciakyi* sp. nov., Soalala with *L. sechellensis* Basilewsky, *L. sciakyi* sp. nov., and *L. deuvei* sp. nov., and Maroantsetra with *L. vadoni* Alluaud and *L. hanoti* sp. nov. (Fig. 28). Bank and coastal habitats are unstable and carabids found there mostly exhibit well developed hind wings allowing parts of the population to escape in case of higher flooding but also to populate newly developed banks. For small members of the Scaritinae tribes Clivinini and Dyschiriini it is not unusual that more than one species of a genus occurs in the same habitat. Well-developed hind wings are documented morphologically in this contribution for all species but as well on the labels of four of the species (“à la lumière”, “to light”).

On the basis of the 44 specimens examined the following summarization can be stated: All specimens were collected at the sea coast and none of them inland. For five of the species collection directly at the beach is documented. A very close distance to the coast can be strongly assumed for the other two species due to the geographic label information. So, psammophil or even psammobiont habitat preferences at marine beaches can be strongly assumed.

The records exhibit a conspicuous disjunctive pattern. The gaps between South Africa, the islands of Madagascar and the Seychelles on the one hand and Djibouti and Oman on the other hand (Fig. 28) are considered to represent a gap in investigation of the coastal habitats of Eastern Africa and the Arabian Peninsula. It is inferred the genus is distributed not only over the coasts of Madagascar and the Seychelles but also along the Eastern African coast and the coasts of the Arabian Peninsula.

The genus *Lophocoryza* belongs to a closer circle of Clivinini genera consisting of *Schizogenius* Putzeys, 1846, *Halocoryza* Alluaud, 1919, and *Psammocoryza* Hogan, 2006. Possible relationships have been discussed by WHITEHEAD (1966, 1972) and HOGAN (2006, 2012). The genus *Coryza* Putzeys, 1867, could be placed into the same group but seems to be more distantly related (WHITEHEAD, 1966, WHITEHEAD & REICHARDT, 1977). Recently, the new subtribe Schizogenia Dostal, 2017, has been erected for this group (DOSTAL, 2017). The genus *Paracoryza* Basilewsky, 1972, was placed into this subtribe as well but seems to be widely more distantly related due to the missing dentation of the clypeus and the missing carinae on the frons.

The most similar genus of *Lophocoryza* is *Psammocoryza*. Beside the numerous costae on the head, the specifically developed digitation of the front tibia and the colour and shape, both of the genera exhibit a series of transverse carinae on the ventral side of the profemur. In addition the female coxostyli are very similar, the male aedeagus shows analogies, and

mandibles, maxillary and labial palpomeres are similar. *Psammocoryza* seems to be the replacement of the genus *Lophocoryza* in the New World.

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