

The genus *Clivina* LATREILLE, 1802 (Coleoptera: Carabidae) in Madagascar, with description of two new species of the subgenus *Leucocara* BOUSQUET, 2009

Alexander DOSTAL

Abstract

Two new species of *Clivina* LATREILLE, 1802, belonging to the subgenus *Leucocara* BOUSQUET, 2009, are described from Madagascar: *Clivina (Leucocara) sakalava* sp.n. and *Clivina (Leucocara) schuhi* sp.n. The Madagascan species of *Clivina* are differentiated in a key and new locality data are added.

Key words: Coleoptera, Carabidae, Scaritinae, Clivinini, *Clivina*, *Leucocara*, Madagascar, new species, identification, key.

Zusammenfassung

Aus der *Clivina*-Untergattung *Leucocara* BOUSQUET, 2009 werden zwei neue Arten aus Madagaskar beschrieben: *Clivina (Leucocara) sakalava* sp.n. und *Clivina (Leucocara) schuhi* sp.n. Die madegassischen Arten der Gattung *Clivina* werden in einem Bestimmungsschlüssel differenziert und mit neuen Funddaten ergänzt.

Introduction

In Madagascar the genus *Clivina* LATREILLE, 1802 is represented by two subgenera, *Clivina* s.str. and *Leucocara* BOUSQUET, 2009. *Clivina* s.str. is characterized by widely set anal setae and a distal spur of the mesotibia, whereas *Leucocara* is characterized and easily distinguishable by closely set pores of the anal sternum and the absence of a spur on the external side of the mesotibia. The three species of *Clivina* s.str. were treated and differentiated in the key by BASILEWSKY (1973: 231 ff.), which is adapted and incorporated in the key below.

Leucocara is distributed world-wide and can be divided into six species groups: the Nearctic and Neotropical *C. americana* group (KULT 1959: 179, BOUSQUET & LAROCHELLE 1993: 103), the Palaearctic *C. laevifrons* group (KULT 1959:179), the Ethiopian groups of *C. madagascariensis* (= *C. natalensis* group) and *C. rugiceps* (KULT 1959: 176 ff.), and the Oriental groups of *C. tranquebarica* (KULT 1951: 17 ff.) and *C. semicarinata* (DOSTAL 2012: 35).

The four hitherto known Madagascan *Leucocara*-species are assigned to the two Ethiopian species groups. The two new species, discovered during recent investigations, are an integral part of the large *C. madagascariensis* species group.

Material and methods

Preserved specimens are mounted on commercially available paper cards. Male and female genital organs were dissected and also glued to the cards beneath the specimens from which they were removed. Label data for examined material are given in full length, with exact label wording, except for the date format, which is transcribed to the format “dd.mm.jjjj”.

Characters: The species descriptions are based on the most distinguishing external characters as defined by BAEHR (2008: 9). Dorsal pores are counted including the preapical puncture. All investigations were performed with a Leica MZ16 binocular microscope with a Planapo 1.0× objective, drawings were performed with a Wild TYP 308700 drawing mirror.

Measurements were taken with a calibrated Leica ocular scale at absolute magnifications of 19.4× for pronotal length and width, and 6.9× for all other measurements.

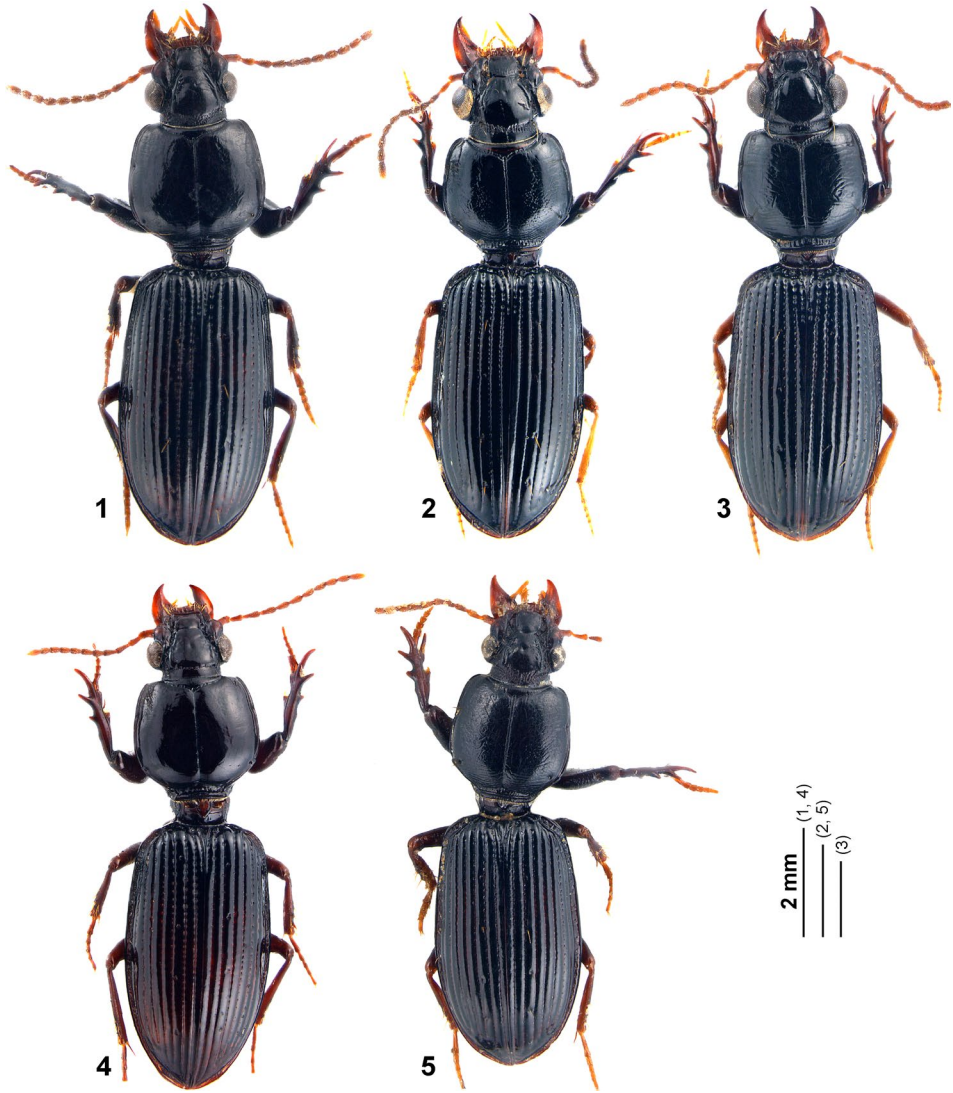
- L** total body length in mm, from apex of mandible to apex of elytra.
W maximum body width in mm (situated at apical third or near mid-length of elytra).
PL maximum pronotum length in mm, measured along median line from base of anterior bristle fringe to base of posterior one.
PW maximum pronotum width in mm, measured normal to midline (situated in most cases close behind middle).
P-LW length-width-index of pronotum (PL : PW); if the value is smaller than 1, it means that the pronotum is wider than long, for values above 1, the pronotum is longer than wide.
E-LW length-width-index of both elytra, calculation same as previous.

Digital photographs were taken with a Leica DFC camera attached to a Leica MZ16 binocular microscope with the help of Leica Application Suite V3, and stacked with Zerene Stacker 64-bit. Processing of images was performed with Adobe Photoshop 7.0.

Taxonomy

Key to the Madagascan *Clivina* species

- 1 Anal sternum with one or two pairs of setiferous pores; if two pairs, they are closely set together near apex. Mesotibia without distal spur, sometimes with a tubercle bearing an apical seta. Marginal channel of pronotum not conspicuously enlarged between the marginal pores. Elytra smooth and shiny, without distinct microreticulation. Colour of mature individuals black. **Subgenus *Leucocara*** 2
- Anal sternum with two pairs of setiferous pores set far apart from each other, the anterior one just behind mid-length of sternum, the posterior one near apex. Mesotibia with distinct distal spur, with a seta inserted laterally before tip. Marginal channel of pronotum conspicuously enlarged between the marginal pores, about twice as wide as in the portion before the anterior marginal seta. Elytra more or less dull, with distinct microreticulation. Colour of mature individuals brown. **Subgenus *Clivina s.str.*** 7
- 2 Anal sternum with one pair of setiferous pores (very rarely and asymmetrically with additional setae, but without additional pores). Last two sterna only weakly punctate in anterolateral portion. Pronotum distinctly wider than long (1.2×); sides more convex.

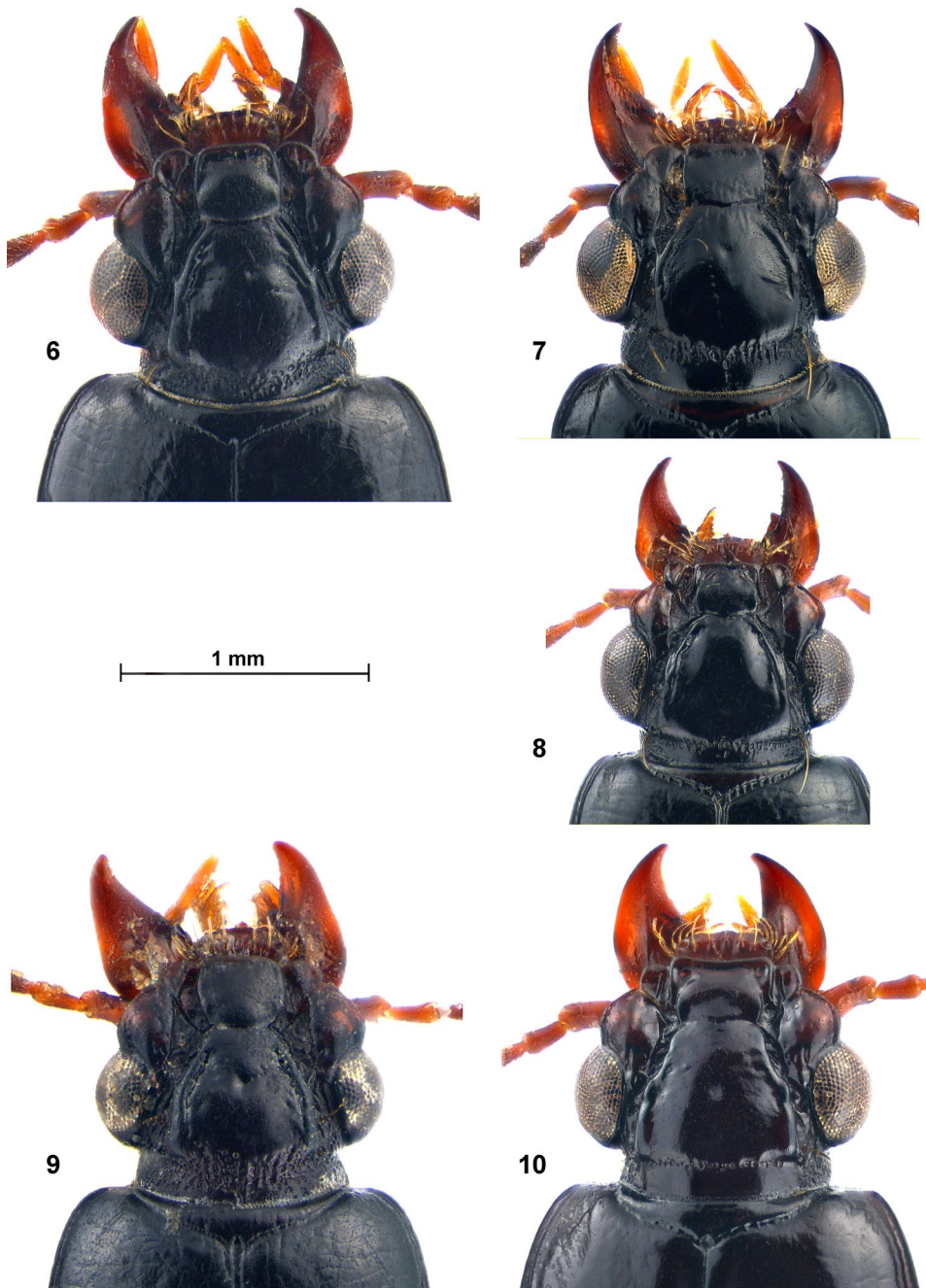


Figs. 1–5: Habitus, dorsal view, of *Clivina (Leucocara)* species: (1) *C. schuhi* sp.n., holotype; (2) *C. sakalava* sp.n., holotype; (3) *C. madagascariensis*, male from Nosy Be; (4) *C. simplicifrons*, female from Madagascar; (5) *C. alluaudi*, holotype (female).

Elytra wider, with more convex sides; intervals rather wide and less strongly convex. Aedeagus median lobe (Figs. 19, 20) long and slender, dorso-ventrally slightly flattened, slightly bent; apex slender ligulate, tip shortly rounded: Left paramere about 3× broader than the right one which is longer (Figs. 21, 22). Body length 6.2–7.5 mm. Widespread in Africa, from Egypt to South Africa, and on Madagascar.

..... *C. rugiceps* (KLUG, 1832)

– Anal sternum with two pairs of setiferous pores. 3



Figs. 6–10: Head and anterior portion of pronotum, dorsal view: (6) *C. schuhi* sp.n., holotype; (7) *C. sakalava* sp.n., holotype; (8) *C. madagascariensis*, male from Nosy Be; (9) *C. alluaudi*, female from Madagascar; (10) *C. simplicifrons*, holotype (female).

- 3 Proepisternum with puncturation. 4
- Proepisternum without puncturation. Punctured area of neck narrow, with a regular single row of punctures in most specimens. 5
- 4 Puncturation of proepisternum coarse, scattered, and restricted to mesal two thirds, lateral third with transverse furrows and microsculpture; suture between proepisternum and prosternum distinct. Anterior margin of clypeus finely bordered. Punctured area of neck broad. Pronotum on disc with few, very fine paramedian punctures; posterior angle with distinct denticle. Sides of elytra distinctly convex, greatest width just behind middle: Anal sternum with distinct puncturation in middle, and with distinct isodiametric microreticulation, more transverse in middle of apical portion. Median lobe of aedeagus (Figs. 11, 12) distinctly bent and dorsoventrally flattened; apex broad ligulate, tip rounded. Left paramere short and broad, almost 4× broader than right one, which is thin and slender in distal third and distinctly broadened towards base (Figs. 13, 14). Body length 6.5–7.1 mm. Madagascar. ... *C. alluaudi* KULT, 1947
- Proepisternum with reduced, fine, loosely dispersed puncturation, smooth and glossy, with very fine transverse wrinkles in lateral third and with hardly detectable microreticulation; suture between proepisternum and prosternum very fine and more or less obsolete in posterior part. Anterior margin of clypeus unbordered and upturned in a shovel-like way. Punctured area of neck narrow. Pronotum with very fine and sparse to obsolete puncturation on disc; posterior angle with indistinct denticle. Sides of elytra slightly convex, greatest width just behind middle. Anal sternum without puncturation but with distinct microreticulation, which is slightly elevated and isodiametric throughout. Median lobe of aedeagus (Figs. 27, 28) distinctly dorso-ventrally flattened, not strongly bent; apex broad ligulate, with obliquely rounded tip. Left paramere broad, about 4.5× broader than right one; apex triangular, more or less continuously broadened towards base (Figs. 29, 30). Body length 6.4–7.25 mm. Madagascar (central-east). ... *C. schuhi* sp.n.
- 5 Pronotum glossy, at most with fine traces of transverse wrinkles. Proepisternum and abdominal sterna glossy. Posterior angle of pronotum with small denticle, not or slightly breaking outline. Striae distinctly punctured in anterior two thirds of elytra, intervals moderately convex. Antennal joints 4–10 subelongate. Mesotibia with a small but distinct tubercle. Antennae, middle and hind legs piceous or dark ferruginous; forelegs black; two basal joints of antenna and palpi brown. Median lobe of aedeagus (Figs. 31, 32) long, slender, dorso-ventrally flattened, distinctly bent; apex slender and narrow ligulate with shortly rounded tip. Left paramere about 4.5× broader than right one, tip acute, slender (Figs. 33, 34). Relatively long and wide species; body length 6.8–7.5 mm. Madagascar. *C. simplicifrons* FAIRMAIRE, 1901
- Disc of pronotum with punctures or distinct transverse wrinkles. Proepisterna with distinct transverse wrinkles. 6
- 6 Disc of pronotum with one pair of paramedian longitudinal groups of dense punctures. Proepisterna in lateral part finely microreticulated. Anterior margin of clypeus without border. Head broad, on average 0.80× maximum pronotal width. Median lobe of aedeagus (Figs. 23, 24) dorso-ventrally flattened, strongly bent; apex stout triangular, somewhat oblique. Left paramere about 4× broader than the right one, distinctly broadened in basal half; distal third long and slender (Figs. 25, 26). Body length 5.5–6.7 mm. Madagascar (Maevatanana, Ankarana). *C. sakalava* sp.n.
- Disc of pronotum without paramedian groups of dense punctures. Microreticulation of outer part of glossy proepisterna missing or very fine. Anterior margin of clypeus distinctly bordered. Head narrower, on average 0.77× maximum pronotal width.

Median lobe of aedeagus (Figs. 15, 16) dorso-ventrally flattened, slightly bent; apex short, ligulate, broadly rounded. Left paramere strongly narrowed in distal half, narrower than in the other species treated herein. Right paramere conspicuously thin and straight (Figs. 17, 18). Body length 5.2–6.1 mm. Widespread in Africa and Madagascar.

- *C. madagascariensis* PUTZEYS, 1846
- 7 On anterior edge of clypeus the middle part at the same level as lateral wings and not separated from them. Proepisterna coarsely punctured. Abdominal sterna distinctly punctured at sides. Body length 5.6–6.0 mm; Madagascar (south).
..... *C. ampandravay* BASILEWSKY, 1973
- On anterior edge of clypeus the middle part laterally protruded into distinct denticles, more or less distinctly separated from wings. Proepisterna not punctured, but with fine wrinkles. Abdominal sterna without puncturation at sides. 8
- 8 Frons slightly convex, smooth, without wrinkles. On anterior edge of clypeus the middle part more protruded than lateral wings. Neck slightly constricted in the middle and more or less at the same level as frons, with puncturation almost interrupted in most specimens. Pronotum almost as long as wide. Apex of middle lobe of aedeagus thin and slender, narrowly rounded, slightly bent ventrally. On average smaller species; body length 4.6–6.5 mm. Madagascar (north and north-east).
..... *C. mocquersyi* ALLUAUD, 1935
- Frons uneven, with shallow wrinkles. On anterior edge of clypeus the middle part more or less at the same level as the lateral wings. Neck usually distinctly constricted in the middle; middle part below level of frons, with puncturation almost continuous. Pronotum slightly transverse. Apex of middle lobe of aedeagus thick, rounded, distinctly bent ventrally. On average longer species; body length 5.5–6.2 mm. Madagascar (south and south-west).
..... *C. seyringi* JEANNEL, 1946

***Clivina (Leucocara) schuhi* sp.n.** (Figs. 1, 6, 27–30, 41, 42)

Type material: Holotype (male): Madagascar East, Reg. Ambatondrazaka, 5 km N of Didy, 1100–1200 m, forêt humide, bord d'un ruisseau, 14–16.01.1995, J. Janak lgt., in coll. Dostal (Vienna). Paratypes: 2 ♂♂, same data, coll. Bulirsch (Prague); 1 ♂, 2 ex., Madagascar Ouest / 30.1.1995, Manindray, E of Sakaraha, 700–800 m, forêt sèche, tamisages, J. Janak lgt., coll. Bulirsch (Prague).

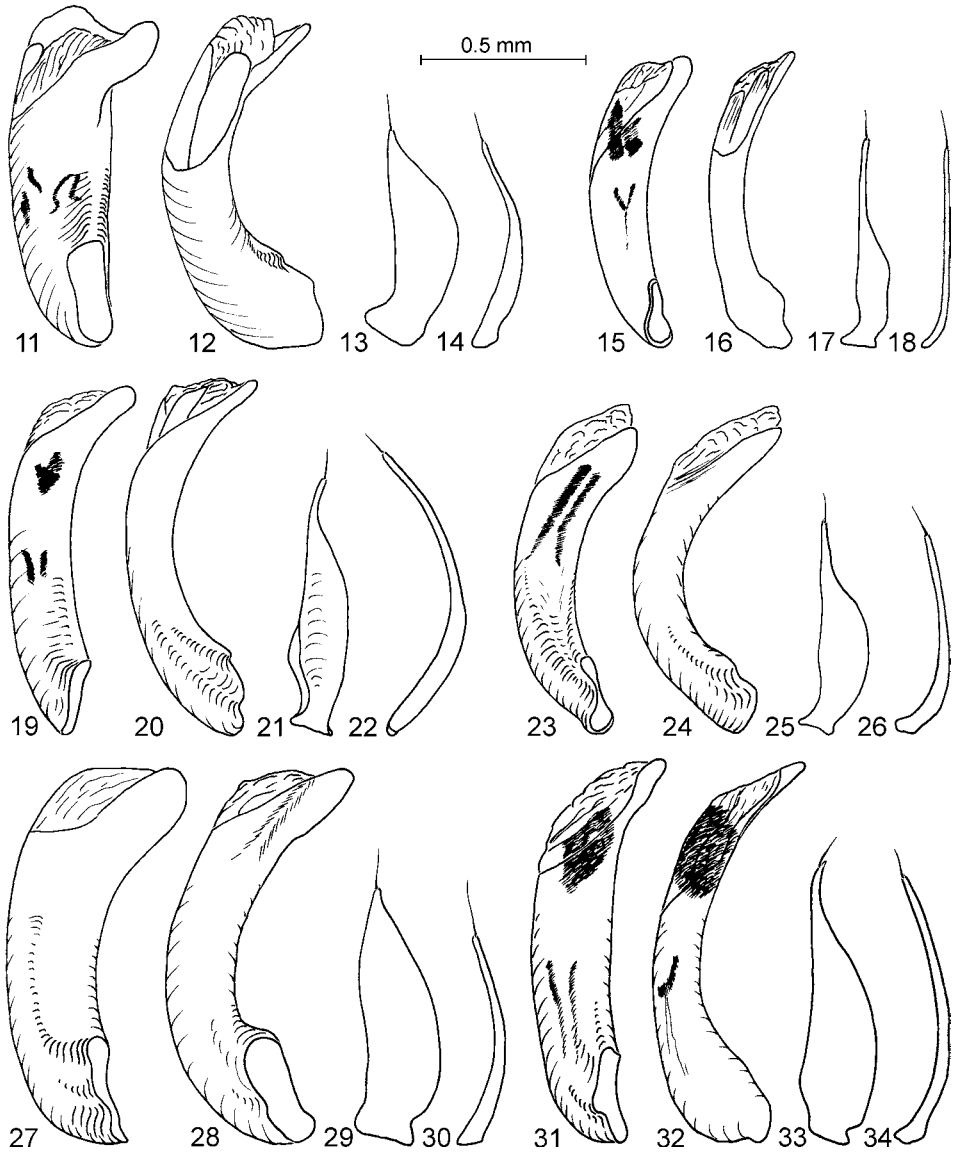
Recognition: A typical species of *Leucocara*, with antennomeres slightly longer than wide; proepisterna smooth, with fine dispersed punctures; elytra smooth and glossy, without any traces of microsculpture.

Description: Measurements (n = 7): L = 6.42–7.25 mm (mean: 6.90 mm, holotype: 7.11 mm); W = 1.84–2.10 mm (mean: 1.99 mm, holotype: 2.07 mm); PL = 1.44–1.65 mm (mean: 1.56 mm, holotype: 1.63 mm); PW = 1.56–1.81 mm (mean: 1.71 mm, holotype: 1.81 mm).

Colour: Unicolorous piceous to black. Legs dark brown; forelegs somewhat darker; tarsomeres and other appendages lighter.

Surfaces smooth and glossy. Microsculpture reduced. Head and pronotum with extremely fine, microscopic puncturation. Mentum surface glossy with distinct microreticulation. Pronotum at base and along sides with fine, more or less isodiametric microsculpture. Elytra with traces of such microsculpture at apex, but still glossy.

Head (Figs. 1, 6) distinctly narrower than pronotum, 0.70–0.72× maximum pronotum width (mean: 0.71×, holotype: 0.70×). Antennomeres 6–10 submoniliform, about 1.4× as long as wide, pubescent from antennomere 3 onwards. Mandibles triangular; left mandible



Figs. 11–34: Genitalia of males: (11–14) *Clivina alluaudi*; (15–18) *C. madagascariensis*; (19–22) *C. rugiceps*; (23–26) *C. sakalava* sp.n., holotype; (27–30) *C. schuhi* sp.n., holotype; (31–34) *C. simplicifrons*. (11, 15, 19, 23, 27, 31) Median lobe, left latero-ventral view; (12, 16, 20, 24, 28, 32) median lobe, lateral view; (13, 17, 21, 25, 29, 33) left paramere, ventral view; (14, 18, 22, 26, 30, 34) right paramere, ventral view.

somewhat broader than right one; inner edge straight, apex acute, shortly bent mesad; both mandibles in basal part with distinct ridge ending at mid-length; lateral border of mandible basally strongly bent mesad, below this border with short, dilated plate. Anterior margin of labrum slightly convex, bordered. Lateral wings of clypeus unbordered and

rounded, as long as middle part; anterior margin of middle part straight, upturned in a shovel-like way; wings of clypeus divided from middle part by deep facial carinae; surface of clypeus slightly convex and glossy, without microsculpture, except for microscopic, fine punctures. Supraantennal plates convex and finely bordered, about as long as wide, separated from clypeus by a fine oblique suture crossing the facial carina. Longitudinal facial carina broad, reaching from level of posterior eye margin to anterior border of clypeal wings; bottom with sparse longitudinal wrinkles, bearing one pair of setae at posterior part of clypeus. Frons glossy, slightly convex, with few transverse wrinkles, with indistinct central foveola, above supraorbital setae with broad ridge reaching to level of anterior eye margin. Neck slightly constricted, with broad uninterrupted band of fine puncturation; at sides behind eye with dense, coarse punctures.

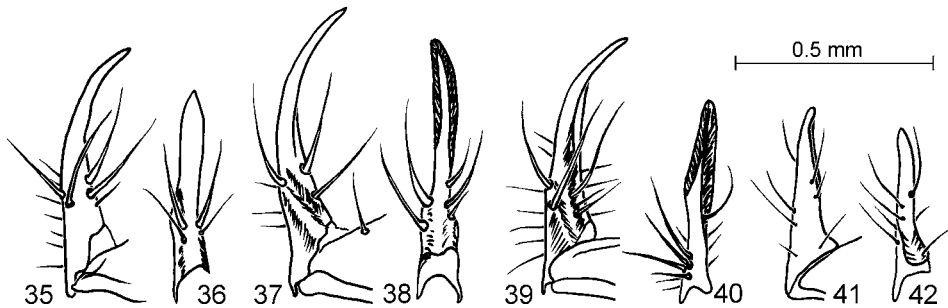
Ventral surface of head: Submentum quadrisetose. Median tooth of mentum with obtuse-angled apex and more or less parallel sides, slightly constricted towards base; base with one pair of setae; sides of mentum wings distinctly constricted anteriorly, their anterior margin straight to slightly convex, continuously rounded with side margin, without antero-lateral denticle; without two slight oblique ridges in basal half, with distinct prebasal torus; basal suture with deep, wide, paramedian, transversely ovate foveae; mentum wings without border, except on inner side next to median tooth. Apex of glossa pointed triangular, unisetose. Penultimate labial palpomere bisetose at sharp inner edge; last labial palpomere straight on outer side, convex and constricted to base on inner side, widest before middle. Last maxillary palpomere straight on outer side, convex on inner side, and constricted towards base, widest before middle.

Pronotum (Figs. 1, 6): P-LW = 0.90–0.93 (mean: 0.91, holotype: 0.90); convex, surface glossy, without microreticulation, except for narrow band along lateral margins and at base; some shallow transverse striae on disc, above base with distinct transverse wrinkles; anterior angle not protruded; posterior angle with a small denticle, not breaking outline; lateral channel fine; basal channel above peduncle about twice as wide as lateral one; anterior transverse sulcus and median line both well impressed, transverse sulcus not reaching edge; anterior sulcus indistinctly punctured. Prosternum smooth and glossy, with fine microreticulation in middle, with deep transverse furrow along anterior margin; suture to proepisternum very fine or obsolete. Proepisternum glossy, with very fine transverse wrinkles along outer edge, without microreticulation, but with fine, but distinct, scattered punctures surrounding procoxa.

Elytra (Fig. 1): E-LW = 1.80–1.90 (mean: 1.84, holotype: 1.83); subparallel, slightly convex at sides; widest behind middle; disc slightly convex, glossy, smooth, without microreticulation except fine traces of microsculpture at base and apex of elytra. Striae of elytra strongly engraved from base to apex, with punctures that are coarse at base and finer towards apex. Interval 3 with four setiferous pores; bases of intervals 7–8 narrowed and slightly elevated to keels for very short section; striae 1–3 free at base; scutellar striae present, punctured, joining scutellar pore that is inserted on a small tubercle; two further tubercles at base in middle of intervals 3–4; intervals slightly convex.

Legs: Protibia with four teeth, proximal one very small, triangular; upper surface with traces of a longitudinal sulcus in middle. Mesotibia without distal spur on upper edge.

Abdominal sterna IV–VI distinctly microreticulated, isodiametrically at sides and more transversely in middle, without puncturation; entire sternum VII with coarse and slightly elevated isodiametrical microsculpture; each side with two marginal setae in both sexes, closely set together, without punctures.



Figs. 35–42: Genitalia of females: (35, 36) *C. madagascariensis*; (37, 38) *C. rugiceps*; (39, 40) *C. sakalava* sp.n., paratype; (41, 42) *C. schuhi* sp.n., paratype. (35, 37, 39, 41) Right stylomere of ovipositor, lateral view; (36, 38, 40, 42) right stylomere of ovipositor, dorsal view.

Male genitalia (Fig. 27–30): Apex of median lobe of aedeagus flattened, obliquely truncated, tip rounded. Left paramere with two fused apical setae, and with a short third one at inner edge, about 4× as broad as right one; apex acute. Right paramere also with two fused setae at apex.

Female genitalia (Figs. 41, 42): Stylus 2 short, straight, slightly bent mesad distally, lanceolate; apex acute; with two long, thin setae and a shorter one on each side in lateral view; in dorsal view slightly asymmetric and basally slightly bent mesally, with four thin setae (two of them also visible in lateral view), membranously attached to stylomere 1, the latter with two thin setae at the dorsal edge.

Collecting details: Collected at the banks of a little brook in the rain forest, and from litter sifting in a dry forest.

Geographical distribution: Central east and southern west of Madagascar.

Specific epithet: Latinized noun, genitive case, an eponym based on the surname of my colleague and friend Rudolf Schuh.

Differential diagnosis: In *Clivina (Leucocara) schuhi* sp.n. the head is conspicuously narrower than the pronotum (0.70–0.72×), compared to *Clivina (Leucocara) sakalava* sp.n. (0.78–0.85×). The proepisternum of *C. schuhi* sp.n. is shiny, with fine puncturation, whereas this plate is coarsely punctured, with a distinct microreticulation in *C. alluaudi*, and lacking puncturation in all other *Leucocara*-species of Madagascar. Further *C. schuhi* sp.n. is different from *C. alluaudi* by its shovel-like, upturned and unbordered clypeus edge and the narrower band of puncturation on the neck.

***Clivina (Leucocara) sakalava* sp.n. (Figs. 2, 7, 23–26, 39, 40)**

Type material: Holotype (male): Madagascar-N, ca. 2 km N Ankarana, S 12° 57' 29.7" E 049° 08' 39.9" 116 m, 19.05.2015, at light, leg. Berger-Dostal, coll. Dostal (Vienna). Paratypes: 1 ♂, 5 ♀♀, same data as holotype; 2 ♀♀, Madagascar-N, Maevatanana env., S 17° 00' 56.7" E 046° 46' 25.8" 65 m, 27.05.2015, at light, leg. Berger-Dostal, all coll. Dostal (Vienna); 2 ex., Madagascar, nr. Kirindy NP, Andranomena Spec. Res., (Andranovory nampela), 20° 08' 52" S 44° 30' 52" E, 27 m, 1–4.02.2013, M. Trýzna leg., coll. Bulirsch (Prague); 1 ♂, 1 ex., SW Madagascar, Morondava dist., 05.01.2002, Miandrivazo, 216 km W of, Antsirabe, D. Hauck lgt., coll. Bulirsch (Prague); 1 ♂, 1 ♀, 6 ex., SW Madagascar, Morondava dist., Kirindy forest, 5–8.01.2002, J. Rolčík lgt., coll. Bulirsch (Prague); 1 ♂, 1 ♀, E Madagascar, Tamatave distr., Andasibe, 17–30.12.2001, D. Hauck lgt., coll. Bulirsch

(Prague); 1 ♂, 1 ex., Madagascar Est, Sambava, 0–20 m, 3.03.1996, River Anovona env., rizières, bord de la forêt, J. Janák + P. Moravec lgt., coll. Bulirsch (Prague); 2 ♂♂, 1 ♀, 7 ex., Madagascar, Mahajanga, 10.12.1996, I. Jeniš lgt., coll. Bulirsch (Prague); 2 ♂♂, 1 ♀, 6 ex., Madagascar, Mahajanga prov., Mahajanga riv., Ampatika env., 10–12.12.1996, I. Jeniš lgt., coll. Bulirsch (Prague).

Recognition: A typical species of *Leucocara*, with antennomeres slightly longer than wide; pronotum with a paramedian, longitudinal group of distinct punctures; elytra smooth and glossy, without any traces of microsculpture.

Description: Measurements (n = 45): L = 5.50–6.68 mm (mean: 6.04 mm, holotype: 5.80 mm); W = 1.60–1.94 mm (mean: 1.77 mm, holotype: 1.69 mm); PL = 1.12–1.43 mm (mean: 1.29 mm, holotype: 1.22 mm); PW = 1.33–1.69 mm (mean: 1.52 mm, holotype: 1.45 mm).

Colour: Unicolorous piceous to black. Appendages lighter, reddish-brown; forelegs somewhat darker.

Microsculpture: Surface smooth and glossy. Head and pronotum with extremely fine, microscopic puncturation. Clypeus glossy, with microscopic fine puncturation and traces of microreticulation in middle and isodiametric microreticulation on wings and along anterior edge. Frons with distinct isodiametric microreticulation along facial carinae and microscopic puncturation on disc. Pronotum glossy, with microscopic fine puncturation on disc, at base and along sides with distinct, more or less isodiametric microsculpture. Elytra smooth and glossy, without traces of microsculpture.

Head (Fig. 2, 7): Broad, 0.78–0.85× maximum pronotum width (mean: 0.82×, holotype: 0.79×). Antennomeres 6–10 submoniliform, about 1.6× as long as wide; pubescent from antennomere 3 onwards. Mandibles triangular; left mandible somewhat broader than right one; inner edge straight, apex acute, shortly bent inwards; both mandibles in basal part with distinct ridge ending at mid-length; outer border of mandible basally strongly bent inwards, below the border with short, dilated plate. Anterior margin of labrum slightly convex, bordered. Lateral wings of clypeus unbordered and rounded, as long as middle part, with its anterior margin upturned in a shovel-like way and straight; wings of clypeus separated from the middle part by deep facial carinae; surface of clypeus slightly convex. Supraantennal plates slightly convex and finely bordered, about as long as wide, separated from clypeus by fine, oblique suture crossing facial carinae. Longitudinal facial carina broad, reaching from level of posterior eye margin to anterior border of clypeal wings; bottom finely wrinkled, bearing one pair of setae at posterior part of clypeus. Frons smooth, glossy, slightly convex, with indistinct to distinct central foveola; above supraorbital setae with broad ridge reaching to level of anterior eye margin. Neck slightly constricted, with narrow band of distinct puncturation, uninterrupted at middle; at sides behind eye with dense, coarse punctures.

Ventral surface of head: Submentum quadrisetose. Median tooth of mentum with a slightly convex truncated to slightly obtuse triangular apex; sides more or less parallel, slightly constricted to base; base with one pair of setae. Sides of mentum wings distinctly constricted anteriorly, their anterior margin slightly convex to straight, forming an angle with lateral margin, without antero-lateral denticle; without oblique ridge, but with distinct prebasal torus. Basal suture with deep, wide paramedian transverse-ovate fovea on each side. Mentum wings without border, except on inner side next to median tooth, their surface glossy, with distinct microreticulation. Glossa with blunt, triangular apex, unisetose. Penultimate labial palpomere bisetose at inner edge. Last labial palpomere straight on outer side, slightly convex and constricted to base on inner side, widest before

middle. Last maxillary palpomere straight on outer side, inner side slightly convex and constricted to base, widest before middle.

Pronotum (Figs. 2, 7) P-LW = 0.81–0.89 (mean: 0.85, holotype: 0.84); convex, disc with distinct transversal striae which become elevated transversal ridges above base, with dense longitudinal group of distinct and fine punctures; anterior angle not protruded; posterior angle with sharp, small denticle, breaking through outline of pronotum; lateral channel fine at sides and base, basal channel above peduncle three times wider than lateral one, wrinkled on surface; anterior transverse sulcus deeply impressed, unpunctured, reaching anterior margin; median furrow well impressed, shallower than anterior transverse sulcus. Prosternum smooth and glossy, border to proepisternum fine and shallow; transverse furrow along anterior margin deep, crenulated, interrupted in middle. Proepisternum glossy, with very fine transverse striae, which are impressed more deeply in lateral half, with distinct microreticulation in lateral half; striae and microreticulation more distinct in females.

Elytra (Fig. 2): E-LW = 1.73–1.89 (mean: 1.81, holotype: 1.82); subparallel, slightly convex at sides; disc slightly convex, glossy, smooth, without microreticulation. Striae of elytra distinctly engraved and punctured from base to apex, with punctures coarse at base, finer towards apex. Interval 3 with four setiferous pores; bases of intervals 7–8 narrowed and elevated to keels for very short section. Striae 1–3 free at base; scutellar striole present, joining scutellar pore that is inserted on a small tubercle; two further tubercles at base in middle of intervals 3–4; intervals slightly convex.

Legs: Protibia with four teeth, proximal one very small, triangular; upper surface with short sulcus in distal fourth. Mesotibia without distal spur on upper edge.

Abdominal sterna IV–VII finely, transversely microreticulated in middle, more isodiametrically at sides, without punctures at side; sternum VII each side with two marginal setae in both sexes, closely set together, in females apex wrinkled.

Male genitalia (Fig. 23–26): Apex of median lobe of aedeagus flattened, triangular; tip rounded. Internal sac with two long and slender bristle fields in distal half. Parameres slender, left one about 4× as broad as right one, both with one apical seta.

Female genitalia (Figs. 39, 40): Stylus 2 long, slender, distinctly bent mesad in distal third, spearhead-shaped; apex acute; laterally with three long and two short setae, dorsally with about 8 short setae, membranously attached to stylomere 1, the latter with about 6 setae.

Collecting details: Collected at light close to a small pond with swampy banks and in the neighborhood of a small brook, respectively; also between rice fields and along a forest edge.

Geographical distribution: Probably spread throughout Madagascar. So far recorded from the northern, northeastern, central, western- and eastern-central parts of the island.

Specific epithet: Latinized noun, nominative, an eponym based on the name of the ethnic group Sakalava living at some locations, where the new species was found.

Differential diagnosis: In addition to the characters mentioned in the key, the head of *Clivina (Leucocara) sakalava* sp.n. is remarkably wider than in the other species treated here: In *C. sakalava* sp.n. the pronotum is only 1.17–1.28× (average: 1.23×; n = 45) as wide as the head, whereas in *C. alluaudi* it is 1.29–1.44× (average: 1.35×; n = 12), in *C. schuhi* 1.38–1.44× (average: 1.40×; n = 7), and in *C. simplicifrons* 1.42× (n = 1) as wide

as the head. There is only a slight overlap of ranges with the most closely related species, *C. madagascariensis*, where the ratio is 1.26–1.35× (average: 1.31×; n = 38).

***Clivina (Leucocara) alluaudi* KULT, 1947, bona species** (Figs. 5, 9, 11–14)

Material examined: Holotype (sex unknown, according to KULT (1947: 34, 1959: 196) a female) and 1 paratype (genital missing, according to KULT (1947: 34) a female): Madagascar, Ambanja, both coll. Dostal (Vienna); 1 ex., Madagascar Est, Maromizaha (Perinet), 20.12.1998, Vybíral Jan lgt., coll. Bulirsch (Prague); 1 ♀, E Madagascar, 17.04.2001, Sensidroa, S of Ambalavao, Manambolo riv., 1200 m, P. Bulirsch leg., coll. Bulirsch (Prague); 1 ex.: Madagascar, Antananarivo, Tsinjoarivo, ca. 1300 m, Chutes de l'Onive, 40 km SE Ambatolampy, 22.10.2001, leg. Schuh, coll. Dostal (Vienna); 1 ♂, Madagascar c., Antsiranana prov., Ambandja, Ambodidimaka r., 15–16.12.2002, I. Jeniš lgt., coll. Bulirsch (Prague); 1 ♀, 2 ex., C Madagascar, Anjozorobe, Soa camp, 1300 m, 10–11.04.2006, primary montane forest, in fungi, G. de Rougemont leg., coll. Bulirsch (Prague); 1 ex., Madagascar, Andasibe-Mantadia N.P., Analamazaotra forest, 2–14.02.2007, M. Trýzna leg., coll. Bulirsch (Prague); 1 ♀, Madagascar, Moramanga env., res. Perinet, 21–23.01.2010, 18°56'49.6" S / 48°25'09.4" E, F. Pavel leg., coll. Bulirsch (Prague).

Remark: *Clivina alluaudi* KULT, 1947 was synonymized with *C. madagascariensis* by BASILEWSKY (1973: 236), and the synonymy subsequently accepted by LORENZ (2005: 143). The comparison of the type of *C. alluaudi* with numerous specimens of *C. madagascariensis* from the African continent and Madagascar has shown that *C. alluaudi* is a distinct species, well defined by the characters outlined in the key above. Unfortunately the dissected genitalia of the holotype and the paratype of *C. alluaudi* are lost (female genitalia were often destroyed by Kult, as these were considered irrelevant for taxonomy).

***Clivina (Leucocara) madagascariensis* PUTZEYS, 1846** (Figs. 3, 8, 15–18, 35, 36)

Material examined: 1 ♂, lex., Madagascar / Mahajanga prov./ Mahajanga riv. / Ampatika env./10.–12.12.1996, I. Jeniš lgt., coll. Bulirsch (Prague); 5 ex., Madagascar, 1–8 km E of Betroka, 800–850 m, 11.12.1998, P. Bulirsch lgt., coll. Bulirsch (Prague); 3 ex., Madagascar WC, Mahajanga prov., Ambodimanga env., Ankofira riv. (Bora), 7–8.12.2002, I. Jeniš lgt., coll. Bulirsch (Prague); 5 ex., N Madagascar, Antseranana distr., Sambirana riv., Marovato vill., 5–12.12.2002, D. Hauck leg., coll. Bulirsch (Prague); 9 ex., SE Madagascar, 12 km NE of Esira, Mandrare riv., 350–400 m, 30.01.2004, 24°16'S, 46°48'E, P. Bulirsch lgt., coll. Bulirsch (Prague); 3 ex., Madagascar, Ankarana res. spec., creek bank, 12°55'S 49°06'E, 5–7.11.2007 J. Štastný lgt., coll. Bulirsch (Prague); 1 ♀, 41/Madagaskar-N, Ambilobe S 13°09'46.5" E 049°03'51.7", 60 m, 17.05.2015, leg. Berger-Dostal, coll. Dostal (Vienna); 1 ♂, 46/Madagaskar-N, Nosi-Be, Madiro, S 13°17'16.4" E 048°13'24.5" 40 m, 21.05.2015, at light, leg. Berger-Dostal, coll. Dostal (Vienna); 4 ♂♂, 2 ♀♀, 47/Madagaskar-N, Nosi-Be, Befokata Bay, S 13°16'43.5" E 048°15'35.7", 25 m, 22.05.2015, at light, leg. Berger-Dostal, coll. Dostal (Vienna); 1 ♂, 49/Madagaskar-N, Nosi-Be, Ambatozavavy env., S 13°22'51.6" E 048°18'45.9" 117 m, 23.05.2015, at light, leg. Berger-Dostal, coll. Dostal (Vienna).

***Clivina (Leucocara) rugiceps* (KLUG, 1832)** (Figs. 19–22, 37, 38)

Material examined: 3 ex., Madag.-mer. or., Midongy, coll. Dostal (Vienna); 1 ex., Madagascar, Ambanja, coll. Dostal (Vienna); 3 ex., Madagascar, Mandritsara, 12.1936, Micheli, coll. Dostal (Vienna); 1 ♂, Madagascar, Tsaratanana, Antsirasa – Morawato env., 24–30.11.2001, leg. I. Andreev, V. Dolin, R. Andreeva, coll. Dostal (Vienna); 1 ♂, 2 ♀♀, Madagascar, Antanandava, 1–2.12.2002, lgt. Mracek, coll. Dostal (Vienna); 1 ♀, Madagascar, Andasibe NP, Lokato, near Andasibe, 10.01.2007, Lgt. Z. Mracek, coll. Dostal (Vienna); 6 ex., Madagascar, Ankarana res. spec., creek bank, 12°55'S 49°06'E, 5–7.11.2007, J. Štastný lgt., coll. Bulirsch (Prague); 1 ex., Madagascar, 21.01.2013, Isalo N.P., Zahavola forest, ca 850 m, M. Trýzna leg., coll. Bulirsch (Prague).

***Clivina (Leucocara) simplicifrons* FAIRMAIRE, 1901 (Figs. 4, 10, 31–34)**

Material examined: 1♂, Madagascar, Compared with type K. Kult 1947, coll. Dostal (Vienna).

***Clivina (s.str.) mocquerysi* ALLUAUD, 1935**

Material examined: 1 ex., Madagascar, Ambanja, Compared with type K. Kult 1946, coll. Dostal (Vienna); 2♂♂, 2 ex., Madagascar, Maroantsetra, Andranofotsy, 04.1938, Vadon!, coll. Dostal (Vienna); 1 ex., Madagascar, Kap Diego, 02.1916, Friedrichs S.G., coll. Dostal (Vienna).

***Clivina (s.str.) seyringi* JEANNEL, 1946**

Material examined: 1 ex., Madagascar, Ambanja, Compared with type K. Kult 1946, coll. Dostal (Vienna); 1♂, Madagascar, Antsiranana, Djangoa env., 13.12.2002, leg. Mracek, coll. Dostal (Vienna).

Acknowledgements

I am very grateful to Mag. Harald Bruckner (Vienna, Austria) for taking the photographs and to Petr Bulirsch (Prague, Czech Republic), Alice Laciny, MSc (Vienna, Austria), Hilde Seyfert (Vienna, Austria) and Dr. Herbert Zettel (Vienna, Austria) for their valuable comments and review of the manuscript.

References

- BAEHR M., 2008: The Australian Clivinini 1. The genera *Ancus* PUTZEYS, *Aspidoglossa* PUTZEYS, *Clivinarchus* SLOANE, *Platysphyrus* SLOANE, *Pseudoclivina* KULT, *Rhysocara* SLOANE, *Syleter* ANDREWES, the subgenera *Paraclivina* KULT, *Semiclivina* KULT, and the *atrata*-, *biplagiata*-, *brevicornis*-, *coronata*-, *coryzoides*-, *cribrosa*-, *debilis*-, *denticollis*-, *grandiceps*-, *incerta*-, *lobata*-, *obliquata*-, *obsoleta*-, *orbitalis*-, *planiceps*-, *sulcaticeps*-, *tranquebarica*-, and *wurargae*-groups of the genus *Clivina* LATREILLE. With a note on a record of the genus *Parathlibops* BASILEWSKY (Scapterini) (Carabidae, Scaritinae). – *Coleoptera* 12: 1–220.
- BASILEWSKY P., 1973: Insectes Coléoptères: Carabidae, Scaritinae. – *Faune de Madagascar*, Paris, 322 pp.
- BOUSQUET Y. & LAROCHELLE A., 1993: Catalogue of the Geadephaga (Coleoptera: Trachypachidae, Rhysodidae, Carabidae including Cicindelini) of America North of Mexico. – *Memoirs of the Entomological Society of Canada* 167: 397 pp.
- DOSTAL A., 2012: Three new species of *Clivina* LATREILLE, 1802 (Coleoptera: Carabidae: Scaritinae: Clivini), from Asia. – *Zeitschrift der Arbeitsgemeinschaft Österreichischer Entomologen* 64: 33–44.
- KULT K., 1947: The 3rd study to the knowledge of tribus Clivinini (Col., Carab.). (18th Contribution to the knowledge of Cartabidae.) *Časopis Československé společnosti entomologické* 44(1–2): 26–37.
- KULT K., 1951: Revision of the genus *Clivina* LATR., from the Oriental region. – *Časopis Československé společnosti entomologické* 48(1): 16–32.
- KULT K., 1959: Revision of the African species of the old genus *Clivina* LATR. (Col. Carabidae). – *Revue de zoologie et de botanique africaines* 60(1–2): 172–225.
- LORENZ W., 2005: Systematic list of extant ground beetles of the world (Insecta Coleoptera “Geadephaga”: Trachypachidae and Carabidae incl. Paussinae, Cicindelinae, Rhysodinae). – 2nd edition, published by the author, Tutzing, 530 pp.

Author's address: Dr. Alexander DOSTAL, Ducheckgasse 39, 1220 Vienna, Austria.

E-mail: dostal.alexander@aon.at

ZOBODAT - www.zobodat.at

Zoologisch-Botanische Datenbank/Zoological-Botanical Database

Digitale Literatur/Digital Literature

Zeitschrift/Journal: [Zeitschrift der Arbeitsgemeinschaft Österreichischer Entomologen](#)

Jahr/Year: 2016

Band/Volume: [68](#)

Autor(en)/Author(s): Dostal Alexander

Artikel/Article: [The genus *Clivina* Latreille, 1802 \(Coleoptera: Carabidae\) in Madagascar, with description of two new species of the subgenus *Leucocara* Bousquet, 2009 77-89](#)