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RESEARCH ARTICLE

Notes on *Kora* and description of a new species from Minas Gerais, Southeast Brazil (Mollusca: Gastropoda: Stylommatophora)

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ABSTRACT. *Kora* Simone, 2012, currently includes three species known only by shell morphology. They are distributed in the states of Bahia and Minas Gerais in central Brazil, where they occur in association with limestone outcrops. Features used to identify them include micro-ornamentation of the protoconch, color pattern, and morphometric data. This paper expands the characterization of the genus through the description of the internal anatomy of two of its species. These features also distinguish a new species, which is described herein. Material was collected manually during several field expeditions to Parque Nacional Cavernas do Peruaçu in northern Minas Gerais. Total height and maximum width, and height and width of the aperture, were measured; the number of whorls determined; and staining patterns typified. The digestive and reproductive systems and pallial complex were characterized for *Kora rupestris* Salvador & Simone, 2016 and *Kora arnaldoi* **sp. nov.**, which are distinguished by the latter possessing a protoconch with a smooth first ½ whorl, a more tapered profile, a jaw with 18 folds, a buccal bulb with a short radular core, and a fertilization complex with only one tubular fold. The two species share a very peculiar pattern of radula teeth compared to other genera of the family, given that they are rupicolous but do not live inside caves. Diagnostic knowledge of the genus was expanded.

KEY WORDS. Land snails, morphology, Megaspiridae, South America, taxonomy.

INTRODUCTION

Simone (2012) established *Kora* in Orthalicidae based on shell characters. The type species, *Kora corallina* Simone, 2012 was described as having "outline fusiform, spire tall, somewhat turriform", "45 mm, color white to brown, peristome white, sometimes with brown spots" and protoconch with two whorls. Three new species were subsequently added from the caves of the municipalities of Carinhanha and São Desidério, state of Bahia, and Presidente Olegário, state of Minas Gerais: *Kora iracema* Simone, 2015, *Kora nigra* Simone, 2015, and *Kora terrea* Simone, 2015, respectively.

An amended diagnosis of *Kora* based on shell morphology, describing it as conical-fusiform, added detail of the sculpture of the protoconch and teleoconch, and established the new species *Kora rupestris* Salvador & Simone, 2016 from Carinhanha, Serra do Ramalho and Coribe, Bahia, and rearranged the genus in Bulimulidae. These authors reallocated the species *K. iracema* and *K. terrea* to *Drymaeus* due to their reticulated protoconch sculpture, a distinct shape of the shell and aperture, and a strongly reflected peristome (Salvador and Simone 2016: 3).

Later, Salvador and Simone (2021) found and illustrated shell samples found in Parque Nacional Cavernas do Peruaçu (PARNA Cavernas do Peruaçu) in Minas Gerais as *K. rupestris*, and *K. nigra*, the latter characterized as "its bulimoid shell, with an initially smooth protoconch that becomes sculptured by well-marked, sinuous axial ribs later on that gradually increase in strength towards the teleoconch". The authors further state that the shell seems to be conservative, differing only in its proportions and absolute size".

Recently, Salvador et al. (2023) performed a phylogenetic study based on molecular data and placed the *Kora* in Megaspiridae. Pilsbry (1904) described Megaspiridae as

having a solid, non-detached, tapered-cylindrical shell with many whorls, the last being straight and without a basal keel; embryonic whorls that are almost smooth, slightly striated or with tubercles, with the last whorls having oblique striations; a small, rounded and slightly oblique aperture with an incomplete peristome; columella with a single lamella, two or three of which are low; and a minimally perforated umbilicus.

Herein, I present new morphological data by describing the soft parts of two species of *Kora* from a rocky outcrop and caves in seasonal deciduous forest areas of PARNA Cavernas do Peruaçu, Minas Gerais, Brazil.

MATERIAL AND METHODS

The National Park (PARNA) Cavernas do Peruaçu encompasses 5,644,832 ha (14°54'–15°15'S; 44°03'–44°22'W; Fig. 1) from the municipalities of São João das Missões, Itacarambi, and Januária, in northern Minas Gerais state, Brazil. It contains limestone outcrops with numerous caves that are of great geological and archaeological importance. The primary phytophysiognomies are cerrado sensu stricto, seasonal semidecidious forest, and evergreen riparian forest (ICMBio 2023).

The studied material comprises shells and preserved specimens collected by manual searches in limestone rocks and leaves on the ground performed throughout the rainy season during the years 2009, 2010 and 2022. The collected material is deposited in the following malacological collections: Museu Nacional, Universidade Federal do Rio de Janeiro (MNRJ; Rio de Janeiro, Brazil); Museu Ciências Naturais, Pontifícia Universidade Católica de Minas Gerais (MCNPUC; Belo Horizonte, Brazil); Museu de Ciências Naturais, Secretaria do Meio Ambiente e Infraestrutura, Governo do Rio Grande do Sul (MCNRS; Porto Alegre, Brazil).

Shells were measured as follows: height (H), width (W), aperture height (ah) and aperture width (aw) were measured with a caliper Mitutoyo (0.01 mm precision). Shell color was determined by comparison with the table of colors in Küppers (1979), and whorl number (wn) was determined following Parodiz (1951). Further details of protoconchs, radulae, and jaws were obtained from SEM electromicrographs, produced at the Image Acquisition and Processing Center, Universidade Federal de Minas Gerais, and the Electron Microscopy Laboratory of the Polytechnic of PUC Minas. Specimens for anatomical study were euthanized by immersion in cold water for approximately 24 hours and then preserved in 70º GL ethanol. Soft parts were extracted from shells and analyzed after dissection of the pallial complex and the reproductive and digestive systems. These systems were drawn under a stereomicroscope with a camera lucida ZEISS Discovery V8. Radulae and jaws were extracted by immersing the buccal bulbs in a sodium hypochlorite solution, after which they were washed with several rinses of water, dehydrated in an alcoholic series, and mounted on stubs for SEM. Obtained data were compared with Simone (2012, 2015) and Salvador and Simone (2016, 2021).

TAXONOMY

Orthalicoidea Martens, 1860 in Albers & Martens, 1860

Megaspiridae Pilsbry, 1904

Kora Simone, 2012

Kora corallina Simone, 2012 (type species)
Holotype: Museu de Zoologia, Universidade de São Paulo (MZSP) HTMZSP 103910.
Type locality: Santa Maria da Vitória, Bahia, Brazil (Simone, 2012).

Kora Simone, 2012, was characterized by the author as: shell fusiform in shape with narrow umbilicus, strongly deflected peristome and tall somewhat-turriform spire; protoconch simple, paucispiral, ornamented by scant axial cords umbilicus; peristome somewhat distal from spire longitudinal axis, thus being deflected; and inner lip with strong, oblique tooth at mid-level. The genus was systematically placed in Orthalicidae sensu Bouchet et al. (2005).

Geographic distribution: Bahia and Minas Gerais states, Brazil.

Kora rupestris Simone & Salvador, 2016

Holotype: Museu de Zoologia, Universidade de São Paulo (MZSP) HTMZSP 12412; Paratypes: MZSP 12.441.
Type locality: Brazil, Bahia, Carinhanha (Salvador and Simone 2016).

Diagnosis: *Kora rupestris* was distinguished from *K. corallina* by protoconch sculpture and thinner profile (Salvador and Simone 2016). Salvador and Simone (2021) featured *K. rupestris* shells from PARNA Cavernas do Peruaçu, which we describe herein as a new species based on evidence from the morphology of the shell and the soft part.

Redescription: shell (Fig. 2A–I) conical-fusiform, brown in color (Küppers $N_{30}A_{80}M_{50}$) with slightly darker body whorl (Küppers $N_{80}A_{50}M_{50}$) and lighter narrow subsutural band (Küppers $N_{10}A_{50}M_{20}$). The studied material contains a morphotype with a darker color pattern (Küppers $N_{70}A_{40}M_{40}$) in all whorls but maintaining the lighter subsutural band (Küppers $N_{40}A_{50}M_{30}$) (Fig. 2B, D). Protoconch (Fig. 2G–I) with two

Figure 1. (A) PARNA Cavernas do Peruaçu map: (B–C) landscape; (D) *K. rupestris* live specimen.

whorls, and a wide and flat core; first whorl smooth, second with delicate discontinuous axial grooves. Teleoconch with wider and straighter grooves than the protoconch. Suture non-crenulated. Aperture oval, slightly inclined relative to columellar axis; columellar axis (Fig. 2E–F) not lamellar. Peristome deflected, wide and with clear columellar lip (Küppers $N_{20}A_{30}M_{10}$); parietal lip not thickened. Dimensions (in mm, n = 30 shells): H = 42.20–48.00; W = 19.45–24.80; ah = 22.95–18.40; aw = 4.00–12.85; wn = 7 ¼.

Softs parts (Fig. 3A–F): cephalopedal mass dark gray (Küppers $N_{70}A_{40}M_{10}$) with grooves forming a reticulated surface on the dorsum and light gray (Küppers $N_{60}A_{40}M_{10}$); ventral region with smooth surface. Genital pore below right ommatophore. Mantle edge, in ventral view, (Fig. 3B) thick, with wide and continuous external lobe, with acuminate angle at end that accommodates the pneumostome. Inner lobe with three thin flaps partially detached from outer lobe one flap adjacent to pneumostome, second extending from pneumostome to median region, third extending from median region to opposite end of pneumostome. Pneumostome circular, flanked by anal slit. Pallial roof, in ventral view (Fig. 3A), with translucent surface with dense embossed venation between edge of secondary ureter and median region of mantle edge. Pulmonary vein anteriorly branched, connected by numerous perpendicular and branched vessels from mantle edge to pericardial cavity. Transverse venation extending to bottom of pallial cavity between kidney and rectum. Kidney elongated, triangular with the most acuminate apex passing through the pericardium. Primary ureter as a lighter band attached to side of kidney; secondary ureter fully closed, running lateral to rectum. Pericardial sac partially opaque, tapered at both ends.

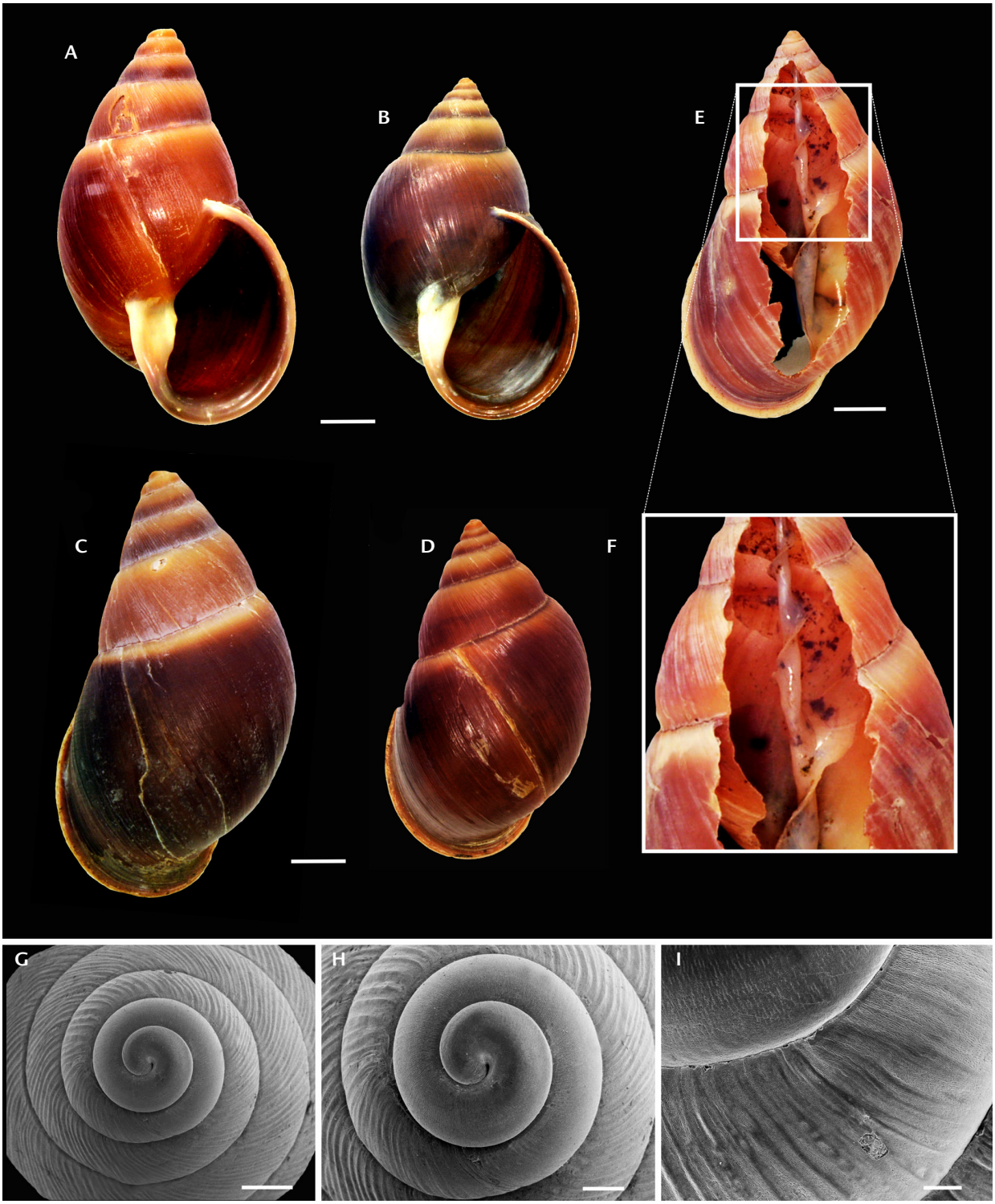

Figure 2. *Kora rupestris*: (A–B) frontal view; (C–D) dorsal view; (A–C) medium brown morphotype; (B–D) dark brown morphotype; (E–F) collumelar axis without extra lamellae; (G–I) protoconch. Scale bars: A–F = 5 mm, G = 500 µm, H = 1 mm, I = 200 µm.

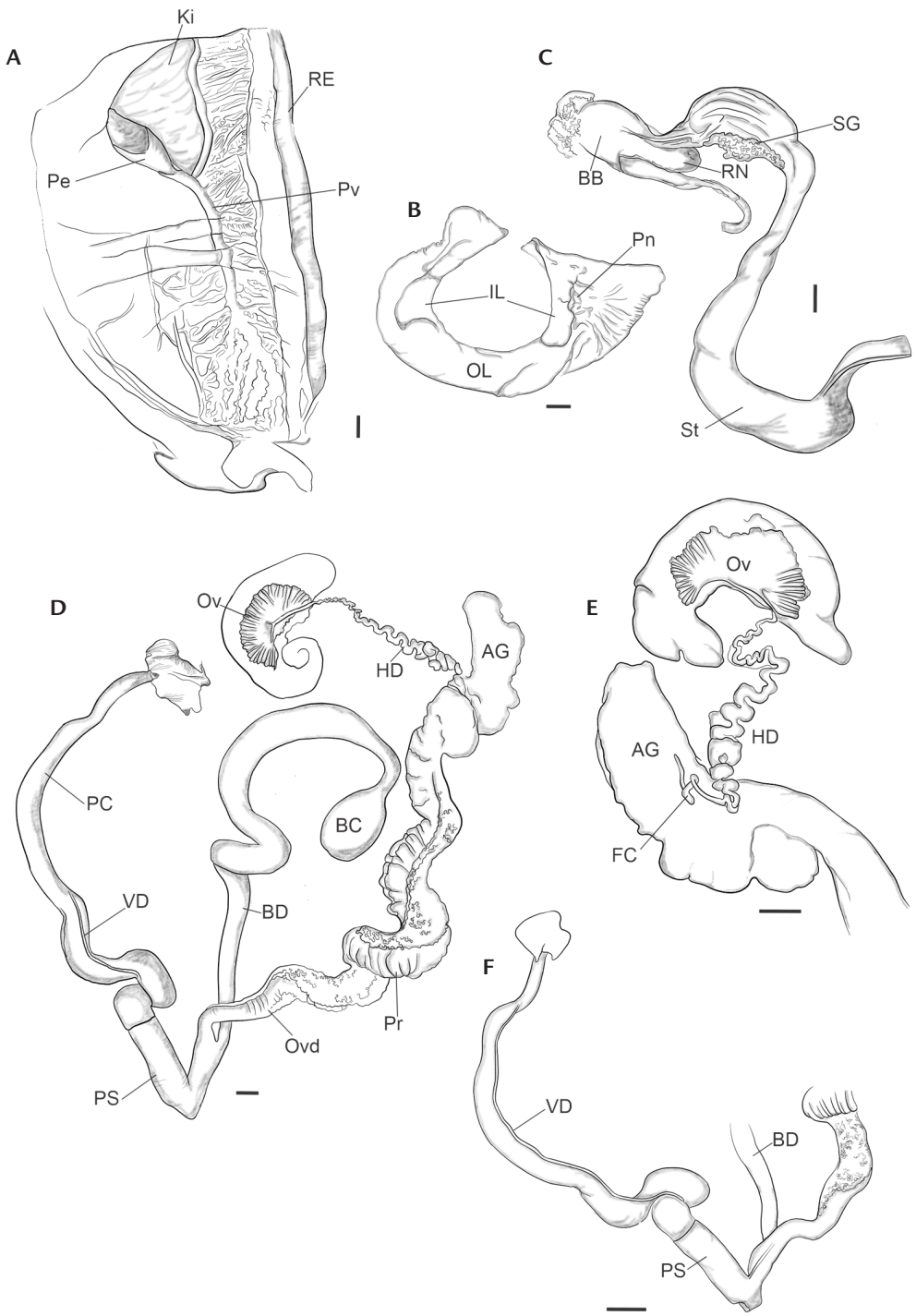

Figure 3. *Kora rupestris*: (A) pallial roof; (B) mantle edge; (C) digestive system; (D) reproductive system; (E) detail showing the fertilization complex; (F) detail showing the vas deferens at the penial complex. (BB) buccal bulb, (BC) bursa copulatrix, (BD) bursa duct, (FC)fertilization complex, (HD) hermaphrodite duct, (IL) inner lobe, (Ki) Kidney, (OL) outer lobe, (OV) ovariotestis, (Ovd) oviduct, (Pe) pericardium, (Pn) pneumostome, (Pr) prostate, (PS) penial sheath, (PV) pulmonary vein, (RE) rectum, (RN) radular nucleus, (SG) salivary glands, (ST) stomach, (VD) vas deferens. Scale bars: 2 mm.

Digestive system: jaw (Fig. 4A) arched, comprising 17 folds of non-uniform widths, central four narrower than distal folds. Radula (Fig. 4B–C): with rows of approximately 102 monocuspid teeth of regular size and shape, without distinction between central, lateral, and marginal teeth. Teeth narrow with long base and free end curved like a hook and slightly pointed; free end of each tooth with an elongated concavity (visualized under higher magnification. Digestive tube (Fig. 3C): buccal bulb with very prominent radular nucleus that is slightly curved upwards. Esophagus diameter wider at crop. Salivary glands latero-basal; each gland with only one duct departing towards dorsal region of buccal bulb where it penetrates each side of the point of junction with the esophagus. Posterior esophagus equal in diameter to stomach. Stomach tubular, recurved, with delicate translucent walls.

Reproductive system (Fig. 3D–F): ovariotestis with single grouping of finger-like follicles with darker distal ends that internally fill digestive gland between third and fourth turn of the visceral mass; delicate tubules depart from various points of the grouping, which, reuniting near distal end of the gonad, form the hermaphrodite duct. Hermaphrodite duct undergoes great thickening, greater pigmentation and becomes coiled reaching ventral face of albumen gland connecting to the fertilization complex. Fertilization complex (Fig. 3E) elongated, tubular, with circular fold at mid-length that directs it upwards; second fold directs blind end forward. Albumen gland voluminous, translucent, short, and widely connected to ovispermoduct. Ovispermoduct long, twisted, uterus walls forming transverse folds throughout its extension. Prostate surface granular, adhered to uterine wall from albumen gland to just before oviduct bifurcation with bursa copulatrix duct. Bursa copulatrix duct originates in the oviduct just below vas deferens exteriorization; diameter constant for approximately 1/5 of its course, dilating slightly, narrowing again for last 1/5 of its course to encounter the bursa. Bursa copulatrix oval; vagina length equivalent to less than half of that of free oviduct. Vas deferens (Fig. 3F) emerging in oviduct just above bursa copulatrix duct bifurcation, descending towards penial complex, passing below muscular sheath of phallus, running externally through phallus and epiphallus, penetrating its limit with flagellum. Penial complex long, tubular, with three convoluted folds along its course; next to the vagina it has a muscular sheath corresponding in length to that of the oviduct. Phallus practically constant in diameter, slightly tapering distally; no external distinction from epiphallus; flagellum short, terminally attached to retractor phallus muscle.

Material examined: Brazil, Minas Gerais, Itacarambi, PARNA Cavernas do Peruaçu, Fazenda ICIL Volta da Serra, Col. Mol. MCNPUC 301 (22 specimens preserved in ethanol), 13 December, 2010, M.S. Pena, A. Suhett, D.C. Souza cols. I; PARNA Cavernas do Peruaçu, Estrada Fazenda Sr Odilon, Col. Mol. MCN PUC 575 (10 specimens preserved in ethanol), December, 2022, J.S. Silva, M.S.Pena, I.Santos Silva cols.; PARNA Cavernas do Peruaçu, ICIL, Volta da Serra, Col. Mol. MCNPUC 249 (51 shells), December 2010, M.S.Pena, A. Suhett, D.C.Souza, cols.

Kora arnaldoi sp. nov.

Figs 5–6

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Holotype: MNRJ 23623, 1 specimen, H = 43mm, W = 18mm.
Type locality: BRAZIL, Minas Gerais, Itacarambi, Cavernas do Peruaçu National Park, Vale dos Sonhos, between crevices of the calcareous stones.

Diagnosis: shell oval-elongate with mammillary apex; light brown; total height more than three times width. Protoconch core lightly recessed, smooth until ½ whorl when it becomes fine and broken; riblets axial; spire shorter than body whorl and body whorl not inflated. Peristome color brownish-rose. Radula teeth with narrow base and curved free end forming single blunt cusp with a short canalicular depression, central tooth not distinct from other teeth. Mandible with 16 narrow central plates flanked by approximately 7x wider plate at each end.

Description: shell (Fig. 5A–B) elongated-oval, solid, rigid; mammillary apex forming angle of 47° or less; umbilicate; light (Küppers $N_{40}A_{50}M_{40}$) to medium brown (Küppers $N_{60}A_{30}M_{40}$); striated axially; 6 ½ slightly convex whorls; total height more than three times width. Protoconch (Fig. 5C) with two whorls; smooth near core until ~½ whorl; with ensuite fine and broken axial riblets; spire shorter than height of elongated body whorl. Aperture vertical, ovate, broadly expanded; peristome color brownish-rose (Küppers $N_{50}A_{40}M_{30}$) with larger posterior projection on body whorl; outer lip rounded, elongated, upper region oblique; basal lip rounded, vertical columellar margin with strong callus, with pleat that varies in size, shape, and position. Columellar axis without lamellae. Dimensions (mm/39 shells): H = 26.30–44.00; W = 9.10–14.80; ah = 9.70–15.50; aw = 4.10–6.90; wn = 7 ¼.

Soft parts: cephalopedal mass dark gray (Küppers $N_{80}M_{20}C_{10}$) with light-brown lateral foot edge. Foot holopodal, light brown, without papillae or ridges. Genital pore

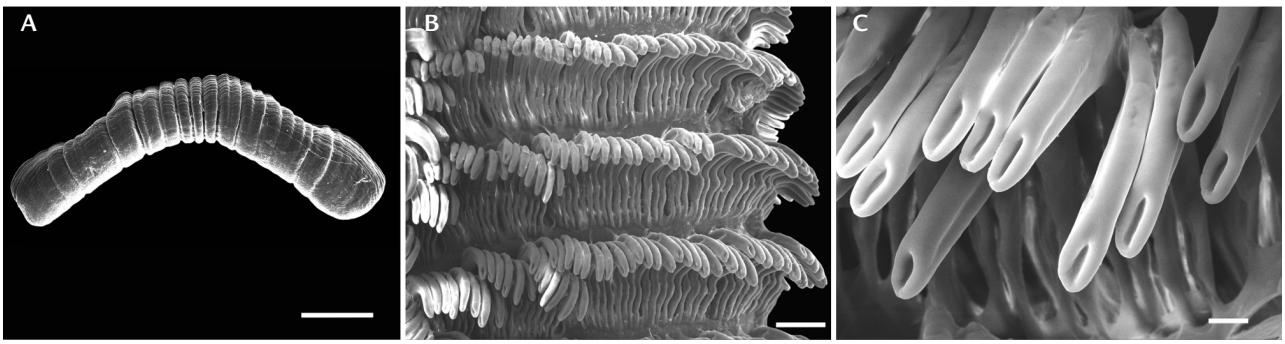

Figure 4. *Kora rupestris*: digestive system: (A) jaw; (B) radula; (C) detail of radula showing canalicular groove. Scale bars: A = 500 µm, B = 50 µm, C = 10 µm.

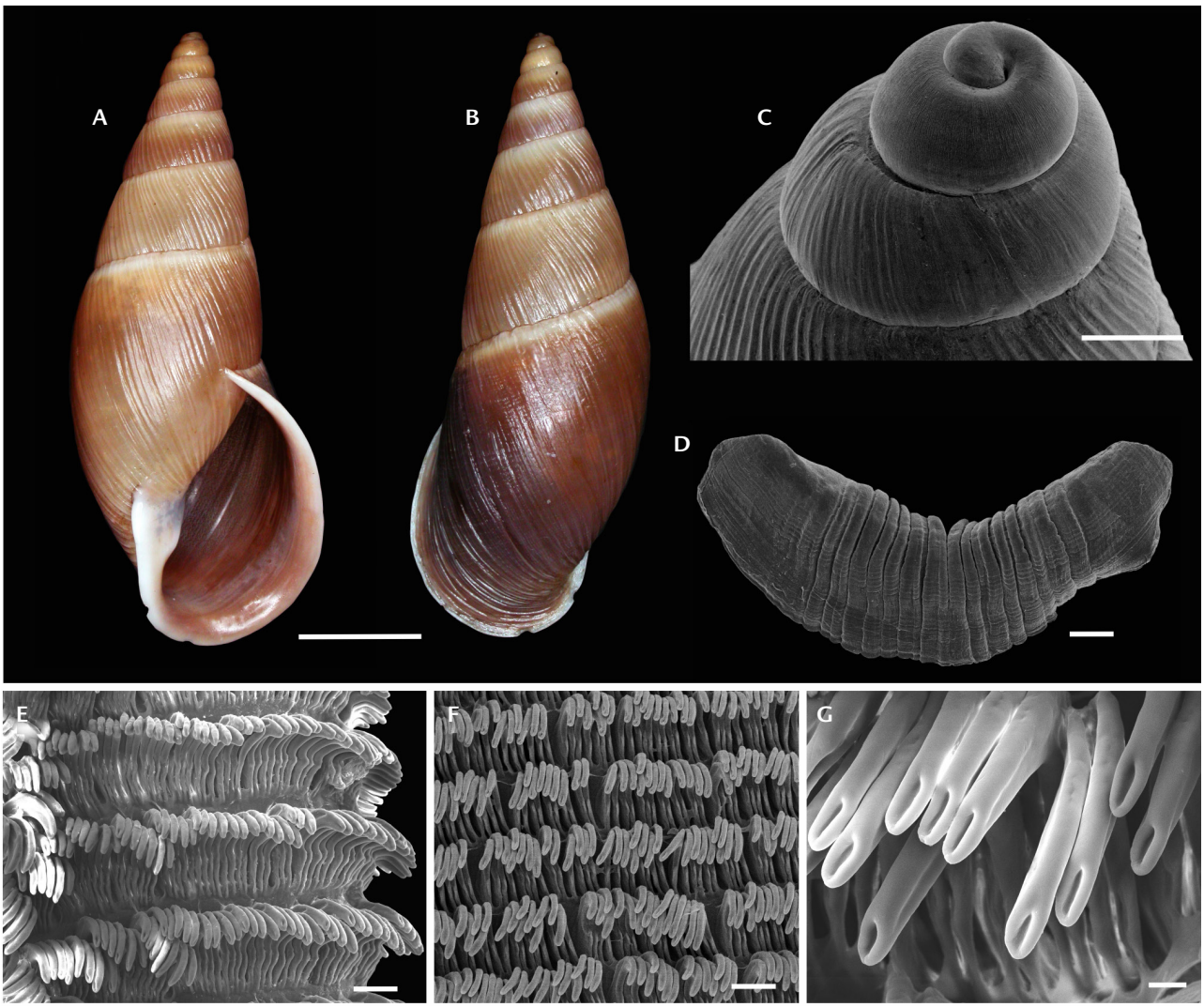

Figure 5. *Kora arnaldoi* sp. nov.: (A) shell frontal; (B) dorsal view; (C) protoconch; (D) jaw; (E–G) radula, including in detail the canalicular groove. Scale bars: A–B = 5mm, C = 1 mm, D = 200 µm, E–F = 50 µm, G = 20 µm.

split located below right ommatophore. Mantle edge (Fig. 6B) with wide outer lobe and narrow inner lobe with horizontal flap covering the pneumostome and narrower flap at opposite end. Pallial chamber roof (Fig. 6A) pigmented with well-dilated vessels near the pneumostome on both sides of pulmonary vein; splits into three or four branches. Kidney approximately triangular and more extensive than pericardium. Pericardium partially opaque, shorter than kidney lateral face and more bulging next to pulmonary vein. Digestive system: jaw (Fig. 5D) with transverse pleating forming 16 narrow central plates flanked by approximately 7x wider plate at each end. Radula (Fig. 5E–G) with numerous indistinct, tubular, and forwardly curved teeth; tooth base slightly wider than free end, forming blunt cusp with a canalicular depression. Digestive tube (Fig. 6C) with buccal bulb possessing homogeneously distributed intrinsic muscles, muscle bundles not easily individualized; radular sac with round end, slightly prominent relative to buccal bulb retractor muscles; pharynx narrow, originating at top of buccal bulb. Salivary glands latero-basal with dark ducts that penetrate short pharynx dorso-laterally and located distally to esophageal crop. Anterior intestine narrow for initial third, extending to twice its initial thickness near the C-shaped stomach; C-shaped stomach with delicate, transparent walls and a typhlosole towards the hindgut. Reproductive System (Fig. 6 D–F): ovariotestis with single cluster of follicles and slender hermaphrodite duct; coiled in its middle portion; albumen gland developed, translucent near junction with ovispermoduct; fertilization complex (Fig. 6F) tubular, elongated at end proximal to the hermaphrodite duct and bent upon itself in the mid-region, which is thicker and lengthened again at its terminal end. Ovispermoduct well developed, translucent, with clear visualization of prostate; vas deferens (Fig. 6E) emerging from prostate above the point of bifurcation of the bursa copulatrix duct, extends superficially along the penial complex to the epiphallus region, later detaching from the surface penetrating the phallus wall. Bursa copulatrix duct tubular with decreasing thickness towards the bursa and starting down the exterior of the vas deferens; bursa copulatrix globular. Penial complex tubular, with short muscular sheath, without differentiation of external areas; flagellum short, terminally attached to phallus retractor muscle.

Type material: Holotype: Brazil, Minas Gerais, Itacarambi, Cavernas do Peruaçu National Park, Vale dos Sonhos, between crevices of the calcareous stones, MNRJ 23623, 1 specimen, H = 43mm, W = 18mm, December 2010, M.S. Pena, D.C. Souza, A. Suhett Cols. Paratypes: Same locality, MNRJ 23624, 9 adults and 6 young preserved specimens, December 2010, M.S. Pena; D. Souza; A. Suhett Cols.; PARNA Cavernas do Peruaçu, Desenho's Cave, MNRJ 23625, 18 adults and 2 youngs, November 2010, M.S. Pena, C. Damasceno, D.C. Souza Cols.; PARNA Cavernas do Peruaçu, Rezar Cave, MCNRS 41956, 41 adult shells, 2 young shells, February/2009, M.S. Pena, M.Carolina, L.Caldeira Cols.

Additional material examined: Brazil, Minas Gerais, Itacarambi, PARNA Cavernas do Peruaçu, Vale dos Sonhos, Col.Mol.MCNPUC 340, 21 shells, January 2022, M.S. Pena, A. Vasconcelos Cols.; PARNA Cavernas do Peruaçu, Bonita Cave, Col. Mol. MCNPUC 218, 25 shels, November 2010, M.S. Pena, C. Damasceno, D.C. Souza Cols.; PARNA Cavernas do Peruaçu, Vale dos Sonhos, Col.Mol.MCNPUC 540, 20 shells, January 2022, M.S. Pena; A. Vasconcelos, J. Silva Cols.; PARNA Cavernas do Peruaçu, Carlúcio's Cave trail, Col.mol. MCNPUC 579, 3 adults specimens, December 2022, J.S. Silva, M.S. Pena, I.S. Silva Cols.

Etymology: the new species is named in tribute (in memoriam) to Dr. Arnaldo C. dos Santos Coelho, an eminent malacologist of Museu Nacional, Rio de Janeiro.

DISCUSSION

The present work provides new information on protoconch micro-sculpture; columella, radula, jaw morphology and soft part anatomy for *Kora*. Diagnostic conchological characters, such as elongated-oval shape, non-inflated body whorl, perforated, and slightly angled protoconch, as well as an expanded peristome, led to the inclusion of *K. rupestris* and *K. arnaldoi* in *Kora*. The features presented here suggest that the studied specimens enlarge the area of occurrence of Megaspiridae to include other areas with the same ecological features and rupicolous habit. Different from the characteristics described for Megaspiridae by Pilsbry (1904) and for *Megaspira adenticulata* Daniel, Ovando & Santos, 2022, both *K. arnaldoi* sp. nov. and *K. rupestris*, as described herein, do not have a lamellated columellar axis, nor a turriform profile with numerous whorls. The uniform pattern of monocuspid teeth with canaliculated free ends is also very different from the pattern described for other representatives of the family, such as *M. adenticulata* and the species of *Thaumastus* described by Pena et al. (2005, 2011). *Kora arnaldoi* sp. nov. and *K. rupestris*, both possess a thin shell; brown coloration with a narrow, light spiral stripe near the body loop suture; an apical angle of ~ 45°; and an expanded and slightly deflected peristome. However, *K. arnaldoi* sp. nov. differs in that all of its whorls are uniformly colored, and its spiral angle never

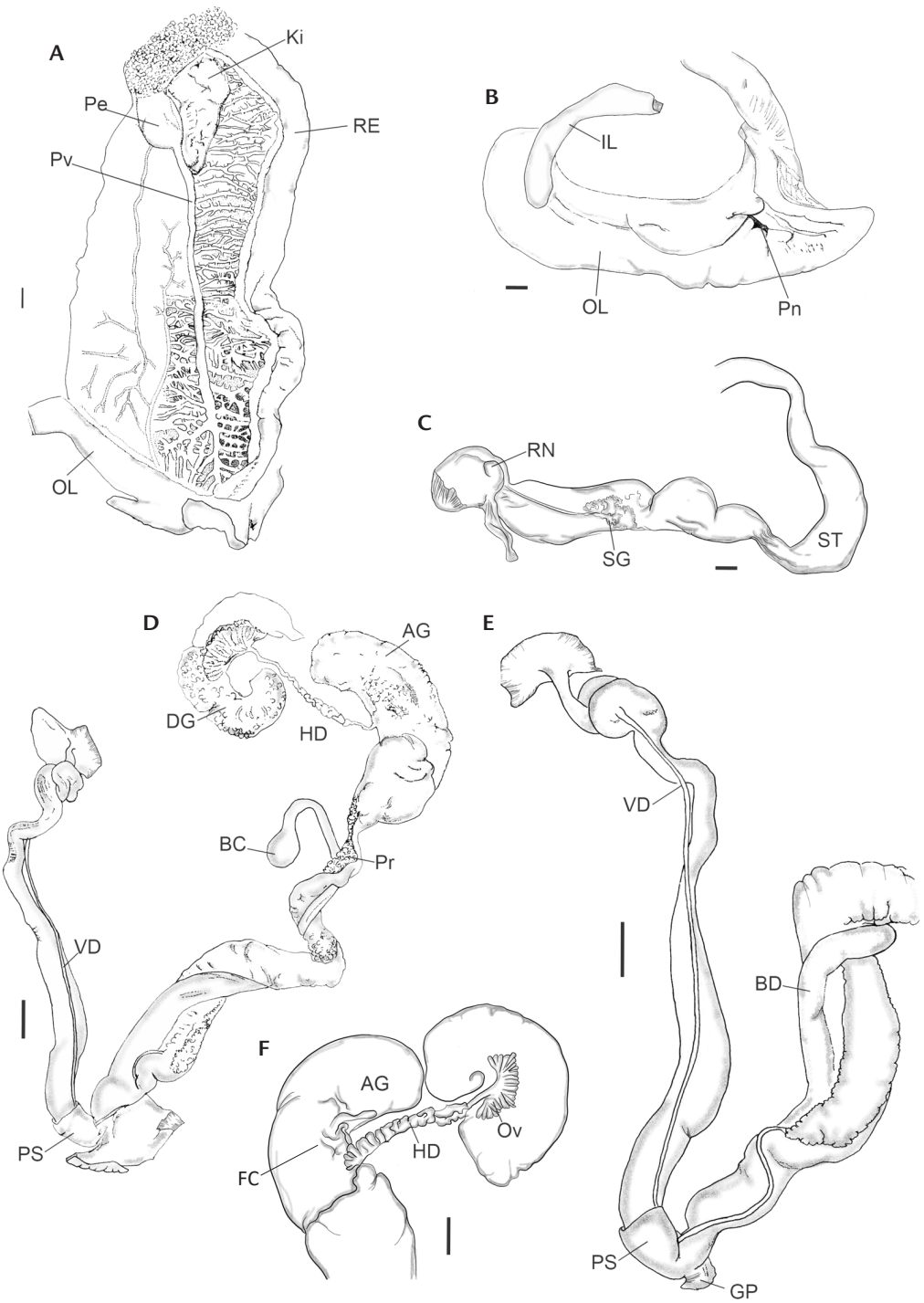

Figure 6. *Kora arnaldoi* sp. nov.: (A) pallial roof; (B) mantle edge; (C) digestive system; (D) reproductive system; (E) detail showing the vas deferens; (F) detail showing the fertilization complex. (AG) Albumen gland, (BC) bursa copulatrix, (BD) bursa duct, (FC) fertilization complex, (HD) hermaphrodite duct, (IL) inner lobe, (Ki) Kidney, (OL) outer lobe, (OV) ovariotestis, (Ovd) oviduct, (Pe) pericardium, (Pn) pneumostome, (Pr) prostate, (PV) pulmonary vein, (RE) rectum, (RN) radular nucleus, (SG) salivary gland, (ST) stomach, (VD) vas deferens. Scale bars: 2 mm.

exceeds 47º (exceeds in *K. rupestris*) Furthermore, it has a shell height/width ratio of less than 2/5; an aperture height less than half of the shell height; pinkish-brown peristome, never white; and a protoconch with fine and broken axial riblets from the first ½ whorl. Both species have a similar lobulated mantle edge, but *K. arnaldoi* sp. nov. has two flaps on the inner lobe. The species also share the same pattern of radula teeth but differ in the number and dimensions of the mandibular folds. The species also differ in the digestive tract, with *K. arnaldoi* sp. nov. having the radular nucleus of the short buccal bulb not curved upwards and an anterior intestine of uniform diameter until near the C-shaped stomach. Aspects of the reproductive system are similar between the species in that they possess only one group of digitiform follicles in the ovariotestis. However, they differ with *Kora arnaldoi* sp. nov. having a proportionally larger albumen gland and a smaller extension of the hermaphrodite duct; only a single fold along the length of the fertilization complex; a bursa duct of uniform diameter throughout its extension; a globose bursa copulatrix; and a shorter phallus muscular sheath.

The novel morphological data presented and discussed here allowed us to characterize the genus *Kora* Simone, 2012, and add *K. arnaldoi* sp. nov. to its current membership of *K. corallina*, *K. nigra* and *K. rupestris*.

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LITERATURE CITED

Albers JC, Martens EC von (1860) Die Heliceen nach natürlicher Verwandtschaft systematisch geordnet von Joh. Christ. Albers. Zweite Ausgabe. Engelmann, Leipzig, 359 pp.

Bouchet P, Rocroi JP, Frýda J, Hausdorf B, Ponder W, Valdés Á, Warén A (2005) Classification and nomenclator of gastropod families. Malacologia 47(1–2): 1–397.

ICMBio (2023) Parque Nacional Cavernas do Peruaçu. Ministério do Meio Ambiente, Instituto Chico Mendes de Conservação da Biodiversidade. Disponível em: https://www.gov.br/icmbio/pt-br/assuntos/biodiversidade/unidade-de-conservacao [Accessed: 10/09/2023]

Daniel VR, Ovando XMC, Santos SB (2022) A new species of *Megaspira* (Stylommatophora: Megaspiridae) from Ilha Grande, Southeast Brazil. Zoologia 39: e21022. https://doi.org/10.1590/S1984-4689.v39.e21022

Küppers H (1979) Atlas de los colores. Blume Editorial, Barcelona, 161 pp.

Parodiz JJ (1951) Métodos de conquiliometria. Physis 58(20): 241–248.

Pena MS, Salgado NC, Coelho AS (2005) New species of *Thaumastus* from Lagoa Santa region, Minas Gerais State, Brazil (Mollusca, Gastropoda, Pulmonata, Bulimuloidea). Iheringia, Série Zoologia 95(1): 21–24.

Pena MS, Salgado NC, Coelho AS (2011) Two new species of *Thaumastus* (Gastropoda: Pulmonata: Orthalicidae: Bulimulinae) from the state of Minas Gerais, Brazil. Zoologia 28(4): 531–537. http://doi.org/10.1590/s1984-46702011000400016

Pilsbry HA (1904) Family Megaspiridae. In: Tryon GW, Pilsbry HA (Eds) Manual of Conchology. Academy of Natural Sciences, Philadelphia, vol. 16, 175–195.

Salvador RB, Simone LRI (2016) A new species of *Kora* from Bahia, Brazil (Gastropoda, Pulmonata, Orthalicoidea) with an emended diagnosis of de genus. Stuttgarter Beiträge zur Naturkunde A, Neue Serie 9: 1–7. https://doi.org/10.18476/sbna.v9.a1

Salvador RB, Simone LRI (2021) New records of Orthalicoidea land snails species for the state of Minas Gerais, southeastern Brazil (Gastropoda, Stylommatophora). Check List 17(2): 395–399. https://doi.org/10.15560/17.2.395

Salvador RB, Silva FS, Cavallari DC, Köhler F, Slapcinsky J, Breure ASH (2023) Molecular phylogeny of the Orthalicoidea land snails: further support and surprises. Plos One 18(7): e0288533. https://doi.org/10.1371

Simone LRI (2012) Taxonomical study on a sample of pulmonates from Santa Maria da Vitória, Bahia, Brazil, with description of a new genus and four new species (Mollusca: Orthalicidae and Megalobulimidae). Papéis Avulsos de Zoologia 52(36): 431–439. https://doi.org/10.1590/S0031-10492012021600001

Simone LRI (2015) Three new species of *Kora* (Pulmonata, Orthalicidae) from Bahia and Minas Gerais, Brazil. Journal of Conchology 42(1): 51–56.

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