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A Revised Catalog Of The Species Of *Stenocrates* Burmeister (Coleoptera: Scarabaeidae: Dynastinae: Cyclocephalini), With Descriptions Of Three New Species From Peru And Brazil And *Stenocrates Inpai* Ratcliffe, 1978 Placed In Junior Synonymy With *Stenocrates Popei* Endrödi, 1971

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A Revised Catalog of the Species of *Stenocrates* Burmeister (Coleoptera: Scarabaeidae: Dynastinae: Cyclocephalini), with Descriptions of Three New Species from Peru and Brazil and *Stenocrates inpai* Ratcliffe, 1978 placed in Junior Synonymy with *Stenocrates popei* Endrödi, 1971

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Abstract

Three new species of the South American genus *Stenocrates* Burmeister, 1847 (Coleoptera: Scarabaeidae: Dynastinae: Cyclocephalini) are described: *Stenocrates serendipitus* Ratcliffe, **new species** and *Stenocrates mimeomus* Ratcliffe, **new species**, both from Amazonian Peru, and *Stenocrates hastatus* Ratcliffe, **new species** from southeastern Brazil. Descriptions, diagnoses, distributions, and illustrations of the parameres of the new species are provided. *Stenocrates inpai* Ratcliffe, 1978, is placed in **new junior synonymy** with *Stenocrates popei* Endrödi, 1971, based upon the examination of additional specimens. A revised, annotated catalog of *Stenocrates* species is provided.

Key Words: taxonomy, scarab beetles, Neotropics, catalog

Serendipity: the effect by which one accidentally stumbles upon something fortunate especially while looking for something entirely unrelated.
—— Wikipedia

The genus *Stenocrates* Burmeister, 1847 has 50 species, including three new species and one new synonym proposed herein. The species are widely distributed from Mexico to Argentina, with most occurring in South America, and one species is known from the West Indies. This is one of the most difficult genera of Dynastinae in the Americas to identify because of the external similarity of the species. Most of the species are externally similar and difficult to nearly impossible to distinguish from one another based upon external characteristics, and so great reliance is made on the form of the male parameres for identification. Most females not associated with males cannot usually be identified with reliability, even by being taken in the same collecting event, since some species are sympatric with one another. Because of the high number of cryptic species in *Stenocrates*, new species continue to be discovered and described.

Unlike most other species in the tribe Cyclocephalini, the males do not have enlarged protarsal claws. Species in the genus are also characterized by a relatively short, subtrapezoidal clypeus that has its apex truncate to slightly emarginate; a distinct frontoclypeal suture; three pairs of punctate striae on the elytra; and the meso- and metafemora strongly flattened. The antenna has 10 antennomeres and a small club. The immature stages remain unknown for all *Stenocrates* species. Life history information is also lacking. The adults are attracted to lights.

Endrödi (1966, 1985) provided the last synopsis of the genus, but 14 new species have been described since that time, including the three new ones described herein. These remain unincorporated in any key (a difficult task when emphasis must be placed on the parameres), and so a new key to species is needed.

Material and Methods

The species descriptions are based on the following characteristics: length from front of the head to the apex of the pygidium; width across the humeri; interocular width (number of transverse eye diameters across the frons between the eyes); form and sculpturing of the head, pronotum, elytra, and pygidium; and forms of the protibia, prosternal process, and parameres. It should be noted that the illustrations of the parameres in Endrödi (1985) are not all entirely accurate (*e. g.*, compare Figs. 12–13 with 14–15). Punctures are considered simple unless otherwise noted. Minute punctures are generally not seen with 12.5X magnification but are easily seen with 50X magnification. Small punctures are easily seen with 12.5X magnification and can be seen with the naked eye. Large punctures are easily seen

without the aid of instruments. Sparse punctures are characterized by numerous puncture diameters between them. Moderately dense punctures have 3–5 puncture diameters between them. Dense punctures have only 1–2 puncture diameters between them or less. Label data is quoted verbatim, and a single slash (/) indicates a break between lines on the same label, and a double slash (//) indicates a different label.

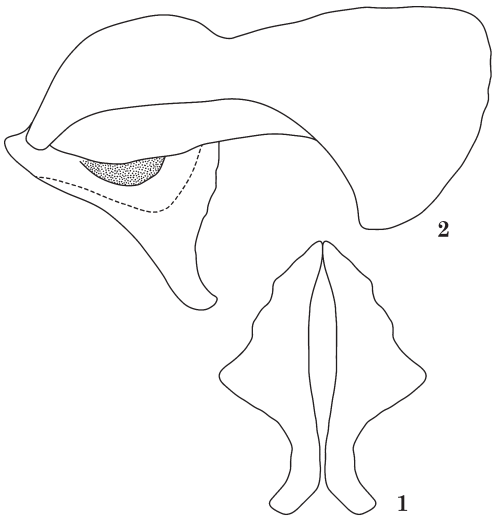
I use the phylogenetic species concept as outlined by Wheeler and Platnick (2000). This concept defines species as the smallest aggregation of (sexual) populations diagnosable by a unique combination of character states.

Results

Stenocrates serendipitus Ratcliffe, new species
(Figs. 1–2)

Type Material. Holotype labeled "PERU: Dpto. Loreto/Quebrada Orán ca 5 km/N Rio Amazonas, 85 km/NE Iquitos, el. 110 m/VI-1984 L.J. Barkley// LSAM/0056622" and with my red holotype label. Holotype deposited at the University of Nebraska State Museum (Lincoln, NE, USA) courtesy of V. Bayless and the Louisiana State University Arthropod Museum (Baton Rouge, LA, USA).

Description of Holotype. Male. Length 18.7 mm; width 8.8 mm. Color black. **Head:** Frons on posterior half shiny, with sparse, shallow micropunctures, anterior half coarsely rugopunctate. Frontoclypeal suture impressed, ridge in front of suture distinctly carinulate either side of middle, ridge obsolete at middle. Clypeus coarsely, transversely rugopunctate; apex weakly emarginate, narrowly reflexed, anterior face thickened. Interocular width equals 3.0 transverse eye diameters. Antenna with 10 antennomeres, club subequal in length to antennomeres 2–7. **Pronotum:** Surface shiny, nearly smooth, with sparse micropunctures on disc and a small field of large, dense punctures in posterior angles only. Lateral margins with thick marginal bead, base without marginal bead. **Elytra:** Surface shiny, with punctate sutural stria and 2 pairs of distinct discal striae and 1 pair of striae behind humerus; each stria comprised of large, deep, closely adjacent punctures. First broad interval with single, irregular row of similar punctures, second broad interval with punctures only on apical fourth. **Pygidium:** Surface shiny, completely and densely punctate, punctures moderately large, glabrous. In lateral view, surface regularly convex. **Legs:** Protibia tridentate, teeth subequally spaced. Metatarsus shorter than metatibia. **Venter:** Prosternal process long, thick; in lateral view, columnar, apex broadly rounded; in ventral view, apex suboval. **Parameres:** Form widest at about middle, apices elongate, slender, curving away from one another (Figs. 1–2).



Figs. 1–2. *Stenocrates serendipitus*, parameres.

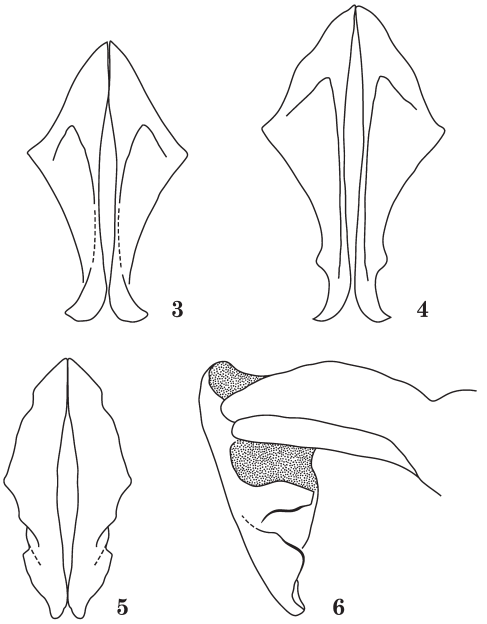
Etymology. The specific epithet means a "fortunate happenstance" or "pleasant surprise," and it is used here in reference to the unexpected discovery of this new species while performing routine identifications of museum specimens. The word serendipity was coined by Horace Walpole in 1754 in a letter he wrote to a friend. Walpole referenced a Persian fairy tale, "The Three Princes of Serendip" [the ancient name for Sri Lanka], where the princes were "always making discoveries, by accidents and sagacity, of things which they were not in quest of" (Anonymous 2014).

Distribution. *Stenocrates serendipitus* is known only from Amazonian Peru.

Locality Record. PERU (1): LORETO (1): Quebrada Orán ca 5 km/N Río Amazonas.

Temporal Distribution. June (1).

Diagnosis. The form of the parameres is essential for distinguishing species of *Stenocrates* because their external body morphology is, with few exceptions, so similar. The overall form of the parameres of *S. serendipitus* resemble somewhat those of *Stenocrates howdeni* Dechambre and Hardy (Fig. 3) and *Stenocrates laborator* (Fabricius) (Fig. 4) in that all are widest at about the middle and with slender apices that diverge from one another. However, *S. howdeni* (Uruguay) does not have the field of large, dense punctures in the pronotal posterior angles (present in *S. serendipitus*), and the parameres are narrower, more elongate overall, and the apices are not as long (compare Figs. 1 and 3). *Stenocrates laborator* (Bolivia, Brazil, Colombia) has a distinct dilation just before the acute apices, while *S. serendipitus*



Figs. 3–6. *Stenocrates* species, parameres. **3)** *S. howdeni*; **4)** *S. laborator*; **5–6)** *S. hastatus*. Illustrations in Figs. 3–4 from Dechambre and Hardy (2004).

has neither the dilation or acute apices (compare Figs. 1 and 4).

Stenocrates hastatus Ratcliffe, new species
(Figs. 5–6)

Type Material. Holotype labeled "BRAZIL: RJ/Rio das Ostras/III-2011 100 m/E. J. Grossi" and with my red holotype label. Allotype with same data and my red allotype label. One male and one female paratype with same data and each with my yellow paratype label. One male and one female paratype labeled "BRAZIL, Esp. Santo/40 k no Linhares/17-19-X-82/Col: Dr. L. Gomez" and each with my yellow paratype label. Two males and one female labeled "Guapi, Braz/Mar.3.1935/ P. Sandig" and each with my yellow paratype label.

Holotype and allotype deposited at the University of Nebraska State Museum (Lincoln, NE, USA). Three paratypes deposited in the US National Museum (USNM) (Washington, DC, currently at the University of Nebraska for offsite enhancement), one paratype deposited in the Museu Naçional (Rio de Janeiro, Brazil), and three paratypes in the B. C. Ratcliffe Collection (Lincoln, NE, USA).

Description of Holotype. Male. Length 20.8 mm; width 10.1 mm. Color black. **Head:** Frons shiny, with sparse micropunctures. Frontoclypeal suture impressed, distinctly broader at middle, ridge in front of suture distinctly carinulate either side of depressed center. Clypeus transversely rugose; apex weakly emarginate, narrowly reflexed, anterior face thickened. Interocular width equals 3.0 transverse eye diameters. Antenna with 10 antennomeres, club subequal in length to antennomeres 2–7. **Pronotum:** Surface shiny, nearly smooth, except for a few small punctures on disc and a field of large, moderately dense punctures in both posterior and anterior angles. Lateral margins with thick marginal bead, base without marginal bead. **Elytra:** Surface shiny, with punctate sutural stria and 2 pairs of distinct discal striae and 1 pair of striae behind humerus; each stria comprised of large, deep, umbilicate, closely adjacent punctures. First broad interval with an irregular row of similar punctures, second broad interval with punctures only on apical third. **Pygidium:** Surface shiny, completely and densely punctate, punctures moderately large, deep, glabrous. In lateral view, surface regularly convex. **Legs:** Protibia tridentate, basal tooth slightly removed from other teeth. Metatarsus incomplete but, if complete, shorter than metatibia. **Venter:** Prosternal process columnar, long, thick, apex flattened into longitudinally oval disc. **Parameres:** Form widest at about middle, apices elongate, lanceolate (Figs. 5–6).

Allotype. Female. Length 21.9 mm; width across humeri 10.4 mm. The allotype does not differ significantly from the holotype. The prosternal process is tapered into an elongate cone.

Variation. Males (5 paratypes). Length 19.5–20.5 mm; width across humeri 9.8–10.6 mm. The male paratypes do not differ significantly from the holotype. The two specimens from Espírito Santo have the pronotum and first broad elytral interval slightly more densely punctate. All paratypes have the second broad interval punctate on the posterior half.

Females (2 paratypes). Length 21.2–21.6 mm; width across humeri 10.3–10.4 mm. The female paratypes do not differ significantly from the allotype except that both have the prosternal process similar to that of the holotype, and the Rio de Janeiro specimen has the second broad elytral interval punctate on the posterior half.

Etymology. The specific epithet is derived from the Latin, *hasta*, meaning a spear, and is used here as *hastatus* to indicate the spear-shaped parameres (Fig. 5).

Distribution. *Stenocrates hastatus* is known from southeastern Brazil.

Locality Records. BRAZIL (9): ESPÍRITO SANTO (2): Linhares (40 km NW). RIO DE JANEIRO (7): Guapimirim, Rio das Ostras.

Temporal Distribution. March (7), November (2).

Diagnosis. *Stenocrates hastatus* will key to *Stenocrates celatus* Prell in Endrödi (1985), and *S. celatus* is the only other species in the genus

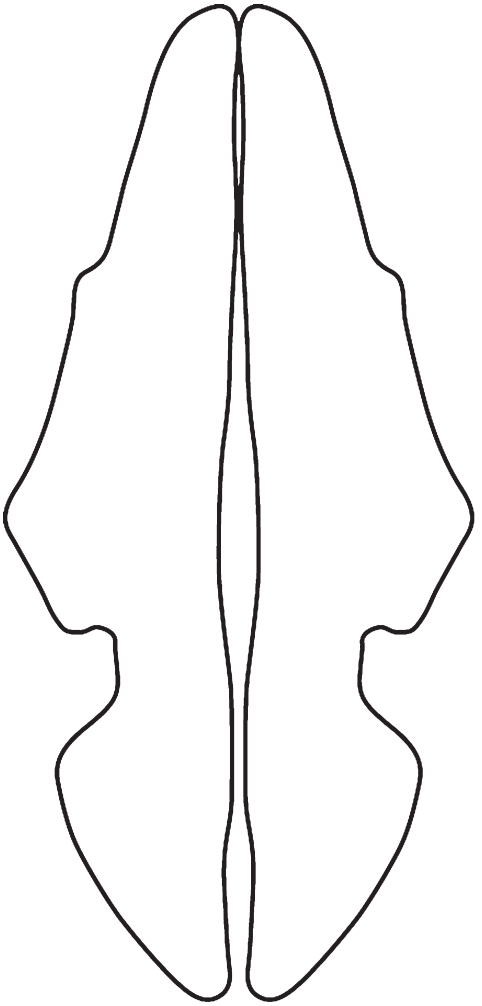
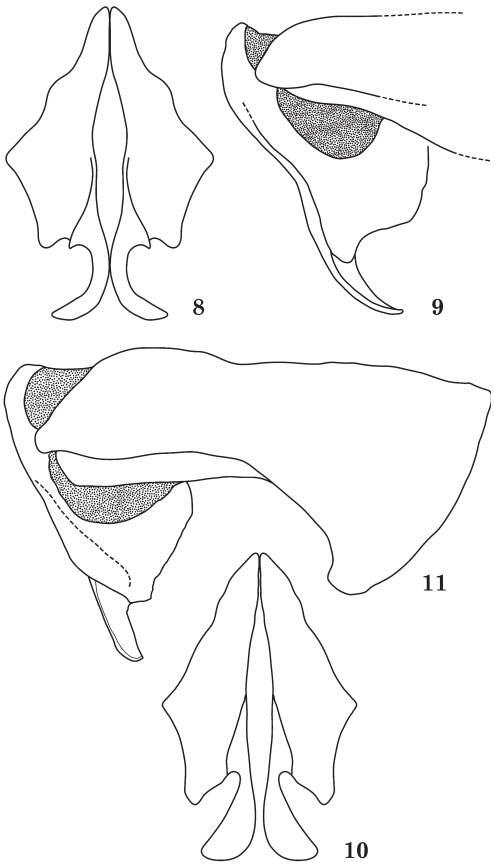


Fig. 7. *Stenocrates celatus*, parameres.



Figs. 8–11. *Stenocrates* species, parameres. **8–9)** *S. mimeomus*; **10–11)** *S. mollis*.

with a lanceolate apex of the parameres. The two species differ in that *S. hastatus* has sparse micropunctures on the frons (with small, dense punctures in *S. celatus*), the pronotum has punctures mostly in the posterior and anterior angles (with large, moderately dense punctures on each lateral third in *S. celatus),* and the parameres are widest at about the middle (widest just below the middle in *S. celatus*) and with their apices narrowly lanceolate (broadly lanceolate in *S. celatus*) (compare Figs. 5 and 7).

Stenocrates mimeomus Ratcliffe, new species
(Figs. 8–9)

Type Material. Holotype labeled "PERU: Madre de Dios;/Rio Tambopata Res; 30 air/km. SW Pto. Maldonado, 290m/16-20 XI 1979 J. B. Heppner/ subtropical moist forest" and with my red holotype label. Allotype female and paratype male each with same data and my red allotype label and yellow paratype label, respectively. Holotype and allotype deposited in the US National Museum (USNM) (Washington, DC, currently at the University of Nebraska for offsite enhancement) and one paratype in the B. C. Ratcliffe Collection (Lincoln, NE, USA).

Description of Holotype. Male. Length 18.4 mm; width 8.8 mm. Color black. **Head:** Frons on posterior half shiny, with sparse micropunctures, anterior half with small, dense punctures. Frontoclypeal suture weakly impressed, ridge in front of suture rounded, not carinulate either side of middle. Clypeus transversely rugose; apex weakly emarginate, narrowly reflexed, anterior face thickened. Interocular width equals 3.0 transverse eye diameters. Antenna with 10 antennomeres, club subequal in length to antennomeres 2–7. **Pronotum:** Surface shiny, nearly smooth, with sparse micropunctures in anterior angles and small field of large, dense punctures in

posterior angles. Lateral margins with thick marginal bead, base without marginal bead. **Elytra:** Surface shiny, with punctate sutural stria and 2 pairs of distinct discal striae and less distinct pair of striae behind humerus; each stria comprised of moderately large, deep, closely adjacent punctures. First broad interval with irregular row of similar punctures, second broad interval with similar punctures on posterior third. **Pygidium:** Surface shiny, completely and densely punctate, punctures moderately large, glabrous. In lateral view, surface regularly convex. **Legs:** Protibia tridentate, basal tooth slightly removed from others teeth. Metatarsus slightly shorter than metatibia. **Venter:** Prosternal process columnar, long, thick, apex obliquely flattened into longitudinally suboval disc. **Parameres:** Form widest at about middle; apices elongate, slender, curving away from one another, and with preapical tooth (Figs. 8–9).

Allotype. Female. Length 19.3 mm; width across humeri 8.8 mm. The allotype does not differ significantly from the holotype.

Variation. Males (1 paratype). Length 18.5 mm; width across humeri 8. 6 mm. The male paratype does not differ significantly from the holotype.

Etymology. The specific epithet is derived from the Latin, *mimeomai*, meaning to imitate and is used here in reference to the fact that most *Stenocrates* species are externally similar to one another.

Distribution. *Stenocrates mimeomus* is known only from Amazonian Peru.

Locality Records. PERU (3): MADRE DE DIOS (3); Tambopata National Reserve (30 air km SW Puerto Maldonado).

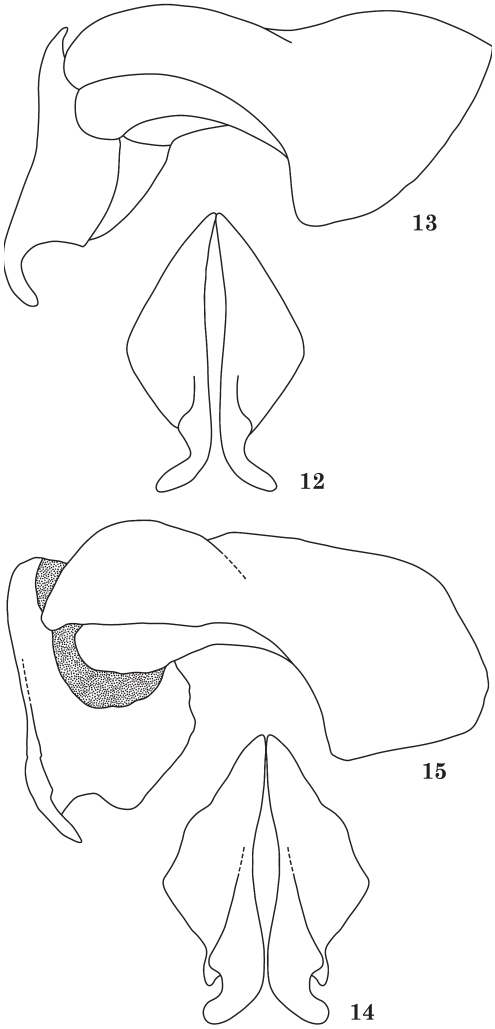
Temporal Distribution. November (3).

Diagnosis. *Stenocrates mimeomus* does not key to anything in Endrödi (1985). The closest would be *Stenocrates mollis* Endrödi from French Guiana, but the parameres are not the same (compare Figs. 8–9 and 10–11, especially the lateral views), the clypeal apex is not deeply emarginate nor sparsely rugopunctate, and the sides of the pronotum are not completely covered by punctures as in *S. mollis*. There is some similarity with *Stenocrates popei* Endrödi based upon similarity of only the parameres, but even those are distinctly different (compare Figs. 8 and 14). Moreover, the ridge in front of the frontoclypeal suture is rounded and not carinulate either side of the middle as seen in *S. popei*.

Stenocrates popei Endrödi, 1971
(Figs. 12–15)

Stenocrates popei Endrödi 1971: 179 (original combination).
Stenocrates inpai Ratcliffe 1978: 491. **New synonymy.**

Endrödi (1971) described *S. popei* from two male specimens, one from "British Guiana" (Guyana) and another with no data. His illustrations of the parameres are in Figs. 12–13. I described (1978) *S. inpai* from a single specimen from Amazonas, Brazil, while in residence there, and my illustrations of the parameres are similar to those of Endrödi. This was during pre-internet days and when the postal system was glacially slow, and I was unaware of Endrödi's paper. During routine identifications of *Stenocrates* species from South America, I found two additional specimens of *S. popei* in the USNM collection. In addition, I re-examined the two specimens of *S. inpai* in my collection and the original descriptions and illustrations of *S. popei* and *S. inpai*. I have concluded that these are the same species,



Figs. 12–15. *Stenocrates popei*, parameres. **12–13)** As illustrated by Endrödi (1985); **14–15)** More detailed illustration.

and both were characterized by imprecise illustrations of the parameres. The illustrations in Figs. 14–15 are a more accurate representation of the distinctive form of the parameres of *S. popei*.

The holotypes of both species were described from Guyana and Brazil, respectively, and the two new specimens just identified are from Suriname, which represents an unsurprising **new country record.** This species is probably present in much of the Guiana shield blackwater forests of French Guiana, Guyana, Suriname, and extreme northern Brazil.

Catalog of *Stenocrates* Species

Krajcík (2005) provided the last catalog of *Stenocrates* species in which he listed 42 species. The revised, annotated catalog below contains 50 species, including the three new species and one new synonym proposed in this paper. Country distributions are gleaned from the literature that describe new species and from specimens in several research collections.

Stenocrates agricola Dechambre and Hardy, 2004. Argentina, Paraguay
Stenocrates amazonicus Ratcliffe, 1978. Brazil, Suriname
Stenocrates ariasi Ratcliffe, 1978. Bolivia, Brazil
Stenocrates batesi Dechambre, 1979. Brazil, Colombia, Ecuador
Stenocrates beckeri Howden, 1970. Jamaica
  Stenocrates davisorum Endrödi, 1979 (synonym)
Stenocrates bicarinatus Robinson, 1947. Southern Mexico to Colombia
  Stenocrates difficilis Endrödi 1966 (synonym)
Stenocrates bolivianus Dechambre, 1979. Bolivia, Brazil
Stenocrates bollei Dechambre, 1985. Brazil, Venezuela
Stenocrates caiporae Ratcliffe, 2014. Brazil
Stenocrates canuli Delgado, 1991. Mexico to Nicaragua
Stenocrates carbo Prell, 1937. Brazil, French Guiana
Stenocrates carinatus Endrödi, 1966. Bolivia, Brazil
Stenocrates celatus Prell, 1937. Brazil, French Guiana, Peru
Stenocrates clipeatus Endrödi, 1966. Bolivia, Brazil, Colombia, French Guiana, Peru
Stenocrates cognatus Endrödi, 1966. Colombia
Stenocrates cultor cultor Burmeister, 1847. Argentina, Brazil
Stenocrates cultor inelegans Arrow, 1913. Bolivia, Brazil, Colombia, Venezuela
  Stenocrates carbunculus Prell, 1937 (synonym)
Stenocrates dubius Endrödi, 1966. Bolivia
Stenocrates duplicatus Endrödi, 1967. Guatemala, Ecuador, Mexico
  Stenocrates frater Dechambre, 2006 (synonym)
Stenocrates eniocanoi Ratcliffe and Cave, 2013. Guatemala, Mexico
Stenocrates haackae Ratcliffe, 1977. Brazil, Ecuador
Stenocrates hardyi Dechambre, 1985. Costa Rica, Nicaragua, Panama
Stenocrates hastatus Ratcliffe, new species. Brazil.
Stenocrates hiekei Endrödi, 1967. Venezuela
Stenocrates holomelanus Germar, 1824. South America east of the Andes
Stenocrates howdeni Dechambre and Hardy, 2004. Uruguay
Stenocrates impeditus Dechambre and Hardy, 2004. Brazil
Stenocrates laborator (Fabricius, 1775). Bolivia, Brazil, Colombia, Paraguay
  Stenocrates australis Endrödi, 1973 (synonym)
Stenocrates laceyi Ratcliffe, 1978. Brazil
Stenocrates lachaumei Dechambre, 1985. Bolivia, Mexico?
Stenocrates laevicollis Kirsch, 1871. Mexico to Colombia
Stenocrates latus Dechambre, 1979. Brazil, Ecuador
Stenocrates lecourti Dechambre, 2006. Panama
Stenocrates lichyi Dechambre, 1979. Brazil, Venezuela
Stenocrates ligneus Arrow, 1911. Brazil, Colombia, Paraguay
Stenocrates mahunkai Endrödi, 1973. Bolivia, Ecuador
Stenocrates mimeomus Ratcliffe, new species. Peru
Stenocrates minutus Endrödi, 1966. Bolivia, Brazil, Ecuador, Peru
  Stenocrates rabanii Ratcliffe, 1977 (synonym)
Stenocrates mollis Endrödi, 1966. Brazil, French Guiana
Stenocrates nasutus Dechambre, 1979. Peru
Stenocrates omissus Endrödi, 1966. Bolivia, Brazil, Colombia, Ecuador
Stenocrates pereirai Endrödi, 1969. Brazil
Stenocrates popei Endrödi, 1971. Brazil, French Guiana, Guyana, Suriname
  Stenocrates inpai Ratcliffe, 1978 (synonym)
Stenocrates porioni Dechambre, 1985. Argentina, Bolivia
Stenocrates pseudoligneus Dechambre and Hardy, 2004. Bolivia
Stenocrates rionegroensis Ratcliffe, 1978. Brazil
Stenocrates rufipennis Fabricius, 1801. Argentina, Brazil, Colombia, Ecuador, French Guiana, Guyana
Stenocrates rugulosus Endrödi, 1966. Venezuela
Stenocrates serendipitus Ratcliffe, new species. Peru
Stenocrates spinosus Ponchel and Dechambre, 2003. Brazil, French Guiana
Stenocrates varzeaensis Ratcliffe, 1978. Brazil

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S. serendipitus available for study and for permission to retain it in the University of Nebraska State Museum collection. I thank Angie Fox (University of Nebraska State Museum, Lincoln, NE, USA) for her valuable assistance with the line drawings. This work was supported, in part, by a Biotic Surveys and Inventory Grant from the National Science Foundation (DEB0716899) to B. C. Ratcliffe and R. D. Cave.

References Cited

Anonymous. 2014. Serendipity. Wikipedia, the Free Encyclopedia. en.wikipedia.org/wiki/Serendipity (accessed 20 December 2014).

Endrödi, S. 1966. Monographie der Dynastinae (Coleoptera, Lamellicornia). I. Teil. Entomologische Abhandlungen 33: 1–460.

Endrödi, S. 1971. Über neue und bekannte Dynastinen (Col., Melolonthidae). Folia Entomologica Hungarica (Series Nova) 24: 179–183.

Endrödi, S. 1985. The Dynastinae of the World. Dr. W. Junk Publisher, Dordrecht, The Netherlands.

Ratcliffe, B. C. 1978. New species of *Stenocrates* from Brazil (Coleoptera: Scarabaeidae). Acta Amazonica 8: 489–495.

Wheeler, Q. D., and N. I. Platnick. 2000. The phylogenetic species concept (*sensu* Wheeler and Platnick) [pp. 55–69]. *In*: Species Concepts and Phylogenetic Theory. A Debate (Q. D. Wheeler and R. Meier, editors). Columbia University Press, New York, NY.

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