

A new genus and species of Oxycarenidae (Hemiptera, Heteroptera, Lygaeoidea) from Argentina

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Abstract

The new genus *Notocoderus* and the new species *N. argentinus* are described from Buenos Aires Province, Argentina, based on two specimens taken in pitfall traps. Dorsal and lateral digital images of this new subbrachypterous oxycarenid and *Dycoderus picturatus* Uhler, known only from Arizona and Colorado in the United States, are provided and their relationships with each other and other oxycarenids are discussed. A lectotype for *D. picturatus* is designated.

Keywords

New World, lygaeoid, oxycarenid, *Notocoderus* gen. n., *argentinus* sp. n., distribution, *Dycoderus*, relationships

Introduction

The Oxycarenidae comprise a small family of Lygaeoidea, with 22 genera known worldwide (Slater 1964, Slater and O'Donnell 1995, Péricart 2001). They are characterized by ventral spiracles on abdominal segments III to VII, with only II dorsal; lack of lateral trichobothria on sterna III, IV, and V and a median trichobothrium

on segment V, three lateral trichobothria on sternum VI and two on sternum VII; a combination of lacking a hamus and the presence of intervannals on the hind wing; widely separated posterior coxae; absence of laterotergites; scent gland openings between terga IV to V and V to VI; and abdominal sternal sutures complete to margin (and fusion of sterna III, IV, and V is common). Henry (1997), who accorded the Oxycareninae family status, noted that the truncate female abdomen and the two transverse combs of glandular setae on abdominal segment VII in males are unique in the Pentatomomorpha.

Only five genera are recorded from the Western Hemisphere. *Anomaloptera* Amyot and Serville is represented by 17 New World species (Slater 1964), all of which, except one (Dellapé and Cheli 2007), previously were included in the synonymic genus *Crophius* Stål (Hoberlandt 1987). The monotypic genus *Dycoderus* Uhler was established to accommodate *D. picturatus* Uhler from the western United States (Uhler 1901), and *Neaplax* Slater, also represented by only one species, *N. mexicana* Slater, was described from Mexico (Slater 1974). The Palearctic genus *Oxycarenus* Fieber is represented by the introduced *Oxycarenus hyalinipennis* (Costa), a potential pest species now widely distributed in South America and the West Indies (Slater and Baranowski 1994). The species *Macroplox variegata* (Curtis 1835), described from northern Canada (Breddin 1902, Slater 1964), has not been recognized since its original description and almost certainly is not an oxycarenid.

In this paper, we describe the new genus *Notocoderus* and the new species *N. argentinus* from Argentina, based on a male and female collected in pitfall traps from southern Buenos Aires Province. *Dycoderus* (and its only included species *D. picturatus*) is redescribed and its relationship with *Notocoderus* is discussed. Dorsal and lateral digital images of both species are provided to help facilitate recognition.

Materials and methods

Color images of *D. picturatus* and *N. argentinus* were captured using an EntoVision Imaging Suite that included a JVC KY-75 3CCD digital camera mounted to a Leica M16 zoom lens via a Leica z-step microscope stand. Multiple focal planes were merged using Cartograph 5.6.0 (Microvision Instruments, France) software.

The following acronyms are used for specimen depositories cited in this paper: MLP (Museo de La Plata, La Plata, Argentina) and USNM (National Museum of Natural History, Smithsonian Institution, Washington, DC, USA).

Results

Notocoderus Henry & Dellapé, gen. n.

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Type species: *Notocoderus argentinus* sp. n.

Diagnosis. *Notocoderus* is distinguished by the coarsely punctate head, pronotum, and scutellum; the lack of ocelli; the bilobed pronotum with the lobes separated by a deep transverse impression, the strongly convex anterior lobe and much shorter, narrower posterior lobe bearing a tubercle at each posterolateral angle; the ostiolar auricle extended upward and outward into a stout, tuberclelike spout; and the swollen fore femur, armed below with a small spine on distal third.

Description. Total length 2.50 mm, width across hemelytra 0.80 mm. Head, pronotum and scutellum coarsely punctate; hemelytral punctures more sparse and shallow. Dorsal surface with scattered, erect, simple setae; setae longer and more dense on head and pronotum. Head globose; bucculae large and prominent, occupying nearly total length of ventral surface, ending posteriorly well past midlevel of eye, encompassing all of first rostral segment and basal half of second. Eyes small, ocelli absent. Pronotum strongly constricted, divided into two lobes separated by a distinct transverse impression; anterior lobe largest, strongly convex; posterior lobe shorter and narrower with a tubercle at each posterolateral angle. Hemelytron subbrachypterous, convex, wider than and overlapping abdomen by nearly half the width; corial margin narrowly explanate, with a row of coarse punctures along inner margin; membrane sclerotized, convex, without veins, lateral margins narrowly explanate; proportionate length of corium to length of membrane 1.78. Metathoracic scent gland auricle elongate, extending upward and outward, forming a tuberclelike spout; evaporative area covering about half of metapleuron. Metacoxae widely separated. Fore femora moderately incrassate, armed below with a small spine on distal third. Abdominal sterna III to VI fused, posterior margin of sternite VII in males with two transverse combs of glandular setae on either side of midline.

Etymology. The name *Notocoderus* is taken from the Greek “*notos*,” meaning south, and the suffix “*coderus*,” taken from the generic name *Dycoderus*, to reflect the overall similarity of this new southern hemisphere taxon with Uhler’s genus. The gender is masculine.

Discussion. *Notocoderus* clearly is most similar to the Nearctic genus *Dycoderus* in overall appearance, including the general shape of the head and pronotum and color pattern of the hemelytra. It can be distinguished from *Dycoderus* by the lack of ocelli; the more strongly convex anterior pronotal lobe, the more deeply constricted transverse impression, and shorter and narrower posterior lobe with a distinct tubercle (absent in *Dycoderus*) at each posterolateral angle; the longer, tuberculate metathoracic auricle (more distinctly visible from dorsal aspect than in *Dycoderus*); the much smaller subapical spine on the fore femur; and the narrower, more cylindrical abdomen.

Slater (1974) mentioned that there are two groups of Oxycarenidae, according to their general habitus. One includes those with somewhat broadened, ovoid, flattened bodies and tapering porrect heads, such as *Crophius* (now treated as a junior synonym of *Anomaloptera* [Hoberland 1987]; however, we note that this synonymy needs reevaluation), *Oxycarenus*, and *Dycoderus*, and a second composed of relatively slender species with rounded myrmecoid heads and frequently swollen, convex pronota, such as *Neaplast* and the Palearctic genera *Bethylimorphus* Lindberg and *Bycanistellus* Reuter. Although Slater's two groups are generally diagnostic, *Notocoderus* and *Dycoderus* are clearly more closely related to each other, based on the rounded (not porrect) heads and strongly bilobed pronota, than they are to either *Crophius* (or *Anomaloptera*) or *Oxycarenus*.

***Notocoderus argentinus* Henry & Dellapé, sp. n.**

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Figs 1–4, 7–12

Diagnosis. This species is best recognized by the small size, the strongly convex anterior pronotal lobe (Figs 1, 4), the narrow and shorter posterior lobe with a distinct tubercle at each humeral angle (Figs 2, 3), and the dull brown hemelytron (Fig. 1), with a white mark on the basal third and apex of the corium.

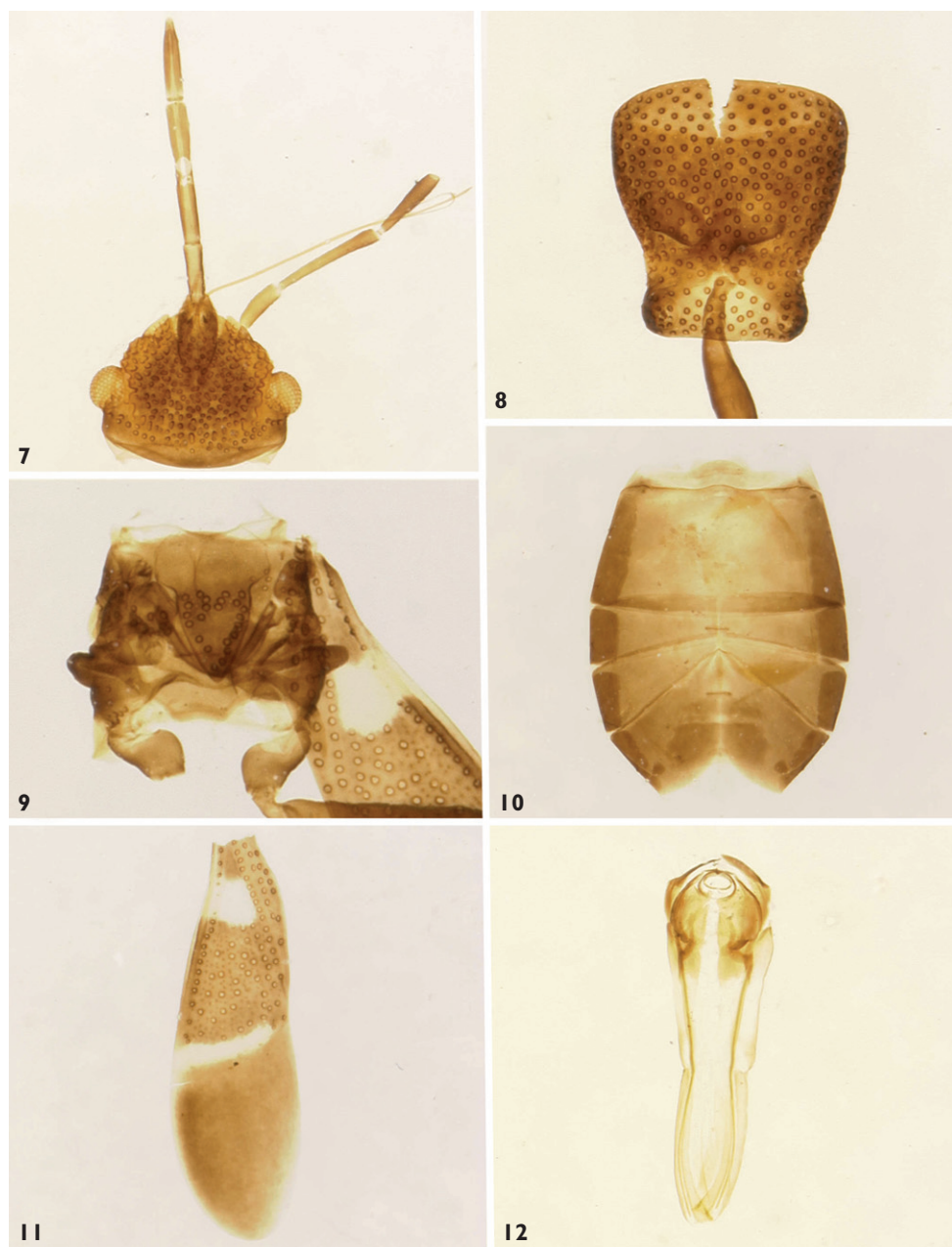
Description. Holotype male (Figs 1–4): Head, pronotum, scutellum, clavus, corium, pleura, sterna, abdomen, rostrum, antennae, and legs pale brown to brown. Antennal segments III and IV, and apex of II and rostral segment IV darker brown. Corium with a white subbasal macula and a narrow white band along posterior margin bordering membrane, whitish areas impunctate. Membrane fuscous with a narrow translucent margin.

Head, pronotum, and scutellum coarsely punctate. Head, pronotum, scutellum and narrowly explanate lateral margin of hemelytron and apex of corium shiny; remainder of corium and clavus dull. Antenna with short semierect setae, more abundant distally; segment I robust, segment IV fusiform. Anterior pronotal lobe globose, transverse impression separating lobe deep. Dorsum with numerous erect, pale setae, shorter and less abundant on hemelytra. Abdomen cylindrical.

Total length 2.50 mm, width across hemelytra 0.80 mm. Head length 0.40 mm, head width 0.61 mm, interocular space 0.42 mm. Labium extending to mesosternum, but not quite reaching mesocoxae; total length about 0.90 mm, length of segment I 0.19 mm, II 0.24 mm, III 0.24 mm, IV 0.18 mm. Antenna: Length of segments I 0.19 mm, II 0.35 mm, III 0.27 mm, and IV 0.42 mm. Pronotum: Length of anterior lobe 0.50 mm, length of posterior lobe 0.19 mm; anterior pronotal lobe 2.58 times longer than posterior pronotal lobe; width of anterior lobe 0.61 mm, width of transverse impression 0.45 mm, and width of posterior lobe 0.54 mm. Scutellum slightly longer than wide, depressed across middle, lacking a median carina. Membrane sclerotized,



Figures 1–6. 1–4 *Notocoderus argentinus*, holotype male 1 Dorsal aspect 2 Lateral aspect 3 Head and pronotum, lateral aspect (arrows indicate position of posterolateral pronotal tubercles) 4 Head and pronotum, dorsal aspect 5, 6 *Dycoderus picturatus* 5 Head and pronotum, lateral aspect (arrow indicates rounded posterolateral pronotal angle lacking a distinct tubercle) 6 Head and pronotum, dorsal aspect.



Figures 7–12. *Notocoderus argentinus*, paratype female (slide mounted) **7** Head **8** Pronotum **9** Thorax, including scutellum and ostiolar tuberculate tubercles **10** Abdomen **11** Hemelytron **12** Ovipositor.

without veins, exceeding apex of abdomen. Hemelytron length to apex of membrane 1.58 mm, length to apex of corium 0.99 mm.

Paratype female (slide mounted, Figs 7–12): Head, pronotum, and scutellum densely and deeply punctate; clavus and corium more sparsely punctate, except for im-

punctate white basal third and apex of corium. Hind wings apparently absent. Sterna II to IV fused; sterna V and VI with a pale sutural line medially. Laterotergites III and IV fused, suture lost. Terga membranous, tergite VI partially sclerotized medially; dorsal abdominal scent gland scar openings distinct between terga IV/V and V/VI.

Female: Head length 0.61 mm, width 0.72 mm, interocular space 0.48 mm. Labium: Length 1.01 mm, segment I 0.21 mm, II, 0.29 mm, III 0.22 mm, IV 0.29 mm. Antenna: Segment I length 0.18 mm, II 0.38 mm, III 0.26 mm, IV missing. Pronotum: Length 0.80 mm, width of anterior lobe 0.74 mm, width of transverse impression 0.46 mm, width of posterior lobe 0.50 mm; length of anterior lobe 0.56 mm, length of posterior lobe 0.24 mm. Hemelytron: Length to apex of corium 1.04 mm, length to apex of membrane 1.81 mm, width 0.50 mm (1.00 mm across hemelytra).

Etymology. The specific epithet *argentinus* is used to denote the country origin of this interesting new species.

Discussion. This species is distinct among the Oxycarenidae based on the shape of the bilobed pronotum (Figs 1, 4), with a well-developed tubercle at each posterolateral angle (Fig. 3), and the subbrachypterous hemelytra with four white maculae (Fig. 1), one on the basal third and apex of each corium.

The holotype and paratype were taken in pitfall traps set in two southern hilly areas of Buenos Aires Province, Sistema Serrano de Tandilia and Sistema Serrano de Ventania, respectively.

Type material. Holotype. Male. Argentina, Buenos Aires, Saavedra, Sierra Curamalal, 750 m, pitfall trap, H. Marrero coll. (MLP). Paratype female (slide mounted): Argentina, Buenos Aires, RN 226, Km 22.7, "El Abrojo" C1, 28-IX-2005, 3-II-2006, pitfall trap, J. L. Farina coll. (USNM).

Dycoderus Uhler

Dycoderus Uhler 1901: 507. Type species: *Dycoderus picturatus* Uhler, 1901. Monotypic.

Diagnosis. *Dycoderus* is distinguished by the coarsely punctate head, pronotum, and scutellum; the bilobed pronotum with lobes separated by a moderately shallow transverse impression, the weakly convex anterior lobe, and the shorter and slightly narrower posterior lobe; the brown hemelytron with the basal third and apex white; the moderately large ostiolar auricle extended up and outward into a tuberclelike spout; and the swollen fore femur, armed below with a large, stout spine on the distal third.

Description. Total length of subbrachypterous male 2.58 mm; length of macrop-terous male 3.14 mm; length of subbrachypterous female: 3.01 mm. Head, pronotum and scutellum coarsely punctate; hemelytral punctures finer and smaller. Dorsal surface with scattered, erect setae. Head globose; bucculae large and prominent occupying three fourths of the total length of ventral surface, extending posteriorly to about midlevel of eye, encompassing all of first rostral segment and basal half of second. Eyes small; ocelli tiny, reddish, set near inner margin of each eye. Pronotum bilobed, lobes separated by a

relatively shallow transverse impression, anterior lobe subquadrangular, weakly convex, slightly wider and about 1.7 times longer than posterior lobe. Scutellum subequalateral, with basal width slightly greater than length, basal half flattened, apex swollen above level of hemelytra. Hemelytron ranging from subbrachypterous (convex with a shell like membrane) to fully macropterous; corial margin narrowly explanate, with a row of shallow punctures along inner margin; membrane ranging from abbreviated, lacking veins, and extending only to apex of abdomen to fully developed with indistinct veins and extending beyond apex of abdomen by half its length. Proportionate length of corium to length of membrane 1.44. Ostiolar auricle elongate, extended upward and outward, forming a short, stout, tuberculate spout; evaporative area covering about half of metapleuron. Metacoxae widely separated. Fore femora moderately incrassate, armed below on distal third with a relatively large spine. Abdomen broad, abdominal sterna III to VI fused, posterior margin of sternites VII and VIII in males with two transverse combs of glandular setae on either side of median line.

Discussion. *Dycoderus* is similar to *Notocoderus*, but differs in the subequally wide pronotal lobes, with a more shallow transverse impression separating them, the lack of posterolateral tubercles on the posterior lobe, the shorter ostiolar tubercle (less visible from dorsal aspect), and the much larger white macula on the basal third of the corium.

Dycoderus picturatus Uhler

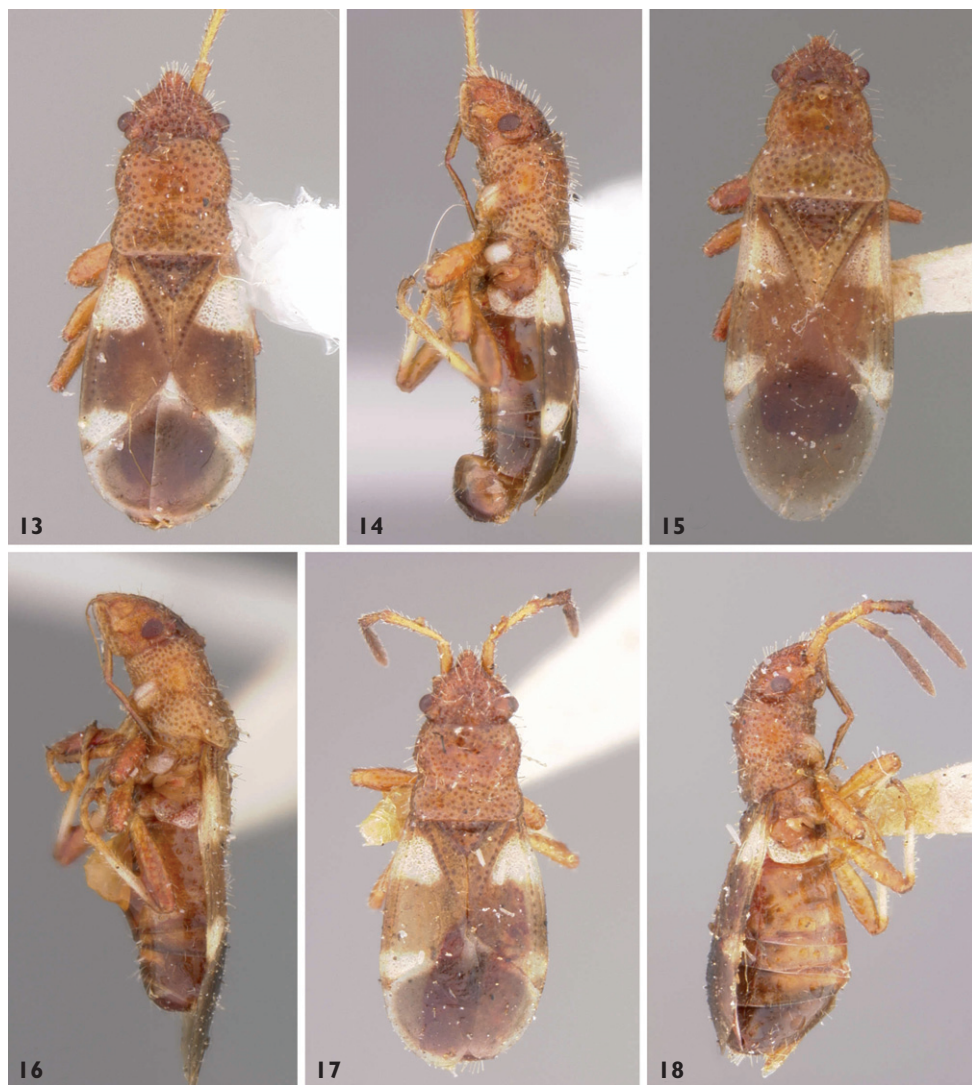
Figs 5, 6, 13–18

Dycoderus picturatus Uhler 1901: 508 (orig. descrip.); Slater 1964: 639 (cat.), 1974: 517 (note); Ashlock and A. Slater 1988: 209 (cat.).

Diagnosis. This species is best distinguished by the generic characters given above, especially the shape of the pronotum (Fig. 6) and the larger, white maculae (Figs 13, 15, 17) on the corium.

Description. Subbrachypterous lectotype male (Figs 13, 14): Overall coloration yellowish brown to almost reddish brown, with four white maculae on hemelytra. Dorsal surface of head, pronotum, scutellum, explanate costal margin, and wing membrane shiny; corium and clavus dull. Head reddish brown; eyes small, dark brown; ocelli tiny, indistinct, reddish. Labium yellowish brown, segment IV dark brown. Antenna yellowish brown, segment IV and apical half of III dark brown. Pronotum and scutellum reddish brown. Hemelytron largely brown to dark brown with basal third and apex white. Ventral surface brown to reddish brown, abdomen darker brown to fuscous laterally; acetabulae and posterior half of metapleuron white. Ostiolar evaporative area and auricle brown. Legs with femora brown to reddish brown; tibiae pale yellowish brown, slightly darker brown basally and distally.

Head deeply and densely punctate. Pronotum deeply but less densely punctate, posterolateral angles swollen but not tuberculate; scutellum deeply, but more sparsely punctate,



Figures 13–18. *Dycoderus picturatus* **13, 14** Subbrachypterous lectotype male **13** Dorsal aspect **14** Lateral aspect **15, 16** Macropterous male **15** Dorsal aspect **16** Lateral aspect **17, 18** Paralectotype female **17** Dorsal aspect **18** Lateral aspect.

depressed through middle, apex weakly swollen above level of hemelytra. Hemelytron impunctate except for a few fine punctures on white basal third of corium. Dorsum with scattered, erect, pale setae; setae more dense on head and pronotum than on hemelytron.

Total length 2.58 mm, width 0.99 mm. Head length 0.48 mm, width across eyes 0.62 mm; interocular width 0.42 mm, width between ocelli 0.32 mm. Labium: Total length 1.06 mm; segment I length 0.24 mm, II 0.26 mm, III 0.24 mm, IV 0.32 mm; extending to bases of middle coxae. Antenna: Segment I length 0.30 mm, II 0.45 mm, III 0.29 mm, IV 0.50 mm. Pronotum: Total length 0.69 mm, length of anterior lobe

0.43 mm, length of posterior lobe 0.25 mm, width of anterior lobe 0.66 mm, width of posterior lobe 0.70 mm, width of transverse impression 0.59 mm. Hemelytron length to apex of membrane 1.57 mm, length to apex of corium 1.20 mm.

Macropterous male (Figs 15, 16): Similar to subbrachypterous male but with wings fully developed and membrane extending well beyond apex of abdomen. Length 3.14 mm, width 1.07 mm. Head: Length 0.51 mm, width 0.62 mm, interocular width 0.40 mm; width between ocelli 0.32 mm. Labium: Total length 1.06 mm, length of segment I 0.27 mm, II 0.26 mm, III 0.21 mm, IV 0.32 mm, extending to bases of middle coxae. Antenna: Missing. Pronotum: Total length 0.77 mm, length of anterior lobe 0.42 mm, length of posterior lobe 0.35 mm, width of anterior lobe 0.69 mm, width of posterior lobe 0.91 mm, width of transverse impression 0.66 mm. Hemelytron length to apex of membrane 2.20 mm, length to apex of corium 1.40 mm.

Subbrachypterous paralectotype female (Figs 17, 18): Similar to subbrachypterous lectotype male in shape, size, and coloration. Length 3.01 mm, width 1.20 mm. Head: Length 0.45 mm, width across eyes 0.72 mm; interocular width 0.50 mm. Labium: Total length 1.10 mm, length of segment I 0.27 mm, II 0.32 mm, III 0.26 mm, IV 0.35 mm; extending to bases of middle coxae. Antenna: Length of segment I 0.26, II 0.40 mm, III 0.27 mm, IV 0.46 mm. Pronotum length 0.72 mm, length of anterior lobe 0.46 mm, width of anterior lobe 0.75 mm, length of posterior lobe 0.26 mm, width of posterior lobe 0.82 mm. Hemelytron length to apex of membrane 1.89 mm, length to apex of corium 1.33 mm.

Distribution. Reported and known only from Arizona and Colorado in the United States (Ashlock and A. Slater 1988).

Discussion. This species is most similar to *Notocoderus argentinus* in overall appearance, but can be distinguished by the presence of ocelli, the subequally wide pronotal lobes, the lack of a tubercle on each posterolateral angle of the posterior lobe, and the larger white maculae on the corium.

Type material examined. Lectotype. Male. (here designated to preserve nomenclatural stability): label 1, “Phoenix, Ariz, 5.97”; label 2, “Type”; label 3, “Remounted 1 Feb. 2008” (USNM). **Paralectotypes:** 1 female, same data as for lectotype (USNM); 1 female [head, pronotum, right hemelytron, and all legs missing], “Col.,” “*Dycoderus picturatus* Uhler” (in Uhler’s hand), “P. R. Uhler collection.,” “*Dycoderus picturatus* Uhl. Lectotype(?)”, Det. H. G. Barber” (USNM).

Other specimens examined. 1 female, West Cliff, Colo.[?City]; *Dycoderus picturatus* Uhler det. H. G. Barber (USNM); 1 male, Garland, Col., 22 – 6, Hubbard & Schwarz (USNM); 2 females, Custer Co., Col., Aug., T. D. A. Cockerell (USNM).

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References

- Ashlock PD, Slater A (1988) Family Lygaeidae Schilling, 1829 (= Infericornes Amyot and Serville, 1843; Myodochidae Kirkaldy, 1899; Geocoridae Kirkaldy, 1902). Pp. 167–245. In: Henry TJ, Froeschner RC (Eds) Heteroptera, or true bugs, of Canada and the continental United States. E. J. Brill, Leiden and New York, 958 pp.
- Breddin G (1902) Die Hemipteren und Siphunculaten des arktischen Gebietes. Fauna Arctica, Jena 2: 531–560.
- Curtis J (1835) Insects. Descriptions of the insects brought home by Commander James Clark Ross, R. N., F. R. S., & C. In: Ross JC (Ed.) Appendix to the narrative of a second voyage in search of a north-west passage and of a residence in arctic regions during the years 1829, 1830, 1831, 1832, 1833. A. W. Webster, London, lvii–lxxx.
- Dellapé PM, Cheli GH (2007) A new species of *Anomaloptera* Amyot & Serville from Patagonia (Hemiptera: Lygaeoidea: Oxycarenidae). Zootaxa 1528: 65–68.
- Henry TJ (1997) Phylogenetic analysis of family groups within the infraorder Pentatomomorpha (Hemiptera: Heteroptera), with emphasis on the Lygaeoidea. Annals of the Entomological Society of America 90(3): 275–301.
- Hoberlandt L (1987) Results of the Czechoslovak-Iranian Entomological Expeditions to Iran 1970, 1973 and 1977. Heteroptera, Lygaeidae, Oxycareninae. Acta Entomologica Musei Nationalis Pragae 42: 12–29.
- Péricart J (2001) Family Lygaeidae Schilling, 1829 – seed-bugs. In: Aukema B, Rieger C (Eds) Catalogue of the Heteroptera of the Palaearctic Region. Pentatomomorpha I. Volume 4. The Netherlands Entomological Society, Amsterdam, 35–220.
- Slater JA (1964) A catalogue of the Lygaeidae of the world. 2 volumes. University of Connecticut, Storrs. 1668 pp.
- Slater JA (1974) *Neaplax*, a new genus of Oxycareninae from the Western Hemisphere (Hemiptera: Lygaeidae). Journal of the Kansas Entomological Society 47(4): 517–522.
- Slater JA, Baranowski RM (1994) The occurrence of *Oxycarenus hyalinipennis* (Costa) (Hemiptera: Lygaeidae) in the West Indies and new Lygaeidae records for the Turks and Caicos Islands of Providenciales and North Caicos. Florida Entomologist 77: 495–497.
- Slater JA, O'Donnell JE (1995) A catalogue of the Lygaeidae of the world (1960–1994). New York Entomological Society, New York, 410 pp.
- Uhler PR (1901) Some new genera and species of North American Hemiptera. Proceedings of the Entomological Society of Washington 4: 507–515.