



TIGER BEETLES OF ANGOLA: A NEW SPECIES OF THE GENUS *DROMICA* DEJEAN, 1826 AND NEW DATA ON OTHER SPECIES (COLEOPTERA: CICINDELIDAE)

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Abstract: One new species of the tiger beetle genus *Dromica* Dejean, 1826 is described from southeastern Angola (Bié Province). The work provides diagnostic characters and in particular, the structure of male genitalia. Affinities to putative relatives within the *D. erikssoni* species Group are given. *Dromica pentheri* W. Horn, 1899 is recorded for the first time to Angola and an annotated list of other species of Dromicina sampled in this country is provided also.

Key words: *Dromica*, new species, “*erikssoni* group”, Dromicina, Angola.

ESCARAVELHOS-TIGRE DE ANGOLA: UMA NOVA ESPÉCIE DO GÊNERO *DROMICA* DEJEAN, 1826 E NOVOS DADOS SOBRE OUTRAS ESPÉCIES (COLEOPTERA: CICINDELIDAE)

Resumo: Descreve-se uma espécie nova do género *Dromica* Dejean, 1826 capturada no sudeste de Angola (Província do Bié). São facultados caracteres de diagnóstico nomeadamente a estrutura da genitália. As afinidades com as espécies mais próximas do “grupo *erikssoni*” são discutidas. *Dromica pentheri* W. Horn, 1899 é registada pela primeira vez para Angola e uma lista comentada de outras espécies de Dromicina amostradas neste país é ainda facultada neste trabalho.

Palavras-chave: *Dromica*, espécie nova, “*erikssoni* group”, Dromicina, Angola.



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INTRODUCTION

A historical review of the Afrotropical genus *Dromica* Dejean, 1826 (Coleoptera, Cicindelidae) and a synthesis of its knowledge was carried out by CASSOLA (2002). Taking into account the nomenclature given by CASSOLA (*op. cit.*) there are a total of 11 species and subspecies in this genus known from Angola (SERRANO & CAPELA, 2013). The genus (*s. str.*) is very speciose (about one hundred and fifty species) and was split in several Groups, one of them the *erikssoni* Group. This Group seems controversial as apparently it involves distinct species (CASSOLA, 2002). Some of these Groups have been reviewed by SCHÜLE (e.g., 2004, 2007, 2011). Nineteen species of the *erikssoni* Group were described until now from southwestern as well as south-central countries of Africa (Angola, Namibia, Democratic Republic of Congo, Zambia, Zimbabwe, Uganda) (CASSOLA, 2002; SCHÜLE, 2003). Seven species within this Group were described exclusively from Angola, but *Dromica lunai* Basilewsky was recorded posteriorly for Katanga and *Dromica tricotulata* W. Horn for Namibia and Zambia (see SERRANO & CAPELA, *op. cit.*). The external morphologic characterization of the *erikssoni* species Group, including the aedeagus, can be achieved in CASSOLA (2002).

The aim of this work is to describe one new species of the genus *Dromica* for Angola. We provide notes about relationships of this species with the closest forms. Moreover a new species record for Angola is presented and new data on other Dromicina species is given also.

MATERIAL AND METHODS

Adults of tiger beetles were collected in Kwanza Sul, Huambo and Bié Provinces of Angola during the beginning of the rainy season (30.X–6.XI.2014) by means of direct observation (abbreviation “DO” in the text).

The study of the specimens collected resulted in the identification of seven species of Dromicina, one of them representing a new species of *Dromica*. We follow the classification of Cassola (2002) for *Dromica* (*s.l.*) genus. Within each genus the species/subspecies names are organized by alphabetical order.

The morphological study of adult specimens, including measurements of the new species, was performed with a Wild M5 stereoscopic microscope equipped with a dissecting microscope ocular micrometer. The photographs of adult specimens were taken with a Nikon D300S equipped with an objective EX Sigma 105mm 1:2.8 DG MACRO and with Nikon flashes wireless remote speedlight SB-R200. The measurements done were body length (posterior margin of labrum to apex of elytron, excluding the apical spine), labrum length (measured from anterior to basal margin along midline), labrum width (between the widest region of the lateral margins), head length (posterior margin of labrum to anterior margin of pronotum), head width (between the lateral region of eyes), pronotum length (measured from anterior to basal margins along midline), pronotum width (between the widest region of the lateral margins, excluding the proepipleura), elytron length (basal margin near scutellum to apex of the longer elytron, without apical spine) and elytron width (measured across both elytra at their widest point).

The distribution in Angola of all species herein recorded is given in geographic coordinates. Moreover, the number of the correspondent aero-photogrammetric

survey maps of Angola [scale 1:100 000, edited by the JUNTA DE INVESTIGAÇÕES DO ULTRAMAR & GOVERNO GERAL DE ANGOLA (1948-1963)] is provided for each locality (see Fig. 1 in SERRANO & CAPELA, 2013). The acronym used for the entomological collection where the type material and the material here examined were placed is as follows:

ASC = Artur Serrano Collection, Portugal

RESULTS

Dromica fredericoi n. sp.

(Figs 1, 2, 3, 4, 5, 6, 7)

Type series. Holotype. ♂; Angola (Bié Province), Catota (coord.:14° 00' 37.17'' S, 17° 24' 00.33'' E, 1532 m alt., 323), 3.XI.2014, A. Serrano leg. Allotypus ♀ and 1 Paratype ♂, same locality and date, DO, A. Serrano leg. Holotype and paratypes deposited in the collection of the first author (ASC).

Derivatio nominis. This magnificent species is dedicated in a modest homage to the father of first author, Frederico de Vilhena Moniz Serrano, a lover of wildlife, who died in a tragic plane crash in southern Angola.

Diagnosis. *Dromica fredericoi* n. sp. by its morphological characters belongs to the *erikssoni* Group. Small to medium size, dark with strong purpurish reflections in elytra. Labrum of the male testaceous, with a basal subrectangular black patch in the middle (Fig. 4), labrum of the female wholly black (Fig. 5). Frons with 3–5 setae above antennal base. Elytra with a continuous testaceous submarginal band from the shoulders to the apical angle, faraway a little from the side edge, protruding on disk past the middle with a descending slightly arcuate ramus, overcoming the centre of the elytron (Figs 1, 2). Antennomeres 5–9 strongly foliated. Aedeagus as in figure 3.

Description. Length of holotype: 14.2 mm. Length of Allotypus (female): 16.5 mm, length of paratype (male): 14.4 mm.

Head (Fig. 1). Wider than long [length: 2.66–2.72 mm (males), 3.30 mm (female), width 3.46–3.49 mm (males) and 4.22 mm (female)], eyes slightly prominent; flattened above between the eyes, slightly elevated in vertex (male), stronger in female; fully glabrous except for 3 sensorial setae or setigerous punctures near inner margin of eyes; frons with 3–5 setae above antennal base; sculpture consisting of strong ridges, irregularly wavy in the middle, well visible longitudinal near the eyes, closer wavy transverse striae on vertex, oblique, finally transverse behind eyes on neck. Clypeus almost fully smooth, top of forehead and frons with strong longitudinal striae; genae glabrous, finely and longitudinally striated. Colour shiny black, some golden reflections at dorsal sides near and behind the eyes, with some violet and greenish metallic hue at sides of clypeus, on antennal plates, and behind eyes on sides of neck. Labrum slightly transverse, wider than long [length: 1.38–1.50 mm (males), 1.98 mm (female), width 1.79–1.82 mm (males) and 2.21 mm (female)] glabrous, testaceous in male, with a basal subrectangular black patch in the middle (Fig. 4) and wholly black in female (Fig. 5), with four submarginal setae, two deep incisions on sides of middle front margin, the three middle teeth distinctly produced downwards, the lateral ones outwards in female, the intermediate almost absent or slight produced in males, stronger in female. Mandibles shiny black, slightly yellowish testaceous on basal outer edges (Figs 4, 5). Maxillary and labial palpi testaceous with the last palpomere metallic dark

in the second half (males) or the last two palpomeres entirely metallic dark (female); penultimate labial palpomere follows the *Dromica* species conformation pattern. Antennae extending approximately to anterior third of elytral length, longer in males; scape and antennomers 2–4 black, with bluish-greenish or violet metallic reflections, a row of 7–8 setae (males), 2–3 setae (female) dorsally and 2–3 erect setae on tip of scape, a few spiniform setae on 3rd and 4th antennomers; antennomers 5–11 dull black, finely and evenly pubescent, the 5 to 8 strongly thickened, stronger flattened and foliated in female than in males, the 9–11 progressively narrowing towards the apex.

Thorax. Pronotum (Figs 6, 7) slightly longer than wide (1.2–1.3 times) [length: 2.72–2.82 mm (males) and 3.17 mm (female); width: 2.21–2.37 mm (males) and 2.66 mm (female)], trapezoid-shaped, with the anterior margin slightly larger [width: 2.27–2.34 mm (males) and 2.72 mm (female)] than the posterior one [width: 2.02–2.05 mm (males) and 2.27 mm (female)]; lateral margins of middle lobe slightly convergent since the anterior transversal constriction to the posterior one, sculpture with rather strong ridges, transversal, parallel and slightly wavy in the middle, a little stronger laterally; sculpture of front lobe as middle lobe; sculpture of hind lobe coarser, wavy, more irregular. Epipleural rim conspicuous all along the sides of middle lobe, with proepisterna briefly visible from above. Surface fully glabrous, colour shiny black, lateral region of the disc with golden cuprous reflections, following the same pattern reflection of the head, some slight violet reflections in the lateral rim; proepisterna shiny black, smooth, slightly striated near the epipleural suture only; coupling sulci strongly funnel-shaped, deep close to the beginning of the epipleurae of elytra, ending in a shallow groove in the middle of mesepisternum.

Elytra longer than wide (1.8–2.1 times) [(length: 8.65–8.78 mm (males) and 9.98 mm (female); width: 4.16 mm (males) and 5.54 mm (female)], oval-shaped, elongated (males) (Fig. 1), more convex and enlarged (female) (Fig. 2), with almost no shoulders; apical edge with a strong sutural spina (males) (Fig. 1) or a small tooth (female) (Fig. 2); glabrous, except for a few erect light hairs on shoulders, here and there along the first longitudinal costae and along the outer margin of the submarginal yellowish band. Colour strongly metallic purpurish on disc between the first costae and the yellowish submarginal band, suture and first row of pitted foveoles with golden metallic colour, becoming less noticeable towards the apex, some bluish-green or violet hue along the lateral margins. Sculpture consisting of many deep and large (width: ~ 0.20–0.40 mm) polygonal (pentagonal or hexagonal) alveoli, contiguous, evenly distributed, forming irregular longitudinal rows in the first elytral half between the suture and the yellowish submarginal band; alveoli of parasutural row transverse, almost rectangular shaped, separated by slight wavy walls; many roundish small alveoli occur in the yellowish elytral band and in the blackish marginal area along each elytron; suture non (males) or only very slightly protruding in relief in its uppermost region (female); three longitudinal costae on each elytron more visible in latero-dorsal view, parallel to but at some distance from the suture, the first costae ending approximately at the two thirds of the elytral length, the second ending just before the first costae, near the yellow ramus band, and the third less apparent, beginning approximately in the second elytral half after the beginning of the second costae and crossing the yellow ramus band. Elytral markings (Figs 1, 2) forming a conspicuous, uninterrupted, yellowish submarginal band, since the shoulders until the apex, which becomes wider and closer to the elytral margin in its apical third; internally on disc, overcoming the centre of the elytron, such a band is prolonged with a descending slightly arcuate ramus, reaching the first costae. Epipleura smooth, shiny bluish-black.

Underside. Black, with bluish-violaceous metallic reflections; none recumbent or erect setae on pro- meso- and metasterna. Pro- meso- and metacoxae densely bristled anteriorly, ventral hind margin of metacoxae densely bristled also. Abdominal sternites smooth, black with some metallic bluish violet hue near the margins, fully glabrous, except two setae near the hind margins of sternites 4–6. Trochanters pitchy black, glabrous, except protochanters with one subapical seta; femora dark black with some violet or greenish metallic reflections, a few rows of sparse white erect setae; tibiae and tarsi reddish testaceous, the former tinged with some metallic green distally, the later fully tinged, with some rows of shorter, dark, spiniform setae.

Aedeagus (Fig. 3). Male genitalia conformation follows the pattern of the *erikssoni* Group (CASSOLA, 2002). Median lobe tapered, fusiform, narrowed and strongly hooked apically.



Figure 1 – Facies of the male of *Dromica fredericoi* n.sp. Scale: 3 mm.



Figure 2 – Facies of the female of *Dromica fredericoi* n.sp. Scale: 3mm.



Figure 3 – Aedeagus of *Dromica fredericoi* n.sp. (lateral view). Scale: 1 mm.



Figure 4 – *Dromica fredericoi* n. sp.: head, mandibles and labrum, male (dorsal view). Scale: 0.5 mm.



Figure 5 – *Dromica fredericoi* n. sp.: head, mandibles and labrum, female (dorsal view). Scale: 0.5 mm.



Figure 6 – *Dromica fredericoi* n. sp.: pronotum, male (dorsal view). Scale: 0.5 mm.



Figure 7 – *Dromica fredericoi* n. sp.: pronotum, female (dorsal view). Scale: 0.5 mm.

Remarks

Habitat. The specimens were collected in an abandoned countryside road through a secondary open forest, with some litter over the sand-clayish soil (Fig. 11). A couple was captured during mating behaviour. Further adult specimens of other tiger beetle species were collected in the same road namely *Dromica pentheri* W. Horn, *Dromica serietuberculata* f. *lundana* Basilewsky, *Trichotaenia* sp. n. (Serrano & Capela, in prep.), *Prothymidia angusticollis* (Boheman), *Lophyra* (*Stenolophyra*) *uncivittata* (Quedenfeldt) and *Cylindera* (*Ifasina*) sp.

Affinities. The tiger beetle fauna of Angola is poorly known and represented until now by 21 species/subspecies of the genus *Dromica* (s.l.) (SERRANO & CAPELA, 2013). Some more species of this genus from Angola are under description (P. Schüle, pers. comm.). The new species belongs to the *erikssoni* Group (*sensu* CASSOLA, 2002). It is well differentiated from all the species within this group, among other features, by the strong elytral disc sculpture and the shape of the elytral markings also, which faintly resembles in this aspect *Dromica kavanaughi* Cassola. However, it differs from this species by the presence of longitudinal costae (absent in *D. kavanaughi*), among other features. Within the representatives of this group with one to three longitudinal costae and taking into account the analysed characters *D. fredericoi* n. sp. seems closer to *Dromica lunai* Basilewsky, a species well characterized by BASILEWSKY (1965), and *Dromica tricastulata* W. Horn. For instance, the former species present the alveoli of first row close to the suture transverse, almost rectangular shaped, separated by slight wavy walls. However, more than a different shape of elytral markings, both species differ by the number of elytral costae (three in *D. fredericoi* n. sp. vs. two in *D. lunai*), by the pronotum not so long and the clypeus not so onward into the base of labrum in the new species. In what concerns *D. tricastulata*, more than a different shape of elytral markings also, the new species is more robust, presenting an elytral sculpture with the alveoli deeper and larger and the longitudinal costae less evident. The new species, by the prolonged ramus of the submarginal band internally on disc, is slightly akin also with *Dromica mesothoracica* W. Horn and *Dromica zambiensis* Cassola, but these species are easily segregated by the absence of elytral costae and by the presence of a prominent sutural rim. *Dromica fredericoi* n. sp. is related with *Dromica cassolai* Schüle by bearing several setae on frons, but is easily segregated from this species by the presence of elytral costae, among other features.

List of Dromicina

Dromica pentheri W. Horn, 1899

Material examined: Angola, Bié Province, Satchijamba (coord: 13° 44' 52.24'' S, 17° 09' 40.35'' E, 1540 m alt., 283), 2.XI.2014, 1♂, 1♀, DO, A. Serrano & R. Capela leg.; Catota (coord: 14° 00' 37.17'' S, 17° 24' 00.33'' E, 1532 m alt., 303), 2.XI.2014, 1♀, DO, A. Serrano leg., ASC.

Remarks. A species (Figs 8, 9) well characterized by the presence of white setae on pro- and mesosterna and known from Namibia and Zimbabwe (CASSOLA, 2002), but found also in Zambia (P. Schüle, pers. comm.). It is a new record to Angola. We found the adults in the first location on sandy soil of a hillside covered within patches of thorny herbaceous plants (Fig. 10). No other tiger beetles were present in this site. In Catota we found close to this species individuals of *D. fredericoi* n. sp. and *P. angusticollis*.



Figure 8 – Facies of the male of *Dromica pentheri*. Scale: 3 mm.



Figure 9 – Facies of the female of *Dromica pentheri*. Scale: 3 mm.



Figure 10 – Habitat of *Dromica pentheri*: Satchijamba, Bié, Angola.

***Dromica serietuberculata* W. Horn, 1929 f. *lundana* Basilewsky, 1965**

Material examined: Angola, Bié Province, Catota (coord: 14° 00'37.17'' S, 17° 24'00.33'' E, 1532 m alt., 303), 2.XI.2014, 2♂♂, 2♀♀, DO, A. Serrano leg.; 3.XI.2014, 3♂♂, 1♀, DO, A. Serrano leg., ASC.

Remarks. A form described from Angola, but found also in Zambia (P. Schüle, pers. comm.). The nominal form was not found until now in Angola. The adults (Fig. 12) were found hunting in the litter which covered the abandoned countryside road also (Fig. 11) and, either morphologically, either behaviourally, resemble very much to a species of Formicidae (not identified), both running quickly and hiding under the leaf litter when disturbed. Further adult specimens of tiger beetles were collected in the same habitat namely *D. pentheri*, *Trichotaenia* sp. n., *P. angusticollis*, *L. (Stenolophyra) uncivittata* and *C. (Ifasina)* sp.

***Dromica similis* Cassola, 1980**

Material examined: Angola, Bié Province, Cachingue-Chipica (coord: 13° 10' 15.74'' S, 16° 45' 48.17'' E, 1649 m alt., 281), 1.XI.2014, 1♂, DO, A. Serrano leg., ASC.

Remarks. An Angolan tiger beetle endemic species. We addressed with some reserves this specimen to this species. It seems that the species, as happens with some other *Dromica* species, may present morphological fluctuations concerning the labrum colour, the shape of the antennomers, the elytral yellowish markings and the number of longitudinal costae (P. Schüle, pers. comm.). Our specimen presents an aedeagus shape similar to the one presented by CASSOLA (1980, 2002), but a different pronotum conformation (less trapezoid with lateral margins slightly arcuate). The adult was found beneath herbaceous plants in the edges of a countryside road and is syntopic with other tiger beetle species such as *P. angusticollis*, *Trichodela nubifera* (Quedenfeldt), *Lophyra (Stenolophyra) infuscatula* (W. Horn) and *Lophyra (Stenolophyra) saraliensis* (Guérin-Méneville).

***Foveodromica juengeri* (Cassola, 1985)**

Material examined: Angola, Kwanza Sul Province, Calulo–Cabuta (coord.: 9° 54' 48.55'' S, 14° 54' 31.35'' E, 812 m alt., 128), 5.XI.2014, 1♂, DO, R. Capela leg., ASC.

Remarks. An endemic tiger beetle species of Angola from which there are some records around the type locality of Calulo (SERRANO & CAPELA, 2013). The adult was captured under the litter in the edges of the countryside road through arable fields between Calulo and Cabuta localities.

***Foveodromica strandi* (W. Horn, 1913)**

Material examined: Angola, Huambo Province, Cruzeiro (coord.: 12° 46' 41.74'' S, 15° 54' 09.49'' E, 1743 m alt., 232), 4.XI.2014, 1♀, DO, A. Serrano leg., ASC.

Remarks. A tiger beetle species known only from Angola and Republic Popular of Congo (CASSOLA, 2002). The adult was captured under the litter in a very small patch of wooded trees (Fig. 13) close to a countryside road and is syntopic with *Lophyra (Bothrylophyra) wellmani* (W. Horn).

***Foveodromica* sp. n.**

Material examined: Angola, Kwanza Sul Province, Calulo–Cabuta (coord.: 9° 53' 59.88'' S, 14° 54' 27.36'' E, 831 m alt., 128), 5.XI.2014, 1♂, 1♀, DO, A. Serrano leg., ASC.

Remarks. As was pointed out in SERRANO & CAPELA (2013) this is a new tiger beetle endemism of Angola under description (P. Schüle, pers. comm.). The adults were sampled in copula in a countryside road through primary forest (Fig. 14).



Figure 11 – Habitat of *Dromica fredericoi* n. sp., *Dromica pentheri*, *Dromica serietuberculata* and *Prothymidia angusticollis*: Catota, Bié, Angola.



Figure 12 – *Dromica serietuberculata* f. *lundana*: Catota, Bié, Angola.



Figure 13 – Habitat of *Dromica strandi* and *Lophyra wellmani*: Cruzeiro, Huambo, Angola.

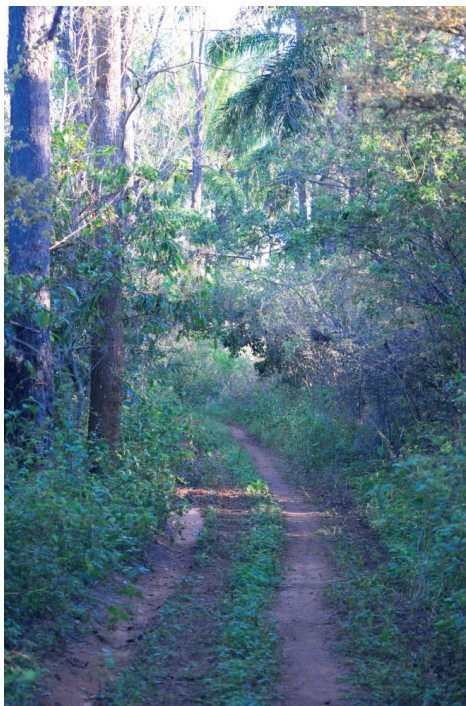


Figure 14 – Habitat of *Foveodromica* n. sp.: Calulo – Cubata, Kwanza Sul, Angola.

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