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A new species of *Tetraopes* Dalman (Coleoptera, Cerambycidae) from the seasonally dry tropical forest of Yucatán, Mexico

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A new species of *Tetraopes* Dalman, 1817 (Lamiinae: Tetraopini) is described and illustrated. The specimens were found associated with an asclepiad vine in a remnant patch of disturbed seasonally dry tropical forest from Mérida, Yucatán, Mexico. Photos of dorsal, ventral, lateral, and frontal habitus of holotype and allotype, as well as dorsal habitus from most paratypes, are included. Photos of leaves, flower, and fruit of the host plant, *Dictyanthus yucatanensis* Standl., are also included.

Key words: *Dictyanthus*, Endemic, Longhorn beetles, Plant-insect association, Lamiinae, Neotropics

Tetraopes Dalman, 1817 is a small genus with 26 species distributed from Canada to Costa Rica. Only *T. paracomes* Chemsak, 1963 is known to be restricted to Guatemala and Costa Rica, while the other 25 species are mainly distributed in the USA and Mexico. Only *T. annulatus* LeConte, 1847, *T. femoratus* LeConte, 1847, *T. melanurus* (Schoenherr, 1817), *T. quinquemaculatus* Haldeman, 1847, and *T. tetrophthalmus* (Forster, 1771) reach Canada to the north, whereas *T. comes* Bates, 1881, *T. discoideus* LeConte, 1858, *T. thermophilus* Chevrolat, 1861, and *T. umbonatus* LeConte, 1852 extend their distribution to Central America to the south (Bezark 2023; Monné 2023; Monné & Nearns 2023). All species are known to be associated with *Asclepias* spp. or asclepiad vines (Apocynaceae, Asclepiadoideae), or in a minor degree to other species of Apocynaceae, Fabaceae, and Pedaliaceae (Farrell & Mitter 1998; Monné 2023; Monné & Nearns 2023).

Chemsak (1963) produced the most recent taxonomic treatment of the genus. Thirty-two years later, Linsley & Chemsak (1995) updated the knowledge but only for the species of *Tetraopes* from the USA and Canada. Since then, only one species was described from the USA, *T. skillmani* Chemsak & Noguera, 2004, a species currently also known from Mexico (Tamaulipas). From Mexico to Central America, the species of *Tetraopes* have not received any further taxonomic study. However, since the revision of Chemsak (1963), three other new species were described from Mexico (Chemsak & Giesbert 1986; Chemsak & Noguera 2004). Therefore, Mexico harbors the highest diversity of *Tetraopes*, 16 species (Pérez-Flores *et al*. 2021; Monné 2023). The Yucatán Peninsula (comprising the Mexican states of Campeche, Quintana Roo, and Yucatán) is one of the few regions of Mexico with no previous records of *Tetraopes*. Nonetheless, Monné (2023) reports four species of another Tetraopini genus, *Phaea* Newman, 1840 in Quintana Roo (*P. acromela* Pascoe, 1858 and *P. miniata* Pascoe, 1858) and Yucatán (*P. nigromaculata* Bates, 1881 and *P. tricolor* Bates, 1881).

Little is known about the association of *Tetraopes* to asclepiad vines. Farrell & Mitter (1998) cited only two species that have been collected so far in this type of plant, *T. ineditus* Chemsak & Giesbert, 1986 in *Marsdenia lanata* (Paul G. Wilson) W.D. Stevens (Marsdenieae) and *T. paracomes* Chemsak, 1963 in *Matelea quirosii* (Standl.) Woodson (Asclepiadeae). The latter, a plant included within subtribe Gonolobinae, is closely related to the most common host plants (*Asclepias* spp.: Asclepiadinae) of *Tetraopes*. In the present work, we describe and illustrate a new species of *Tetraopes* from the seasonally dry tropical forests of Yucatán. This taxon is the third species to be known associated with an asclepiad vine and the first record of the genus in this region of Mexico.

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Material and methods

All specimens of the new species were collected by hand while on frequent diurnal transects to visually and photographically survey the entomological fauna of a remnant patch of disturbed lowland seasonally dry tropical forest within the sprawling suburbs of the city of Mérida, Mexico. These specimens were dry mounted and incorporated into the "Colección Entomológica Regional of Universidad Autónoma de Yucatán" (CER-UADY, Mérida, Mexico) and private collection of the first author (LP, Mérida, Mexico). The first author examined and measured the specimens with a 10X handheld loupe and a simple rule. Photographs of all specimens were taken with a Canon EOS Rebel T100 digital camera. We reviewed descriptions of all species of *Tetraopes* to be certain that the species described here was not already known. The terminology of these published works, Lawrence *et al.* (2010), and Švácha and Lawrence (2014) served as the basis for the description of the new species here proposed. We identified the flowering host plant using our personal knowledge on botany and the local flora, and the synopsis of Stevens (1988) on *Dictyanthus* Decne. We added collection codes in the labels (LPccer4 to LPccer11) for referring to each individual type specimen.

Results

Tetraopini

Tetraopes paradisi Peraza, sp. nov.

(Fig. 1A–M)

Diagnosis. Pronotum black, without maculae, covered with short yellowish-gray appressed pubescence, and dense, long, erect black setae; anterior impression wide and shallow, posterior impression wide and deep; umbone moderately elevated, slightly convex, almost flat on top, sides unpunctate and glabrous, central area with dense, long, erect black setae, with shorter setae interspersed, separated from basal impression by a shallow sulcus. Each elytron with large, subrounded black macula on middle of anterior two-thirds; posterior third black, with its anterior margin straight or projected toward anterior region along suture, and may or may not reach the anterior black macula. Female with ventrite 5 not depressed.

Holotype male. Form moderate-sized, slightly robust, length from clypeal apex to pygidium apex, 9.5 mm; width across humeri, 3.0 mm; integument with dense, appressed yellowish-gray pubescence and moderately sparse, long, erect, black setae. **Coloration**. Body black, with elytra mostly red, mandibles and labrum dark brown. **Head** slightly narrower than pronotum; pubescence slightly denser on genae, frons, and clypeus. Vertex with slightly dense and moderately coarse punctures. Frons transverse, three times wider than lower eye lobe, slightly convex; genae subquadrate, length subequal to lower eye lobe; maxillary palpi with apical segments slightly enlarged, narrowly ovoid; mandibles with basal half strongly excavated, apical half glabrous, moderately arcuate; labrum densely fringed with both short and long erect golden setae; eyes moderately large, very finely faceted, upper lobes slightly closer to each other than lower lobes; antennae shorter than body, all segments with fairly denser and slightly thicker yellowish-gray pubescence beneath; from scape to third segment with fairly dense, moderately coarse punctures, with long, suberect black setae; from fourth to tenth segment with a fringe of long, erect, black setae directed downward and inward; third segment shorter than scape; fourth shorter than third; fifth subequal to fourth; sixth shorter than fifth; sixth subequal to seventh; segments eighth to tenth gradually diminishing in length; eleventh longer than tenth and subacute apically. **Pronotum** wider than long; sides slightly rounded; densely, coarsely punctate; with long erect setae sparser than on umbone; anterior impression wide, shallow, posterior impression broad, deep; posterior margin with fringe of dense, very long, erect black setae (sparser and shorter toward sides); umbone large, slightly convex, moderately elevated, sides delimited, glabrous, central area coarsely, contiguously punctate, with dense, both long and short erect black setae, lacking pubescence, sides without maculae, delimited posteriorly by a fairly shallow sulcus between umbone and basal impression. **Prosternum** narrow, shallowly impressed, micropunctate; prosternal process very narrow. **Meso- and metaventrite** micropunctate; metepisterna moderately elevated on middle. **Scutellum** widely rounded apically, slightly transverse, micropunctate, covered with dense, short, erect black setae. **Elytra** about twice as long as wide, parallel-sided; subaligned punctate, punctures on basal half moderately dense, slightly coarser, becoming finer, shallower and sparser toward apex from middle; erect setae longer on circum-scutellar region and gradually decreasing in size and density outward; humeri with a dark macula; basal half with a large black macula on each elytron, almost reaching suture, macula densely clothed with short, erect, black setae; apical third black, anterior margin of black region expanding suturally towards large maculae (reaching and partially surrounding them), without maculae; apices rounded. **Legs** short, stout, micropunctate; apical half of mesotibiae with brush of short black setae dorsally; apical fifth of metatibiae with shorter and sparser bristly black setae dorsally. **Abdomen** densely micropunctate, with sparse, long, suberect yellowish-gray setae, and slightly dense, long, erect black setae on sides; ventrite 5 broadly rounded apically.

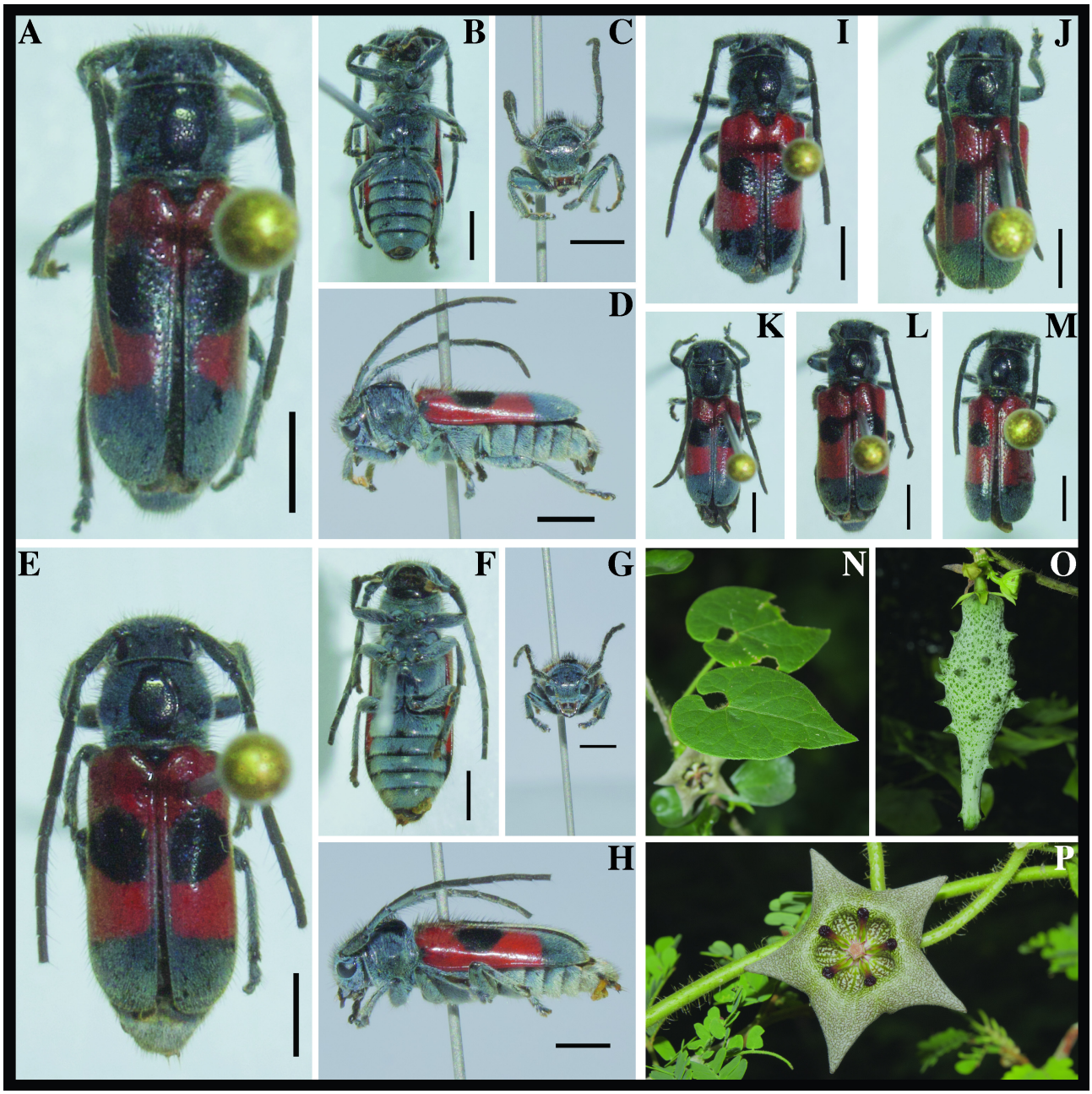

FIGURE 1. A–M) Types of *Tetraopes paradisi* **sp. nov**. A–D) Holotype male [LPccer5]: A) Dorsal habitus; B) Ventral habitus; C) Frontal habitus; D) Lateral habitus. E–H) Allotype female [LPccer4]: E) Dorsal habitus; F) Ventral habitus; G) Frontal habitus; H) Lateral habitus. I–M) Paratypes male, dorsal habitus: I) LPccer8; J) LPccer9; K) LPccer7; L) LPccer6; M) LPccer10. N–P) Host plant, *Dictyanthus yucatanensis*: N) Leaves; O) fruit; P) flower. Scale bar = 2.0 mm

Female. Similar to male, differing by the body more robust. Length from clypeal apex to pygidium apex, 10.5 mm; width across humeri, 3.5 mm. Mandibles moderately angulate.

Paratypes. Length from clypeal apex to pygidium apex, 8.5–9.5 mm; width across humeri, 2.5–3.0 mm. Umbone slightly variable in size. Anterior black maculae on elytra variable in size, not reaching suture or barely reaching it; black posterior elytral area with its anterior margin straight or upwardly directed, reaching or not anterior black macula (Fig. 1J–M).

Type material. Holotype male (CER-UADY) labeled: México, Yucatán, Mérida, Parque Anikabil, 20.989858 N, 89.688328 W, 10 m, vii-31-2022, L. Peraza col. (White, printed), sobre *Dictyanthus yucatanensis* (White, printed), Holotype, *Tetraopes paradisi* **sp. nov.**, LPccer5, L. Peraza det. (Red, printed); 1 **allotype** female (LP) labeled: México, Yucatán, Mérida, Parque Anikabil, 20.988499 N, 89.688100 W, 10 m, vii-30-2022, L. Peraza col. (White, printed), sobre

Dictyanthus yucatanensis (White, printed), Allotype *Tetraopes paradisi* **sp. nov.**, LPccer4, L. Peraza det. (Red, printed); 1 **paratype** male (CER-UADY) labeled: México, Yucatán, Mérida, Parque Anikabil, 20.989858 N, 89.688328 W, 10 m, vii-31-2022, L. Peraza col. (White, printed), sobre *Dictyanthus yucatanensis* (White, printed), paratype *Tetraopes paradisi* **sp. nov.**, LPccer7, L. Peraza det. (Red, printed); 1 **paratype** male (CER-UADY) labeled: México, Yucatán, Mérida, Parque Anikabil, 20.989858 N, 89.688328 W, 10 m, viii-02-2022, L. Peraza col. (White, printed), sobre *Dictyanthus yucatanensis* (White, printed), Paratype *Tetraopes paradisi* **sp. nov.**, LPccer8, L. Peraza det. (Red, printed); 1 **paratype** male (LP) labeled: México, Yucatán, Mérida, Parque Anikabil, 20.989858 N, 89.688328 W, 10 m, viii-10-2022, L. Peraza col. (White, printed), sobre *Dictyanthus yucatanensis* (White, printed), Paratype *Tetraopes paradisi* **sp. nov.**, LPccer9, L. Peraza det. (Red, printed); 1 **paratype** male (LP) labeled: México, Yucatán, Mérida, Parque Anikabil, 20.988499 N, 89.688100 W, 10 m, vii-31-2022, L. Peraza col. (White, printed), sobre *Dictyanthus yucatanensis* (White, printed), Paratype *Tetraopes paradisi* **sp. nov.**, LPccer6, L. Peraza det. (Red, printed); 1 **paratype** male (LP) labeled: México, Yucatán, Mérida, Parque Anikabil, 20.988499 N, 89.688100 W, 10 m, viii-22-2022, L. Peraza col. (White, printed), sobre *Dictyanthus yucatanensis* (White, printed), Paratype *Tetraopes paradisi* **sp. nov.**, LPccer10, L. Peraza det. (Red, printed); 1 **paratype** male (LP) labeled: México, Yucatán, Mérida, Parque Anikabil, 20.988585 N, 89.686574 W, 10 m, viii-09-2023, L. Peraza col. (White, printed), sobre *Dictyanthus yucatanensis* (White, printed), Paratype *Tetraopes paradisi* **sp. nov.**, LPccer11, L. Peraza det. (Red, printed).

Remarks. This species differs from *T. ineditus* by the larger anterior black macula, narrower black area of the elytra, the lack of maculae on anterior edge of this area, and the sparser ventral yellowish-gray pubescence. It differs from *T. paracomes* and *T. comes* by the subaligned punctate elytra, anterior margin of the black area of the elytra without black elongate macula (present in *T. paracomes* and *T. comes*), and not inclined backward close to suture (directed backward in *T. paracomes* and *T. comes*); it also lacks the yellowish-gray pubescence on the umbone (present in *T. comes*), and ventrite 5 of females without depression (present in *T. paracomes*). It differs from *T. cleroides* Thomson, 1860 by the elytra with the anterior black macula distinctly larger, anterior margin of the black area of the elytra lacking black macula (present in *T. cleroides*), and not inclined backward close to suture (directed backward in *T. cleroides*), and the absence of yellowish-gray pubescence on the umbone (present in *T. cleroides*).

The new species was found associated with an asclepiad vine, *Dictyanthus yucatanensis* Standl. (Fig. 1N–P), endemic to the Peninsula of Yucatán. All specimens of the new species were collected between July 30 and August 22, on two flowering and one vegetative individuals of this asclepiad vine located approximately 130 to 240 m apart from each other. Other species of Apocynaceae vines were growing in the area but we did not find individuals of the new species on any of them.

The area of the type locality is under high human pressure due to the expansion of residential developments around the state's capital city and nearby beaches. The seasonally dry tropical forest is quickly being replaced by housing for people seeking the famous public safety and peaceful living conditions of the state of Yucatán. Some areas with remnants of forests have been preserved as parks; however, these areas are frequently trimmed to reduce the herbaceous layer to a height of approximately 10 cm above ground level. Furthermore, these parks serve as illegal dumping grounds and sources of wood, firewood, and soil. By the time of submission of this work, two out of three of the host plants were already trimmed to an approximately 20 cm long portion of its semi-decumbent woody stem and died shortly afterwards.

Etymology. The Latin specific epithet "*paradisi*" means "of the park" and it is used here for referring to the area where the species was found ("Parque Arqueo-Botánico Anikabil" or "Parque Anikabil" for short).

Nomenclature. ZooBank registration can be found at: urn:lsid:zoobank.org:pub:85904004-5782-4C63-9B0A-4A86A0829F28.

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