A new species of *Stigmaeus* (Acari: Trombidiformes: Stigmaeidae) from Brazil

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**Abstract**

A new species of the genus *Stigmaeus*, *S. brasiliensis* sp. nov. is described based on females, males and deutonymphs, collected from the São Paulo state, Brazil.

**Key words:** Female; predatory mites; Prostigmata; Raphignathoidea; São Paulo state.

**Introduction**

The family Stigmaeidae has a worldwide range of distribution. These mites are found in various ecosystems such as soil, moss and lichen, foliage, branches, trunks, litter, etc. (Fan and Zhang 2005). Many of Stigmaeidae are generalist predators mainly feeding on gall and rust mites (Eriophyoidea), spider mites (Tetranychidae), false spider mites (Tenuipalpidae), broad mites (Tarsonemidae) and other mites in the field and greenhouses (Fan and Flechtmann 2015). *Stigmaeus* is one of the oldest and most diverse genera in the Stigmaeidae. Although 141 species of *Stigmaeus* are known worldwide (Doğan et al. 2015; Khaustov 2015), before this study, only one species had been reported from the Brazil, namely *Stigmaeus constrictus* Summers, 1962 by Flechtmann (1981). In this paper, we describe *Stigmaeus brasiliensis* sp. nov., as the first new species of *Stigmaeus* from Brazil.

**Material and methods**

Mites were extracted from leaves by using a Berlese-Tullgren funnel. Specimens were cleared in Nesbitt's fluid, mounted in Hoyer's medium (Walter and Krantz 2009) and were examined under a phase contrast microscope (Olympus, BX41). Illustrations were done with a drawing tube attached to the phase contrast microscope. The length of the gnathosoma was measured from the base to the tip of the subcapitulum, the length of the idiosoma from the suture between the gnathosoma and idiosoma to the posterior
margin of the idiosoma, the width of the idiosoma at its broadest level, and the legs from the ventral insertion of coxae to the base of the pretarsi. The terminology and abbreviations are based on Grandjean (1944) and Kethley (1990). All measurements are given in micrometers (μm) for the holotype and paratypes (in parentheses).

Results

Genus *Stigmaeus* Koch, 1836

*Type species:* *Stigmaeus cruentus* Koch, 1836.

*Stigmaeus brasiliensis* sp. nov. (Figs. 1–16)

**Description**

**Female** (n = 4) – Length of idiosoma 411 (348–487); length of gnathosoma with palp 163 (145–165); width of idiosoma 313 (286–384). Length of legs I–IV (from base of coxa to tip of tarsal claw): 312 (246–317); 248 (202–255); 221 (203–243); 275 (236–296).

**Dorsum** (Figs. 1, 2) – Dorsum with 13 pairs of setae (setae *h*3 absent). All dorsal shields reticulated; propodosomal shield with three pairs of setae (*vi, ve* and *sci*); eyes and postocular bodies (*pob*) absent; setae *sce* located on auxiliary shields; central hysterosomal shield with three pairs of setae (*c1, d1, e1*); setae *d2* located on marginal hysterosomal shields; humeral shields situated latero-ventrally and bearing setae *c2*; intercalary shields divided and with setae *f1*; *e2* situated on lateral zonal shields; suranal shield entire and with two pairs of setae (*h1* and *h2*); all dorsal setae (except setae *ve*) distinctly barbed in distal half, with a small membrane or hyaline sheath (some para-types without a small membrane); setae *ve* (Fig. 2) pointed distally and with so few faint serrations although at first glance to appear smooth. Lengths of dorsal setae: *vi* 53 (48–61); *ve* 99 (75–110); *sci* 43 (37–44); *sce* 62 (55–67); *c1* 61 (47–64); *c2* 59 (50–65); *d1* 64 (50–68); *d2* 62 (48–71); *e1* 63 (48–68); *e2* 62 (51–67); *f1* 69 (52–74); *h1* 61 (54–65); *h2* 72 (58–75). Distances between dorsal setae: *vi–vi* 20 (22–24); *ve–ve* 85 (73–96); *vi–ve* 71 (47–67); *ve–sci* 53 (43–62); *sci–sci* 149 (126–170); *sce–sce* 208 (172–230); *sci–sce* 28 (23–34); *c1–c1* 91 (67–100); *c1–d1* 69 (56–78); *c1–c2* 125 (78–114); *c2–c2* 291 (232–331); *d1–d1* 88 (82–103); *d1–d2* 71 (58–95); *d1–e1* 72 (53–82); *d2–e2* 78 (75–102); *e1–e1* 80 (62–84); *e1–e2* 51 (55–74); *e1–f1* 42 (39–63); *f1–f1* 110 (102–128); *f1–h1* 42 (46–63); *f1–h2* 30 (33–52); *h1–h1* 45 (42–47); *h2–h2* 108 (86–110); *h1–h2* 30 (23–31).

**Venter** (Fig. 3) – Endopodal shields with reticulations, well divided by striae and with three pairs of ventral setae (*1a, 3a* and *4a*). Aggenital plate with two pairs of aggenital setae (*ag1, ag2*); anogenital area with one pair of genital setae (*g1*) and three pairs of pseudanal setae (*ps1–ps3*); all ventral setae smooth and pointed, except for setae *ps1–ps3* which are barbed. Measurements of setae: *1a* 28 (22–28); *3a* 30 (23–28); *4a* 28 (22–30); *ag1* 27 (23–30); *ag2* 24 (18–23); *ps1* 33 (26–40); *ps2* 28 (24–28); *ps3* 24 (22–26); *g1* 16 (14–19).

**Gnathosoma** (Fig. 4) – Subcapitulum 98 (72–92) (Fig. 4) with reticulations, bearing subcapitular setae *m* 25 (23–26) and *n* 23 (18–27), and adoral setae *or1* 23 (18–22) and *or2* 30 (22–30). Distance *m–m* 30 (26–34), *n–n* 30 (28–30), *m–n* 11 (12–15). Palpus 120 (102–123) long (Fig. 4), palptrochanter without setae; palpfemur with three setae; palpgenu with two setae; palptibia with two tactile setae + one well-developed claw + one spine-like accessory claw; palptarsus with four tactile setae + one solenidion (*ω*),
one subapical eupathidium and one distal trifid eupathidium.

Legs (Figs. 1, 5–8) – All legs with reticulations. Setation: coxae (excluding 1a, 3a and 4a) 2+elcp-2-2-2, trochanters 1-1-2-1, femora 6-5-3-2, genua 3(+1κ)-3(+1κ)-1-1, tibiae 5(+1φ+1φρ)-5(+1φ)-5(+1φ)-5(+1φ), tarsi 13(+1ω)-9(+1ω)-7(+1ω)-7(+1ω). Length of solenidia: ωI 28 (24–31); ωII 22 (22–27); ωIII 35 (25–38); ωIV 20 (15–23); φI 12 (13–14); φII 28 (21–30); φII 20 (17–21); φIII 16 (13–18); φIV 21 (15–20); κI 55 (38–52); κII 10 (8–9).


Male similar to female but differs in that setae sce are located on propodosomal shield (auxiliary shields partially fused to the propodosomal shield) (Fig. 9), aggenital area with two pairs of setae (ag1, ag2) (Fig. 10), anogenital area without genital setae.
and with three pairs of pseudanal setae \((ps_1–ps_3)\); tarsi I–IV bear an extra solenidion (Figs. 11–14).


Deutonymph similar to female but differs in that setae \textit{ei} are located on two separated median zonal shields (Fig. 15), anogenital area with two pairs of aggenital setae (\textit{ag1}, \textit{ag2}), three pairs of pseudanal setae (\textit{ps1–ps3}) and without genital setae (Fig. 16); trochanters I–IV 1-1-2-0, femora I–IV 6-4-3-2, genua I–IV 3(+1κ)-2(+1κ)-0-0.

Etymology

The specific epithet is derived from the country of origin “Brazil”.

Type material

Holotype and five paratype females, four paratype males and three paratype deutonymphs from samples of litter under semi-deciduous and xeromorphic plants collected at Valparaiso (21° 14' 13" S, 50° 46' 38" W) and Ipaussu (23° 05' 43" S, 49° 37' 27" W) cities, São Paulo state, Brazil on 12 Feb. 2015, by Jorge L. Muñoz Marticorena. The holotype and three paratype females, two paratype males and two paratype deutonymphs are deposited in the Acarological collection of Departamento de Entomologia e Acarologia, ESALQ-USP, Piracicaba, São Paulo State, Brazil, one paratype female and one paratype male are deposited in the Acarological Collection, Department of Plant Protection, Faculty of Agriculture, University of Maragheh, Maragheh, Iran and one paratype female, one paratype male and one paratype deutonymph are deposited in the Acarological Collection, Jalal Afshar Zoological Museum, Department of Plant Protection, Faculty of Agriculture, University of Tehran, Karaj, Iran.

Remarks

The new species closely resembles Stigmaeus fissicomus Ueckermann & Meyer, 1987 and S. impressus Wood, 1971 in having reticulated dorsal shields, three pairs setae on the central plate, the same leg chaetotaxy, two pairs of aggenital and one pair of genital setae; however, it can be distinguished by 1) lacking eyes (present in other species); 2) lacking postocular bodies (present in S. fissicomus); 3) lacking rosette-like areas (present in other species); 4) dorsal body setae d1–f1 and e2 distinctly barbed in distal half (setae d1–f1 and e2 asymmetrically forked distally in S. fissicomus); 5) dorsal body setae ve faintly barbed (smooth in S. impressus).

Stigmaeus brasiliensis sp. nov. also resembles S. campbellensis Wood, 1970, S. clitellus Summers, 1962, S. comatus Summers, 1962 and S. scaber Summers, 1962 in having reticulated dorsal shields, three pairs setae on the central plate and the same femora chaetotaxy; but differs from them by the following combination of characters: 1) two pairs of aggenital setae (three in S. campbellensis and S. scaber [based on Koç & Ayyeldiz (1997)]); 2) lacking eyes (present in S. campbellensis and S. clitellus); 3) intercalary plate divided (fused or single in S. clitellus and S. comatus); 4) genua I–IV with 4-4-1-1 setae, respectively (4-3-0-1 setae in S. clitellus and S. comatus); 5) lacking postocular bodies (present in other species).

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References


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گونه جدیدی از Stigmaeus (Acari: Trombidiformes: Stigmaeidae) از برزیل

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چکیده

گونه جدیدی از جنس Stigmaeus به نام S. brasiliensis sp. nov. Stigmaeus پوستهٔ سیاه‌رنگ دومین جمعیت از ایالت سانیپانولو برزیل و جایگزینی می‌کند.

واژگان کلیدی: ماده، منویه‌های ماده، نوآور آناتومی، راه‌حل‌های روانه و نوآور شکارگر، سایه‌برداری، شکارگر، سانیپانولو، سانیپانولو.

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