Journal of Natural History
Publication details, including instructions for authors and subscription information:
http://www.informaworld.com/smpp/title~content=t713192031

Description of a new Tetranychus (Acarina, Prostigmata: Tetranychidae) pest of Musa from French Guiana

Philippe Auger [a]; Alain Migeon [a]; Carlos H. W. Flechtmann [b]
[a] Centre de Biologie et de Gestion des Populations (CBGP), Institut National de la Recherche Agronomique (INRA), Montpellier, France [b] Departamento de Entomologia, Fitopatologia e Zoologia Agrícola, Universidade de São Paulo/ESALQ, Piracicaba, Brasil

Online Publication Date: 01 January 2008

To cite this Article Auger, Philippe, Migeon, Alain and Flechtmann, Carlos H. W.(2008)'Description of a new Tetranychus (Acarina, Prostigmata: Tetranychidae) pest of Musa from French Guiana',Journal of Natural History,42:27,1885 — 1892
To link to this Article: DOI: 10.1080/00222930802109850
URL: http://dx.doi.org/10.1080/00222930802109850

Journal of Natural History
Vol. 42, Nos. 27–28, July 2008, 1885–1892

Description of a new *Tetranychus* (Acarina, Prostigmata: Tetranychidae) pest of *Musa* from French Guiana

Philippe Auger[a]*, Alain Migeon[a] and Carlos H.W. Flechtmann[b]

[a]*Centre de Biologie et de Gestion des Populations (CBGP), Institut National de la Recherche Agronomique (INRA), Montpellier, France;* [b]*Departamento de Entomologia, Fitopatologia e Zoologia Agrícola, Universidade de São Paulo/ESALQ, Piracicaba, Brasil*

(Received 11 July 2007; final version received 4 December 2007)

A new species of tetranychid mite, genus *Tetranychus* Dufour, 1832, is described and illustrated herein from neotropical area. *Tetranychus musae* sp. nov. (Acari, Prostigmata: Tetranychidae) differs from other species in the genus by the combination between the arrangement of leg setae on females tarsus I and the shape of the aedeagus. Tarsus I bears one tactile setae proximal to proximal duplex setae and three tactiles in line or almost in line with proximal duplex setae. The aedeagus knob consists of an acute posterior projection bent ventrally and a larger anterior rounded projection directed anterodorsally. *T. musae* specimens were collected in French Guiana where they appeared to be a pest of *Musa* sp. A key to adults of neotropical species of the genus *Tetranychus* feeding on banana is provided.

Keywords: Acari; Tetranychidae; *Tetranychus musae* sp. nov.; *Musa*; French Guiana

Introduction

Bananas are attacked by 20 species of *Tetranychus* all over the world. Among them, 15 are reported from South America and only one from French Guiana, namely *Tetranychus urticae* Koch 1836 (Bolland et al., 1998; Migeon and Dorkeld, 2006).

In this paper we report and describe a new pest of banana, a new species of *Tetranychus sensu stricto* collected on infested banana leaves in French Guiana. A key is also presented for identification of known species of *Tetranychus* found in neotropical areas and feeding on *Musa* sp. It should be a useful updated diagnosis tool.

Material and methods

Mites were collected directly from field samples in 70% ethyl alcohol. Following clearing in lactic acid (50%) for at least 48 hours they were mounted in Hoyer's medium (gum arabic 30 g, chloral hydrate 200 g, distilled water 50 ml and glycerine 20 ml). The specimens were examined using a Leica DM LB 2 phase contrast microscope and illustrated with the aid of a drawing tube attachement.

The setal nomenclature used in the description follows Lindquist's system (1985). All measurements are given in micrometers and correspond to the holotype or

*Corresponding author. Email: auger@supagro.inra.fr

ISSN 0022-2933 print/ISSN 1464-5262 online

DOI: 10.1080/00222930802109850
http://www.informaworld.com

average measurements, followed (in parentheses) by minimum and maximum values from paratypes.

Taxonomy

Tetranychus (Tetranychus) musae sp. nov.
(Figures 1–3)

Type material

Holotype. Institut National de la Recherche Agronomique (INRA), Centre de Biologie et de Gestion des Populations (CBGP), 34988 Montferrier-sur-Lez, France, from *Musa* sp. (Musaceae), Matoury, French Guiana, October 2005.

Paratypes. INRA, CBGP, 34988 Montferrier-sur-Lez, France, eight males, six females and seven nymphs, from *Musa* sp. (Musaceae), Matoury, French Guiana;

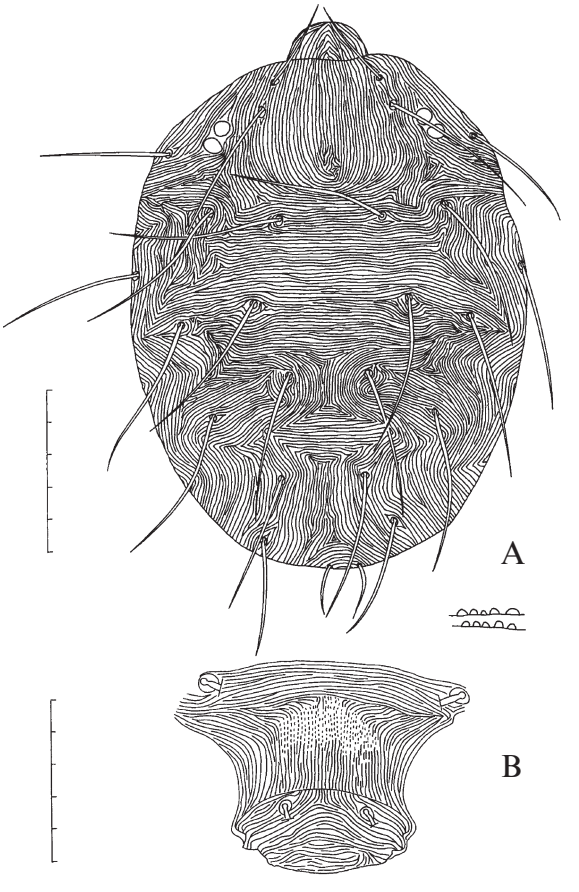
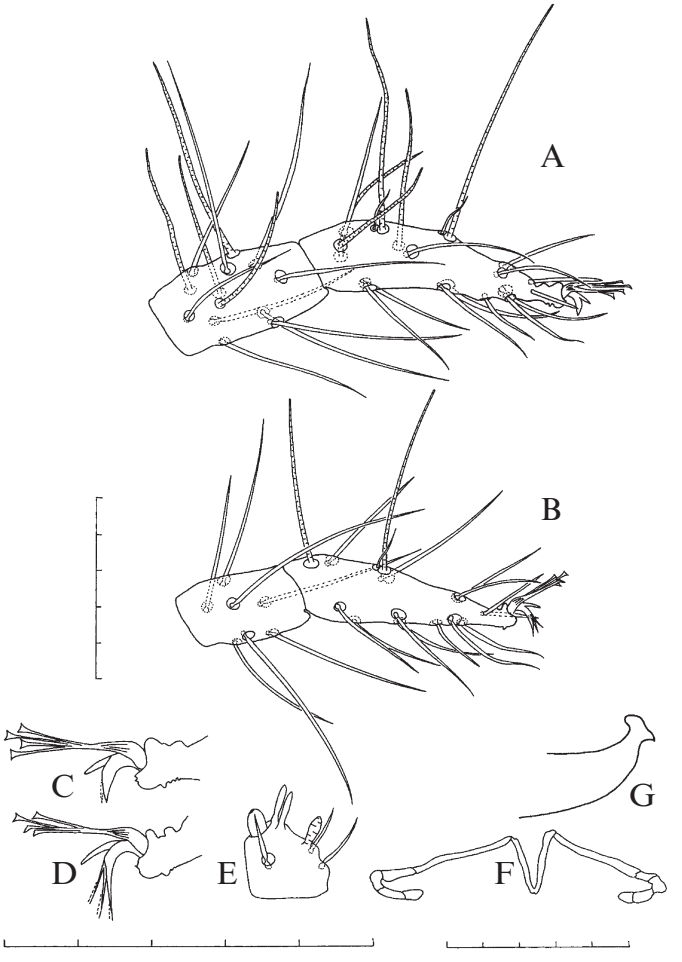


Figure 1. *Tetranychus musae* sp. nov., female. (A) Dorsal aspect (scale bar=125 μm,1 div.=25 μm); (B) genital area (scale bar=50 μm, 1 div.=10 μm).

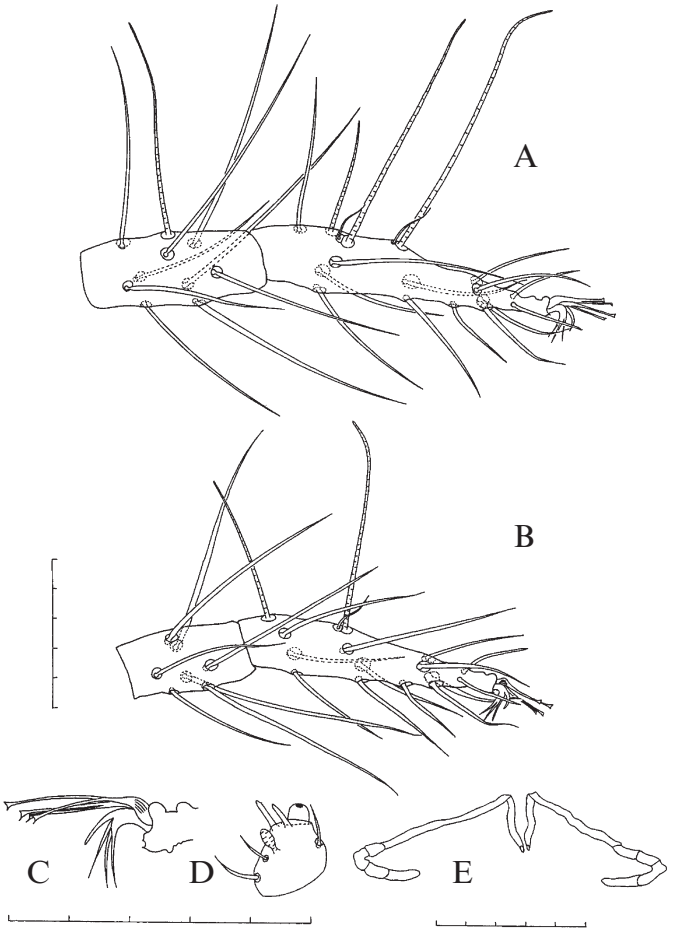


Figures 2. *Tetranychus musae* sp. nov., male. (A) Tarsus and tibia I; (B) tarsus and tibia II; (C) empodium I; (D) empodia II–IV; (E) palptarsus; (F) peritreme; (G) aedeagus (enlarged) (scale bar=50 μm, 1 div.=10 μm).

Muséum national d'Histoire naturelle, Paris (MNHN), two males, two females and two nymphs, from *Musa* sp. (Musaceae), Matoury, French Guiana.

Diagnosis

Among members of *Tetranychus* from the sixth group as defined by Flechtmann and Knihinicki (2002) (one tactile setae proximal to and three tactile setae in line with proximal duplex setae of tarsus I, empodial dorsomedian spur obvious), this species is distinctive by the shape of the aedeagus. It is quite close to that of *Tetranychus yusti* McGregor 1955, placed in the seventh group by Flechtmann and Knihinicki (2002) (one tactile setae proximal to and three tactile setae in line with the proximal duplex setae of tarsus I, empodial dorsomedian spur tiny or absent), but differs from the latter in that the axis of the knob of the aedeagus and the shaft form an acute angle. Moreover, empodia II–IV bear obvious mediodorsal spurs and the terminal



Figures 3. *Tetranychus musae* sp. nov., female. (A) Tarsus and tibia I; (B) tarsus and tibia II; (C) empodia I–IV; (D) palptarsus; (E) peritreme (scale bar = 50 µm, 1 div. = 10 µm).

sensillum is nearly as long as broad, instead of tiny mediodorsal spurs and a terminal sensillum about two and a half times as long as broad in *T. yusti*. The aedeagus of *T. musae* also resembles that of *Tetranychus tumidus* Banks 1900. However in this last species its axis does not form an angle (or a very small one) with the axis of the shaft and the anterior projection is not so developed compared to the posterior, which is not directed downward as in this new species. Moreover, the setal pattern of tarsus I of *T. tumidus* corresponds to species belonging to the eighth group in the key to the major groups of *Tetranychus*.

Description of the male

Holotype 415 µm long (including gnathosoma).

Gnathosoma. The palptarsus terminal sensillum is about one and a fifth times as long as broad. The peritreme is hooked distally.

Dorsum. Dorsal body setae (lenght of holotype and variations of ten paratypes): v_2 55 (52–60); sc_1 103 (95–104); sc_2 69 (65–73); c_1 86 (87–90); c_2 86 (82–90); c_3 85 (81–89); d_1 88 (83–91); d_2 81 (87–95); e_1 (82–92); e_2 (89–96); f_1 (57–67); f_2 48 (44–53); h_1 21 (19–23). A few irregular lobes on opisthosomal striae are found between setae sc_1 and e.

Venter. Ventral striae without lobe.

Legs. Empodium I consists of a double claw-like structure with a strong mediodorsal spur about one half of the apppendages. Empodia II–IV bear three pairs of proximoventral hairs and a large mediodorsal spur about one half the length of proximoventral hairs. Leg chaetotaxy as follows (number of setae refers to tactile setae and sensory setae are given in parentheses):

I. 2−1−10−5−9+(4)−13+(3)+2 duplexes;
II. 2−1−6−5−7−13+(1)+1 duplex;
III. 1−1−4−4−6−9+(1);
IV. 1−1−4−4−7−10+(1).

Aedeagus. The shaft of the aedeagus curves upward. The knob of the aedeagus is about two and a half times the width of the stem. The knob consists of an acute posterior projection bent ventrally and a larger anterior rounded projection directed anterodorsally forming a small depression on the dorsum. Its axis forms an acute angle with the axis of the shaft.

Description of the female

Eight females measured. Idiosoma: length 348–453 μm, gnathosoma 106–123 μm, width 283–314 μm.

Gnathosoma. Palpus with a spinneret as long as broad. The peritreme is hooked distally.

Dorsum. Dorsal body setae are lanceolate, longer than distances between bases of consecutive setae (variations of 8 paratypes): v_2 71–80; sc_1 128–149; sc_2 95–101; c_1 117–143; c_2 118–131; c_3 112–130; d_1 121–138; d_2 114–140; e_1 112–136; e_2 116–138; f_1 109–124; f_2 83–101; h_1 38–48. The hysterosomal striation is transverse except between the bases of setae e_1 and f_1 (longitudinal) forming a diamond-shaped pattern between these setae. Dorsal hysterosomal striae with lobes rounded and broader than tall.

Venter. The area immediatly anterior to genital flap has broken longitudinal striae partly dash-like. The genital flap has transverse arched striae. Rounded lobes broader than tall are present. One pair of paranal setae is present.

Legs. Empodia I–IV bear three pairs of proximoventral hairs and large mediodorsal spurs about one half the length of proximoventral hairs. Leg chaetotaxy as follows (number of setae refers to tactile setae and sensory setae are given in parentheses):

I. 2−1−10−5−9+(1)−13+(1)+2 duplexes;
II. 2−1−6−5−7−13+(1)+1 duplex;
III. 1−1−4−4−6−9+(1);
IV. 1−1−4−4−7−10+(1).

Tarsus I with one tactile setae proximal to proximal duplex setae with three tactiles in line or almost in line with proximal duplex setae. Solenidion is at or near the level of the proximal duplex.

Etymology

The species designation, *musae*, refers to the host plant on which mites were collected.

Biological observations

Adults of this species are orange-brown in colour with clear legs and they produce webbing. Feeding by this species causes browning and necrosis of the affected leaf areas. Outbreaks of this species require spraying of specific acaricides to avoid leaf burning of infested banana leaves.

Identification key

The 15 species recorded on *Musa* from South America belong to the subgenus *Tetranychus sensu stricto* as defined by Tuttle and Baker (1968). Construction of the key below is based on data of Migeon and Dorkeld (2006). It is also mainly based on the key to the major groups of *Tetranychus* of Flechtmann and Knihinicki (2002).

Key to the neotropical species of *Tetranychus* feeding on banana

1. Female tarsus I with the proximal pair of duplex setae in line with all the four proximal tactile setae 2
Female tarsus I with the proximal pair of duplex setae in line with three proximal tactile setae or distad to tactile setae 3
2. Knob of aedeagus without posterior projection. Anterior projection small and acuminate . . . . . *T. ludeni*, Zacher, 1913
Knob of aedeagus bearing acute anterior and posterior projections. Posterior projection curved ventrad . . . . . *T. desertorum*, Banks, 1900
3. Female tarsus I with one tactile setae proximal to and three tactile setae in line with the proximal pair of duplex setae 4
Proximal pair of duplex setae on female tarsus I distal to proximal tactile setae 6
4. Aedeagus knob bearing posterior and anterior acute projections, dorsal margin of the knob rounded 5
Aedeagus knob asymmetrical. Anterior projection rounded, posterior acute and bent ventraly. Dorsal margin of the knob with a small depression . . . . . *T. musae* sp. nov.
5. Projections of the aedeagus knob well developped . . . . . *T. andrei*, Baker and Pritchard, 1960
Projections of the aedeagus knob small *T. abacae*, Baker and Pritchard, 1962

6. Female tarsus I with four tactile setae immediatly behind the proximal pair of duplex setae . . . . . *T. yusti*, McGregor, 1955

Female tarsus I with proximal pair of duplex setae not so close to proximal four tactile setae 7

7. Female empodia with an obvious dosomedian spur 8

Female empodia with dorsomedian spur tiny or absent 10

8. Aedeagus knob with anterior and posterior projections acute. Posterior larger . . . . . *T. mexicanus* (McGregor, 1950)

Aedeagus knob with anterior projection rounded and posterior acute . . 9

9. Aedeagus knob ducklike, dorsal margin rounded . *T. gloveri*, Banks 1900

Aedeagus knob dorsal margin with a depression . *T. tumidus*, Banks 1900

10. Aedeagus knob with both anterior and posterior projections acute . . . 11

Aedeagus knob with at least one rounded projection 13

11. Aedeagus knob well developped, anterior projection small, posterior longer. Axis of the knob forming an angle with the axis of the shaft. . . . . *T. marianae*, McGregor, 1950

Aedeagus knob small 12

12. Dorsal margin of the knob rounded . . . . . *T. urticae*, Koch, 1836

Knob virtualy absent, dorsal margin small and straight . . . . . *T. piercei*, McGregor, 1950

13. Both aedeagus knob projections rounded, knob berry-shaped . . . . . *T. neocaledonicus*, André,1933

Aedeagus knob anterior projection rounded, posterior acute. 14

14. Dorsal margin of the knob rounded 15

Dorsal margin of the knob angulate, knob well developped . . . . . *T. turkestani*, (Ugarov and Nikolskii, 1937)

15. Aedeagus knob large, about one-third as long as the shaft, male empodia with obvious spurs . . . . . *T. kanzawai*, Kishida, 1927

Aedeagus knob smaller, about one-fourth to one-fifth the lenght of the dorsal margin of the shaft, male empodium I with a tiny spur . . . . . *T. lombardinii**, Baker and Pritchard, 1960

**T. lombardinii* is reported from Guadeloupe feeding on *Jatropha* sp. (Flechtmann et al. 1999) but not on *Musa* sp. As this species feeds on *Musa sapientum* in South Africa (Meyer and Rodrigues 1965), it has been included into the key.

Acknowledgements

We acknowledge Damien Laplace (SPV Guyane) for collecting, sending the mite specimens and for providing biological information concerning this species.

References

Bolland HR, Gutierrez J, Flechtmann CHW. 1998. World catalogue of the spider mite familly (Acari: Tetranychidae). Leiden (Netherlands): Brill Academic Publishers. 392 p.

Flechtmann CHW, Knihinicki D. 2002. New species and new record of *Tetranychus* Dufour from Australia with a key to the major groups in this genus based on females (Acari: Prostigmata: Tetranychidae). Austr J Entomol. 41:118–127.

Flechtmann CHW, Kreiter S, Etienne J, Moraes GJ. 1999. Plant mites (Acari) of the French Antilles. 1. Tetranychoidea (Prostigmata). Acarologia. 40:137–144.

Lindquist EE. 1985. 1.1.1. External anatomy. In Helle W, Sabelis MW, editors. Spider mites. Their biology, natural enemies and control. Vol. 1A. Amsterdam (Netherlands): Elsevier Science Publishing. p. 3–28.

Meyer MKP, Rodrigues MC. 1965. Acari associated with cotton in South Africa (With reference to other plants). Garcia de Orta. 13:193–226.

Migeon A, Dorkeld F. 2006. Spider Mites Web. Available from: http://www.montpellier.inra.fr/CBGP/spmweb. Accessed 2007 June 28.

Tuttle DM, Baker EW. 1968. Spider mites of Southwestern United States and a revision of the family Tetranychidae. Tucson (AZ): University of Arizona Press. 143 p.