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Presence of *Isometrus maculatus* (DeGeer) (Scorpiones, Buthidae) in the central savannas of Brazil

Wilson R. Lourenço & Paulo C. Motta

[1] Muséum national d'Histoire naturelle, Sorbonne Universités, Institut de Systématique, Evolution, Biodiversité (ISYEB), UMR7205-CNRS, MNHN, UPMC, EPHE, CP 53, 57 rue Cuvier, 75005 Paris, France: e-mail: wilson.lourenco@mnhn.fr
[2] Departamento de Zoologia, Universidade de Brasília. 70910-900 Brasília, DF, Brazil. E-mail: mottapc@unb.br

Abstract: The circumtropical species *Isometrus maculatus* (DeGeer) is reported from the central savannas of Brazil for the first time.
Key words: Scorpiones, Buthidae, *Isometrus maculatus*, savannas, central Brazil.

Presencia de *Isometrus maculatus* (DeGeer) (Scorpiones, Buthidae) en las sabanas centrales de Brasil
Resumen: Se cita por primera vez de las sabanas centrales de Brasil la especie circuntropical *Isometrus maculatus* (DeGeer).
Palabras clave: Scorpiones, Buthidae, *Isometrus maculatus*, sabanas, Brasil central.

As already outlined in some previous papers (Probst, 1972; Huber *et al*., 2002; Lourenço & Cloudsley-Thompson, 2012), *Isometrus* (*Isometrus*) *maculatus* (DeGeer, 1778) is unquestionable the most widely distributed scorpion species in the world. Its distribution has an anthropogenic background which probably can be dated from the period of great naval voyages of the 16th century. Now days, *I.* (*I.*) *maculatus* can be found in most tropical and subtropical coastal regions of the world, and the question concerning its possible original area of distribution in Asia was often addressed. Lourenço & Huber (2002) suggested that the original area of distribution of *I.* (*I.*) *maculatus* could be located in Sri Lanka since in this region of the world the species was found under really wild conditions inland.

Gysin and Le Corroller (1968) proposed a detailed study on the taxonomy of this species and equally listed a significant number of records from several regions of the world, including Africa, Asia, Tropical America and the Pacific Islands. Vachon (1972) plotted on a world map with an impressive number of places from which the species had been collected. Although some of these sites were not clearly justified. Again, these included sites in Africa, Asia, tropical regions of America and the Pacific Islands.

Lourenço & Cloudsley-Thompson (2012) noticed that almost all the desert and arid regions of the earth were excluded from these lists. In the case of Vachon's list, two arid sites were recorded for the coast of Somalia and east coast of Tunisia. Lourenço & Cloudsley-Thompson (2012) also presented one new record from the coastal deserts of Baja California, Mexico, in the region of Sainte Rosalia. These sporadic records of *I.* (*I.*) *maculatus* in arid regions suggested that this species, although strongly opportunistic, can only colonize and re-adapt to more tropical and moistened habitats and when randomly dispersed in arid and desert zones, any new population will be incapable of reaching its full potential (see also Fet & Lowe, 2000).

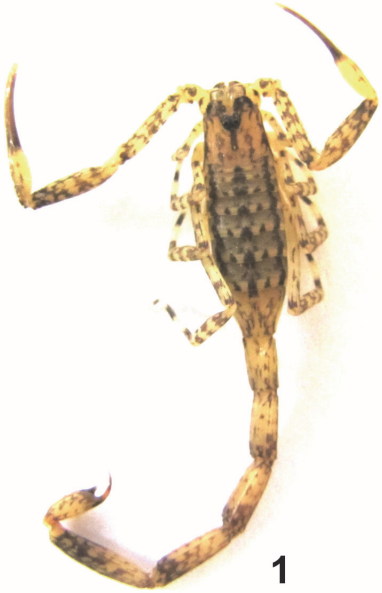
Scorpion species are globally separated into two general categories according to their life history strategies: Type K = equilibrium species and type r = opportunistic species (Polis, 1990; Lourenço, 1991). Most biological parameters of *I.* (*I.*) *maculatus* suggest the species to be strongly opportunistic. In fact, its remarkable reproductive potential is a possible explanation of its enormous ecological plasticity and capacity for dispersion. The duration of embryonic development ranges from 2.2 to 3.2 months while those of postembryonic development ranges from 4.5 to 5.6 months. Up to 6-7 multiple broods composed of 14 to 21 individuals have been observed without new fecundation (Huber *et al*., 2002). The adult lifespan probably reaches no more than 24-25 months (Probst, 1972). Consequently, these developmental periods are clearly shorter than those found in other species of Buthidae (Lourenço, 2002).

Records of *I.* (*I.*) *maculatus* from inlands locations are rather rare. Kovařík (2003) proposed a long list of locations for *I.* (*I.*) *maculatus*, some of which may be considered as inland. The data presented is however based on very old material and not necessarily reliable. More recent cases have been recorded from riverine sites near to the Amazon River in Brazil and another case was observed near the village of Kibombo riverine to the Lualaba River in Congo-Zaire (Lourenço, unpublished). In both cases, however these sites are in connection with major fluvial system (Amazon and Congo Rivers) in which the navigation of large ships is possible (Fet & Lowe, 2000).

In this note we present a most unusual case of one specimen of *I.* (*I.*) *maculatus* collected in the savannas of Central Brazil.

During one of his field expeditions performed from 2008 to 2009, the MSc student Raoni Japiassu Merisse collected one pre-adult female of *I. maculatus* (Fig. 1) under a termite mound, probably of *Silvestritermes euamignathus*, in the 'Reserva Ecológica do Roncador' (RECOR) which is associated to the 'Instituto Brasileiro de Geografia e Estatística' (IBGE), Brazil (Fig. 2, 3). This area was intensely prospected during the years 1970/1980 by the senior author and only three native scorpion species have been reported, namely *Tityus fasciolatus* Pessôa, *Bothriurus araguayae* Vellard and *Ananteris balzanii* Thorell (Lourenço, 1981). All three native species sheltered almost exclusively in the termite mounds of *S. euamignathus*. Subsequently, the invasive species *Tityus serrulatus* Lutz & Mello was recorded for several sites in the Federal District, but in all cases exclusively in urban areas; never in wild zones of natural cerrados (Lourenço *et al*., 1994).

Any explanation about the presence of *I. maculatus* in a wild Cerrado formation and in particular under a termite mound seems difficult. Any kind of fluvial transportation, as observed for other regions of the world cannot be retained since no main river systems are present in this region of Central Brazil. Only the transportation by road can be suggested, possibly by trucks transporting some kind of organic merchandise; a situation frequently observed for *T. serrulatus* (Lourenço *et al*., 1994). One of these road agents possibly deposited this organic merchandise containing females of *I. maculatus* in the Biological Reserve. These opportunistic females most certainly reproduced, as already exposed, and some of the juveniles dispersed in zones of the reserve. Nothing, however, attests to the fact that *I. maculatus*, was able to have an effective implantation in this Reserve. Only new possible collections can bring a better clarification to this strange occurrence





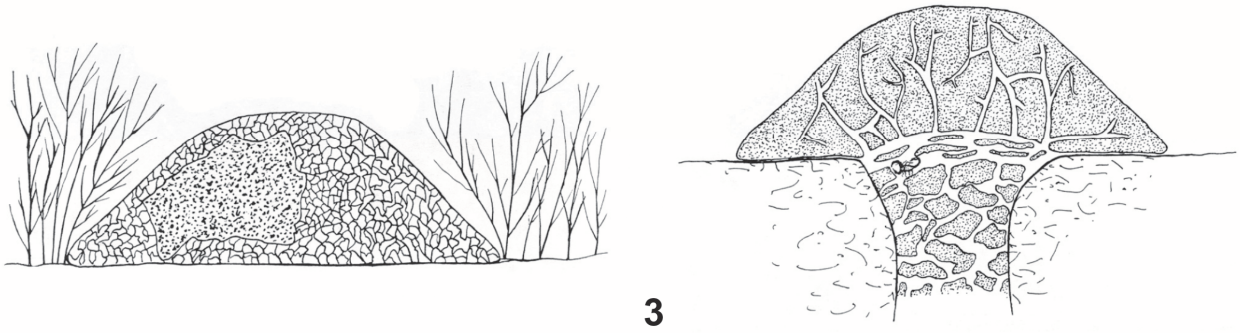


Fig. 1. Pre-adult female of *Isometrus maculatus* collected under a termite mound in the Cerrado of Central Brazil. **Fig. 2.** View of a Cerrado formation, of the 'campo-sujo' type with a termite mound of *Silvestritermes euamignathus* (arrow). **Fig. 3.** Schematic drawing of a termite mound of of *Silvestritermes euamignathus*. Left, the mound on external view. Right, internal view of the mound showing a scorpion in the central compartment. The average diameter of the mounds range from 30 to 40 cm.

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