

## SYSTEMATICS, MORPHOLOGY AND PHYSIOLOGY

### A New Brazilian Species of the Cricket Genus *Megalogyllus* Chopard (Orthoptera: Gryllidae)

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Nova Espécie de Grilo do Gênero *Megalogyllus* Chopard (Orthoptera: Gryllidae)

**RESUMO** - *Megalogyllus clamosus*, uma nova espécie de grilo do estado de São Paulo, é descrita. As fotografias do holótipo (macho) e do parátipo (fêmea) são apresentadas, assim como o desenho do tégmen direito do macho e a estrutura fállica. As fotografias da *pars stridens* para mostrar a estrutura dos dentes e o sonograma do canto de chamado do macho são também apresentados.

**PALAVRAS-CHAVE:** Grylloidea, estrutura fállica, taxonomia, bioacústica

**ABSTRACT** - *Megalogyllus clamosus* a new species of cricket from the São Paulo State (Brazil) is described. Photographs of the holotype (male) and of the paratype (female) are provided, as well as a drawing of the structure of the right tegmen of the male and of the phallic sclerite structure. Photographs of the *pars stridens* teeth and sonogram of the male calling song are also provided.

**KEY WORDS:** Grylloidea, phallic structure, taxonomy, bioacustics

In 1929 Chopard published the description of a new genus and species of cricket (*Megalogyllus molinai*), giving the collecting locality as "Types: Brésil: Manaos 1 ♂ Guyane anglaise". Chopard's paper shows the dorsal view of a male of the species but illustrations on the phallic structure were not included.

In 1964, Randell published a study on the phallic structure of several species of Gryllinae including his drawings (fig. 10a, b, c) as well as a description of the phallic sclerites (p. 1577-78) of the male type of *M. molinai*.

Collecting in a "cerrado" vegetation near Corumbatai town on November 11<sup>th</sup> 1985, a female of a not identified species of cricket was obtained (Fig. 1a). Since then, yearly collections in this locality, which measures about 300 ha, failed to obtain more specimens.

More than a decade later, December 1996, while collecting insects in the same locality, a very loud and continuous calling cricket song was heard. With the help of a directional microphone three males of a large cricket were captured. Cytological analysis of this specimens were unsuccessful because the meiotic process was already completed and only spermatozoa were observed. When dissection and drawings of the phallic structures were performed, a comparison with Randell's drawings showed that the Corumbatai specimens belonged to Chopard's genus *Megalogyllus*. The mention of the last author about the shape and size of the ovipositor proves that the single female collected in 1986 belongs to the same species than the three males collected a decade later (Fig. 1a).

A careful comparison of Randell's and our drawings on the male genitalia shows however some differences that justify to consider the Corumbatai specimens as a new species of *Megalogyllus*.

Type material is deposited in the collection of the Museu de Zoologia da Universidade de São Paulo (MZUSP) and in the collection of the Universidade Estadual Paulista (UNESP), campus of Rio Claro, SP.

#### *Megalogyllus clamosus* n. sp.

**Diagnosis.** The phallic structure of *M. clamosus* is quite similar to that drawn by Randell in his fig. 10a, b, c of *M. molinai*. The differences are: a) In *M. clamosus* a rami plate does not exist but a slightly more dense membrane connecting the PECS to the DECS. b) Randell's ectoparameres and mesal lobe are parts (right and left) of a single sclerite that in Randell's interpretation are divided at each side into ectoparameres and mesal lobe. c) The structure of the PENS which is connected by fibrillar tissue (as expected) with DENS is not clearly defined in his drawings.

Apart from differences in interpretations, Randell's and the drawing of this paper are quite similar but clearly different in details mainly in the structure that are here named DENS.

**Male (Fig. 1a, Table 1).** Color uniformly brown, lighter in the abdominal region. Tegmen as in Fig. 2. Fore tibia armed with



Figure 1. *M. clamosus*. A) male; B) female (enlargement bar = 10 mm)

three spurs in the apex, auditory organ on both sides of the proximal region, both oval in shape, the frontal one 1mm long and the hind half that length. Both fore tibia and femur 4,5 mm long with the three tarsi measuring together 2 mm long. Mesothoracic leg with the same measurements but with tibiae armed with four apical spurs. Hind tibiae with six external and five internal dorsal spines increasing in length towards the apice. Apical internal spurs dorsal and medium subequal in length 3.0 mm long, the ventral 0.5 long. Apical external spurs: the median 2 mm long the dorsal slightly shorter and the ventral 0.5 mm long. Hind metatarsus 3 mm long armed in the dorsum with four internal and six external denticles in the left leg (5-7 in the right leg) and with two apical spurs, the internal the longest. Hind femur glabrous, hind tibia and first and second pairs of legs slightly pubescent.

**Female (Fig. 1, Table 1).** Similar in color to male. Larger in size. Tegmina short, covering half of the abdomen. Wings 6 mm long probably dispensed after dispersal flight. Ovipositor short 3.8 mm long and slightly upcurved.

**Holotype male.** BRASIL (SÃO PAULO) Município de

Corumbataí, “cerrado” vegetation, Reserve of the Universidade Estadual Julio de Mesquita Filho (UNESP). 22° 14'33" S– 47° 41' 25" W, December 1996 (UNESP, Rio Claro). **Paratypes.** Same data, two males. Same data of collecting site, December 1985 (MZUSP), one female (UNESP, Rio Claro).

Table 1. Measurements (mm) of the types of *M. clamosus* n. sp.

	Holotype		Paratypes	
	Male	Female	Male	Female
Body length	22.4	23.0	26.0	25.0
Distances between eyes <sup>1</sup>	4.7	4.5	4.5	4.7
Pronotum length	3.5	3.5	3.6	3.5
Pronotum maximum width	5.5	5.7	5.5	5.9
Tegmen width	16.3	16.5	15.5	11.0
Hind femur length	12.5	12.5	11.0	12.8
Hind tibia length	8.0	8.0	8.0	8.0

<sup>1</sup>Maximum distance, external borders

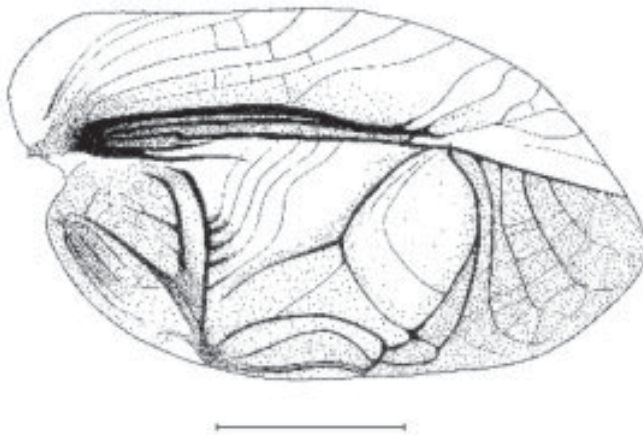


Figure 2. *M. clamosus* right tegmen of male specimen n° 3 (enlargement bar = 5 mm)

**Etymology.** The authors named the new species as “*clamosus*” because of the very loud and continuous calling song of the males.

**Phallic structure.** Phallic structure in dorsal, ventral lateral and rear view are depicted (Fig. 3). PECS: Represented by two parallel bars, connected in its rear end to DECS by fibrillar tissue (Fig. 3 a, b, c). DECS: A single sclerite covering the dorsal and lateral fields of the phallic rear end. The dorsal rear border is inwardly curved and provided with long hairs. In its lateral region it extends forward (Fig. 3a, b, c). PENS: It is a single H shaped sclerite with its fore branches limiting the spermatophoric chamber (Fig 3a, b) and with its rear projected branches connected by fibrillar tissue with DENS (Fig 3 c). DENS: Represented by a pair of single sclerites each one only apparently divided into two sclerites. The inner region nearly touch in the middle line and its rear projections are armed with tiny teeth (Fig. 3b, d). Stylet covering the dorsal middle line of the spermatophoric chamber (Fig. 3b).

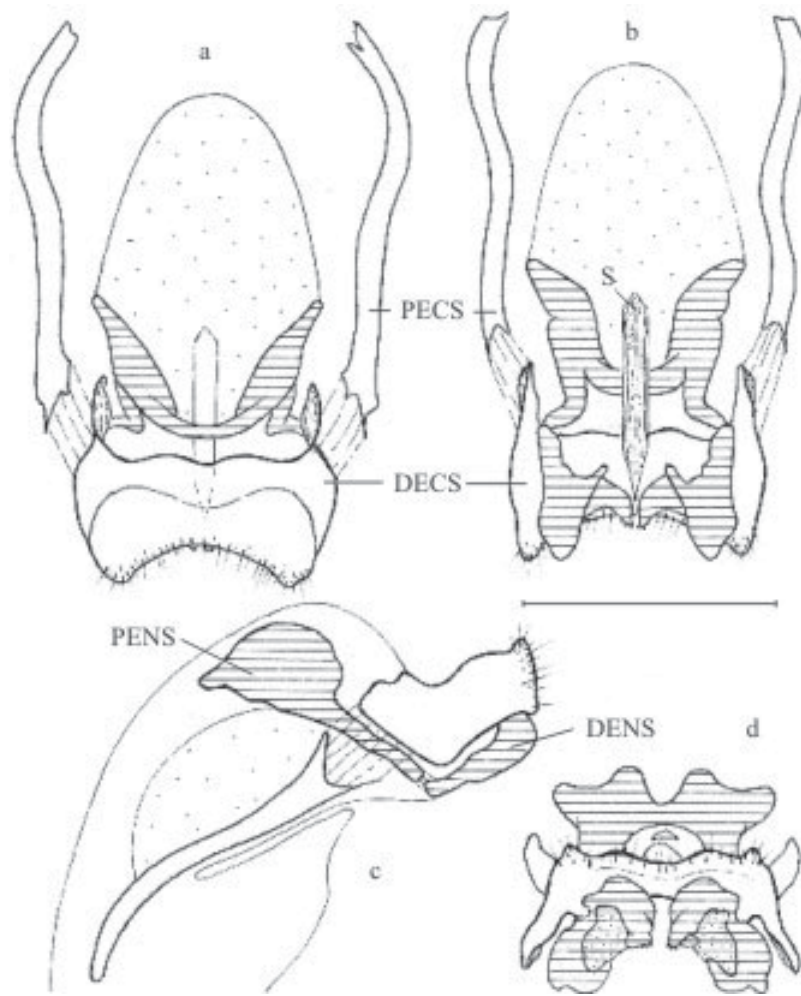


Figure 3. *M. clamosus* phallic structure. a) dorsal view, b) ventral view, c) lateral view, d) rear view. (PECS = proximal ectophallus sclerites, DECS = distal ectophallic sclerite, PENS = proximal endophallic sclerite, DENS = distal endophallic sclerites), S = stylet (enlargement bar = 1 mm)

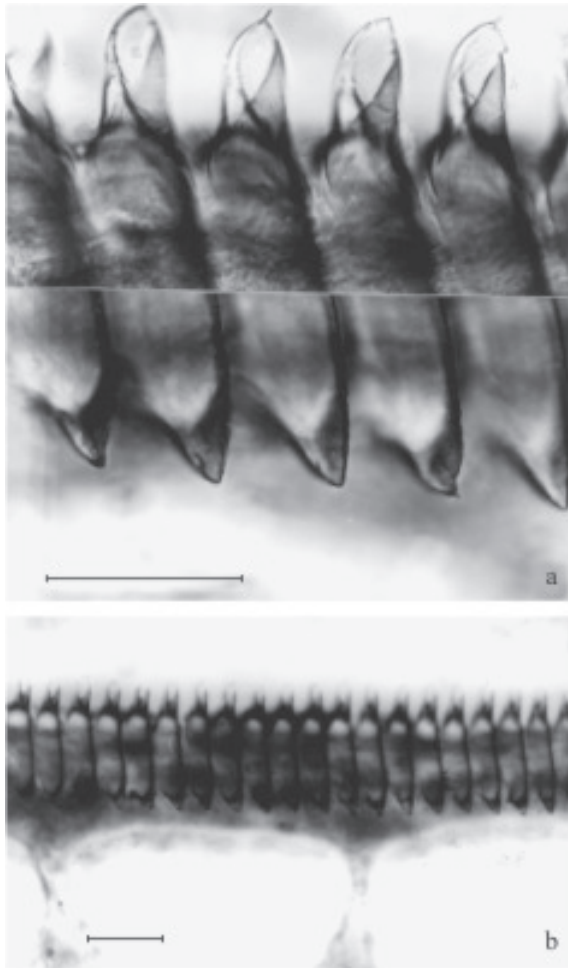


Figure 4. *M. clamosus* optical microscope view of an approximately median section of the par stridens. a) more enlarged to show terminal structure of teeth, b) the same section less enlarged (enlargement bar for each figure = 0.1mm)

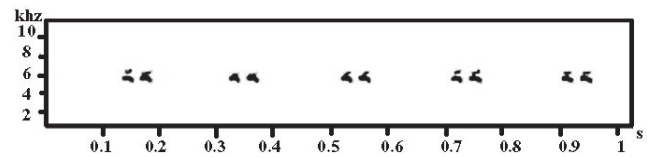


Figure 5. Sonogram of *M. clamosus*.

**Pars stridens.** Each tooth has an asymmetrical shape (Fig. 4a) with the cephalic end being hare ear shaped while the rear pointing end is conical. Each tooth is slightly tilted in relation to the *pars stridens* axe (Fig. 4b). Male paratype (specimen n° 3) has 165 teeth along 4.5 mm which means a density of 36.7 teeth/mm.

**Calling Song.** The calling song of *M. clamosus* (Fig. 5) is composed by pairs of chirps emitted to a speed of five pairs/second flowing continuously during periods of several minutes with a frequency of 4.9 Hz.

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