A new species of Pseudosaga (Orthoptera: Tettigoniidae: Mecopodinae) from Brandberg Massif, Namibia

Author: Naskrecki, Piotr

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A new species of *Pseudosaga* (Orthoptera: Tettigoniidae: Mecopodinae) from Brandberg Massif, Namibia

Piotr Naskrecki

Museum of Comparative Zoology, Harvard University, Cambridge, MA 02138, USA. E-mail: p.naskrecki@conservation.org

Abstract

A new species of *Pseudosaga* (Tettigoniidae: Mecopodinae: Aprosphylini), *P. maraisi sp. n.* is described from Brandberg Massif in western Namibia. It differs from other members of the genus in the development of the male stridulatory structures and the female subgenital plate. A key for identification of all known species of *Pseudosaga* is provided.

Key words

katydid, Mecopodinae, Namibia, Pseudosaga, Africa, taxonomy, new species

Introduction

The genus *Pseudosaga* Brancsik was reviewed by Naskrecki (1993), who recognized 3 species known from Angola, Namibia, Republic of South Africa, and "Zambesi" (Zimbabwe?). The genus is a member of the tribe Aprosphylini (Mecopodinae), a group restricted in its distribution to southern Africa. Other members of the tribe include genera *Aprosphylus* Pictet, *Zitsikama* Peringuey, *Ewanella* Naskrecki, and the only cave-dwelling member of the family Tettigoniidae, *Cedarbergeniana* Naskrecki. They can be separated from other Mecopodinae by their unarmed prosternum, a lamelliform fastigium of vertex, a large, exposed thoracic auditory spiracle, and long, cylindrical styli in the male.

Members of the genus *Pseudosaga* are medium to large size katydids, fully winged, and with slender appendages. They differ from other members of Aprosphylini in the structure of the tympanal organs on the front tibia: while in other genera of the tribe the tympana are bilaterally open, in all species of *Pseudosaga* each tympanum is enclosed in a conchiform cuticular pocket. Coloration of all species of the genus is straw brown, with darker patches on the tegmina, pronotum, and legs. They are agile, nocturnal insects that feed on a variety of shrubby vegetation.

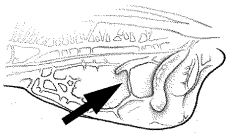
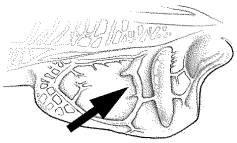
During a recent expedition to Brandberg Massif in western Namibia a new species of *Pseudosaga*, *P. maraisis sp. nov.*, was discovered, and the present paper includes its description, along with a tabular key for identification of all species of the genus (Table 1). Butlin (2000), who presented the first checklist of the Orthoptera of Brandberg, noted the common occurrence of *Pseudosaga maculata* (Karny) on these mountains at the elevation of 1200 m. In March 2002 *Pseudosaga* spp. were also found to be quite common on rocky slopes of Brandberg, at elevations of 1600-2000 m (individuals of *P. maculata* were considerably more frequent than those of the new species). Males of *P. maculata* produced loud calls that consisted of 1 to 2-s long bouts of stridulation, separated by about 500 ms of silence. The calls, which the insects started to produce around 8:30 PM, were clearly audible from a distance of about 500 m. An unfortunate loss of the recording equipment during the trip prevents the author from presenting here a formal analysis of the call of this species. The call of *P. maraisi* is unknown. Both species were occasionally attracted to UV light. Individuals of *P. maculata* have been collected also at much lower altitudes throughout Namibia and the northwestern portion of the Cape Province of South Africa (Naskrecki 1993), while *P. maraisi* should at this point be considered endemic to Brandberg.

The only other species of Tettigoniidae present on Brandberg in the habitat of *Pseudosaga* spp. were adults of *Clonia caudata* Uvarov, second and third instar nymphs of *Acanthoplus* sp., and first and second instar nymphs of an unidentified species of Phaneropterinae. Interestingly, the habitat of the new species of *Pseudosaga* is also one of few places where the newly discovered order of insects, the Mantophasmatodea, occurs (Zompro *et al.* 2003). The type specimens of *P. maraisi* are deposited in the collection of the National Museum of Namibia, Windhoek (NMNW).

Pseudosaga maraisi sp. nov.
(Figs 1b, 2c-f, 3c)

Differential diagnosis.— Body large for Tettigoniidae, slender; macropterous. Fastigium of vertex triangular with lamelliform apex. Tegmen exceeds tip of hind femur by about 1/5 of tegmen length; female subgenital plate with broad, triangular incision apically. Stridulatory file with 62 narrow, lamelliform teeth. This species is similar in general appearance to *P. maculata* (Figs 1a, b), with which it occurs sympatrically in Namibia. Males of these 2 species can be separated by 1) the larger body size and more slender appearance of *P. maraisi*, 2) the presence of a thick, strongly sclerotized auxiliary veinlet, parallel to the stridulatory file, and 3) the shape of the mirror (Figs 2b, c). Both sexes of the new species lack the inner apical spine on the hind tibia, which is present in *P. maculata*. From *P. angolensis* this species differs in a much larger body size and multiple characteristics of the male stridulatory organs, while

Table 1. Key for identification of species of *Pseudosaga*. Arrow indicates auxiliary vein.

Species	Apical spines on hind tibia	Female subgenital plate	Male left stridulatory area
angolensis	Inner spine present	Posterior margin straight	 Stridulatory file thicker
maculata	Inner spine present	Posterior margin straight to widely rounded	 Stridulatory file thicker
sphinx	Inner spine absent	Posterior margin with minute notch	? (male unknown)
maraisi	Inner spine absent	Posterior margin with large, triangular incision	 Stridulatory file thinner

from *P. sphinx*, a species known only from a female specimen and occurring along the Zambezi River, the new species differs in its proportionately longer tegmina and the presence of a deep, widely triangular incision of the female subgenital plate.

Description.— (holotype male except where specified)
Legs: Fore femur with 10 teeth on anterior ventral margin, posterior margin unarmed; middle femur with 10 to 12 teeth on anterior and 8 teeth on posterior margin; hind femur with 12 teeth on anterior and 10 teeth on posterior margin. All genicular lobes with 2 spines each. Only interior apical dorsal spine of hind tibia present.
Head: Fastigium of vertex elongately triangular as seen from above, its apex lamelliform.
Thorax: Pronotum smooth, faintly shining; disc cut by 3 shallow sulci; metazona slightly raised; when seen from above, posterior margin of metazona straight.
Tegmina: Tegmina surpassing hind knees by about 1/3 of their length; ratio length of tegmen/hind femur 1.58; marginal field of male tegmen distinctly expanded; costal vein bent, ending on anterior margin of tegmen. Stridulatory apparatus strongly projecting behind posterior margin of tegmen (Fig. 2c); stridulatory file weakly curved, its anterior part distinctly narrowed, with 62 narrow, lamelliform teeth; length of file 2.5 mm; stridulatory file accompanied by parallel, thick, auxiliary vein (possibly a branch of Cu1); mirror large, shaped like an obliquely cut oval; proximal margin of mirror straight, bordered by large, strongly sclerotized protuberance (a modified anal vein).
Genitalia: Tenth tergite not modified; supra-anal plate triangular, medially depressed; paraproct exceeding apex of supra-anal plate, with small tooth directed upwards. Cercus straight, styliform, with small subapical tooth; tip of cercus with small, tapered, tubercle bent downwards (Fig. 2f). Internal genitalia without sclerotized parts. Subgenital plate elongate, with deep triangular incision; styli long and slender, longer than cerci (Fig. 2e).
Female: Somewhat larger than male, with tegmina reaching beyond apex of ovipositor. Ovipositor narrow, weakly curved up; both lower and upper valvulae granulated at apex, lower valvula serrated in its apical 6th (Fig. 3c); ratio hind femur/ovipositor 1.3. Cercus straight, styliform, with acute apex. Subgenital plate longer than wide, its hind margin with deep triangular incision (Fig. 2d).

Color.— General coloration sandy brown, with dark brown maculation (Fig. 1b). All femora with broad, dark, weakly defined annuli. Outer surface of hind femur with faint reticulate pattern.

Measurements (mm). — Body (excluding tegmina and ovipositor): ♂ 40, ♀ 40; pronotum: ♂ 6.5, ♀ 6.5; tegmen: ♂ 63, ♀ 65; hind femur: ♂ 40, ♀ 46; ovipositor 35.

Material examined.— NAMIBIA: Swakopmund Distr., Brandberg, Mason Shelter, elev. 1730 m, lat 21° 9′ S, long 14° 35′ E, 5-12 March 2002 , coll. P. Naskrecki - 1 ♂ (holotype), 1 ♀ (allotype) (NMNW).

Etymology.— Named in honor of Dr. Eugene Marais of the National Museum of Namibia in Windhoek for his contributions to African entomology and exploration of southern African biota.

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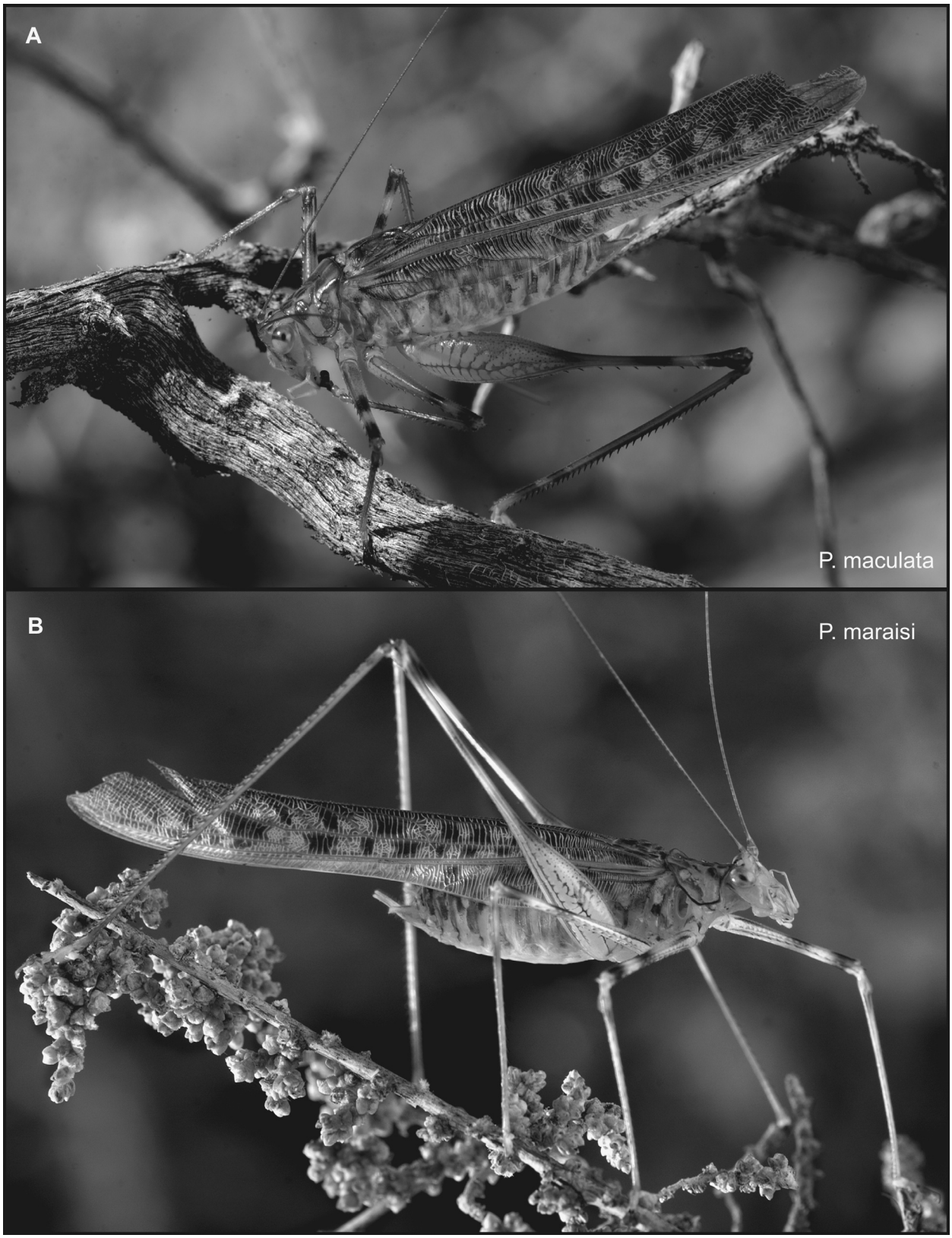

Fig. 1. Males of *Pseudosaga* spp. photographed on Brandberg, Namibia: (A) *P. maculata* Karny; (B) *P. maraisi sp. n*. (holotype).

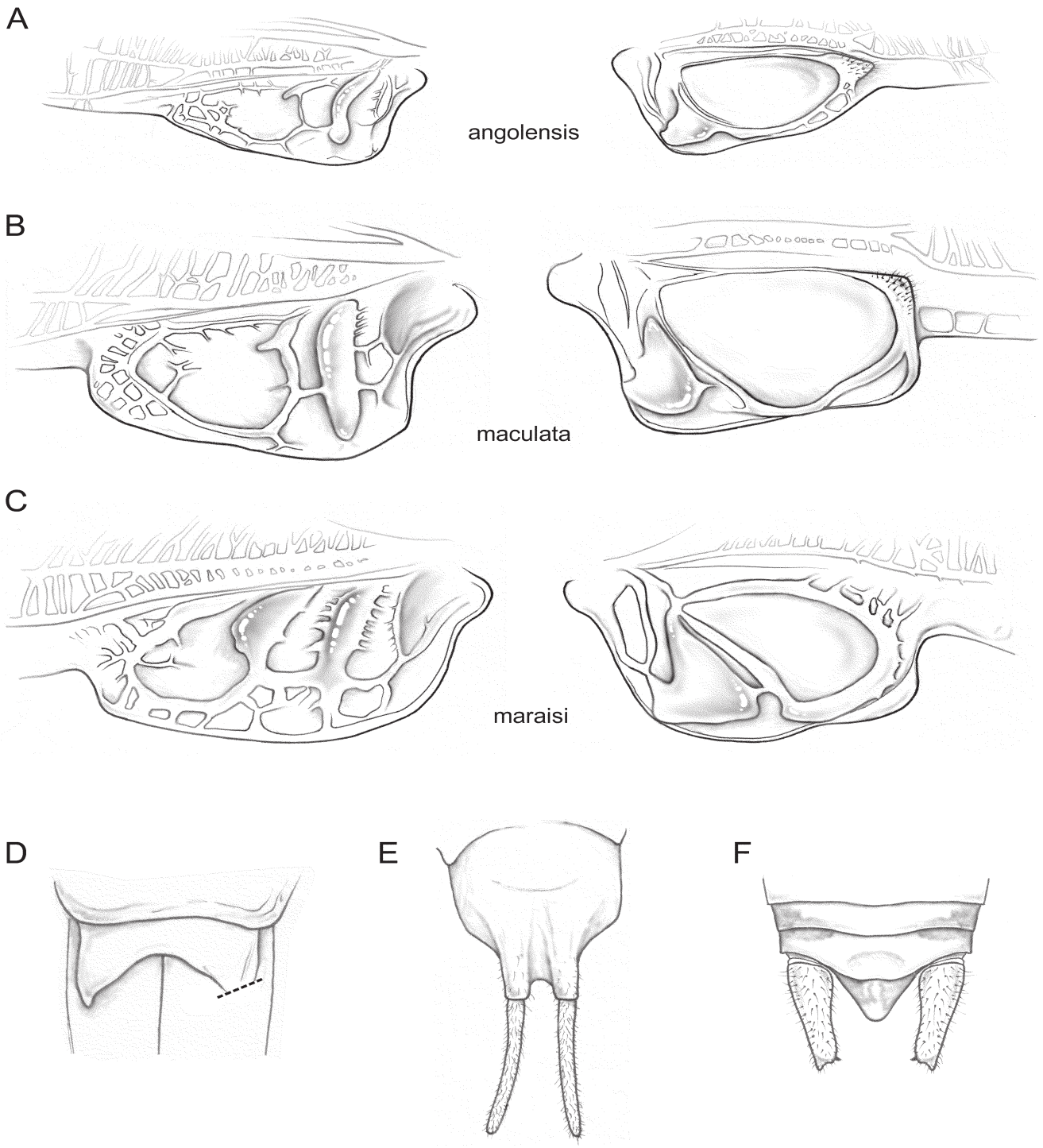

Fig. 2. Diagnostic characters of *Pseudosaga* spp.: (A) *P. angolensis*: male stridulatory area; (B) *P. maculata*: male stridulatory area; (C-F) *P. maraisi*: (C) male stridulatory area; (D) female subgenital plate; (E) male subgenital plate; (F) male cerci and supra-anal plate.

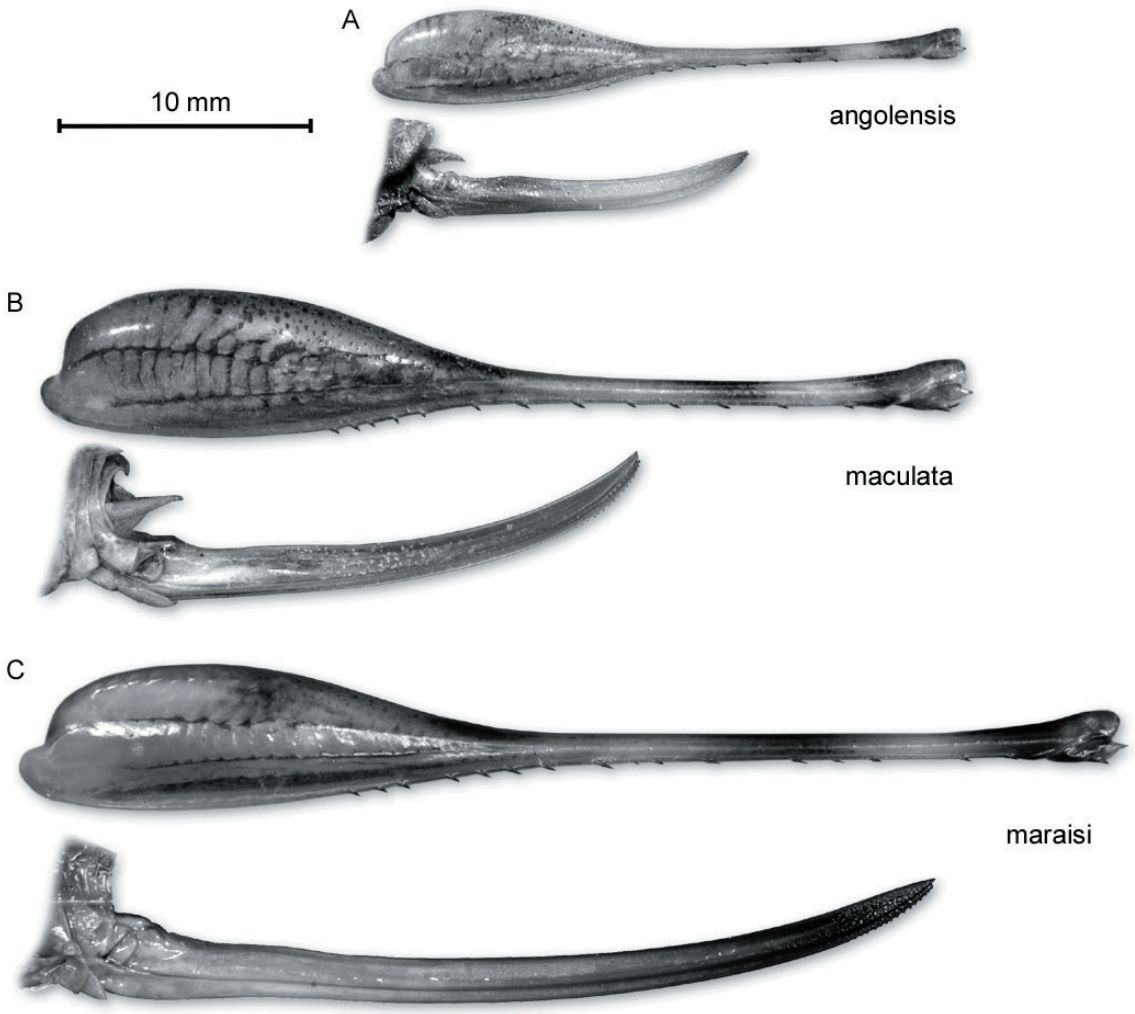

Fig. 3. Hind femora and ovipositors of *Pseudosaga* spp. females: (A) *P. angolensis;* (B) *P. maculata;* (C) *P. maraisi.*