

Notes on Namibian *Mantophasma* Zompro, Klass, Kristensen & Adis, 2002, with descriptions of three new species (Insecta: Mantophasmatodea: Mantophasmatidae: Mantophasmatini)

Заметки о намибийских *Mantophasma* Zompro, Klass, Kristensen & Adis, 2002 с описаниями трёх новых видов (Insecta: Mantophasmatodea: Mantophasmatidae: Mantophasmatini)

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КЛЮЧЕВЫЕ СЛОВА: Mantophasmatodea, *Mantophasma*, новые виды, Намибия.

ABSTRACT. Three new species of *Mantophasma* are described from mountain ranges in Namibia: *M. gamsbergense* sp.n., *M. kudubergense* sp.n. and *M. omatakoense* sp.n. In addition, *Sclerophasma paretensis* Klass et al., 2003, is transferred to *Mantophasma* comb.n.

РЕЗЮМЕ. Описываются три новых вида *Mantophasma* из горных хребтов Намибии: *M. gamsbergense* sp.n., *M. kudubergense* sp.n. и *M. omatakoense* sp.n. Кроме того, вид *Sclerophasma paretensis* Klass et al., 2003 впервые переведён в состав рода *Mantophasma* comb.n.

Introduction

The insect order Mantophasmatodea Zompro et al. was described as recently as 2002. The description was initially based on a species from Baltic amber (*Raptophasma kerneggeri* Zompro, 2001), followed by specimens traced in museums. Afterwards several species have been collected in southern Africa [Zompro et al., 2002, 2003; Klass et al., 2003], resulting in a rapid increase in species descriptions. The inter- and intraordinal relationships have been analysed by Zompro [2005], with the result that the families established by Klass et al. [2003] could be synonymised with a tribe and a genus, respectively. A synonymic checklist is presented below.

It becomes increasingly obvious that eventually every southern African mountain range supports its own endemic species. Therefore exact collecting data are helpful for correct identifications. Three new species of *Mantophasma* Zompro, Klass, Kristensen & Adis, 2002 are described here, all from Namibia.

Synonymic checklist of Mantophasmatodea (valid taxa boldface)

†**Ensiferophasmatidae** Zompro, 2005

†*Ensiferophasma* Zompro, 2005

Mantophasmatidae Zompro et al., 2002

†**Raptophasmatinae** Zompro, 2005

†**Raptophasmatini** Zompro, 2005

†*Raptophasma* Zompro, 2001

(= †*Adicophasma* Engel & Grimaldi, 2004, synonymised by Zompro [2005])

†*Raptophasma kerneggeri* Zompro, 2001

(= †*Adicophasma spinosa* Engel & Grimaldi, 2004, synonymised by Zompro [2005])

Mantophasmatinae Zompro et al., 2002

Mantophasmatini Zompro et al., 2002

(= Austrophasmatidae Klass et al., 2003: Zompro [2005])

Mantophasma Zompro et al., 2002

(= *Austrophasma* Klass et al., 2003; = *Sclerophasma* Klass et al., 2003; = *Tanzaniophasmatidae* Klass et al., 2003; = *Tanzaniophasma* Klass et al., 2003, all synonymised by Zompro [2005]).

Mantophasma gamsbergense Zompro & Adis sp.n.

Mantophasma kudubergense Zompro & Adis sp.n.

Mantophasma omatakoense Zompro & Adis sp.n.

Mantophasma subsolana Zompro et al., 2002

Mantophasma zephyra Zompro et al., 2002

Tyrannophasmatini Zompro, 2005

Tyrannophasma Zompro, 2003

T. gladiator Zompro, 2003

Praedatophasma Zompro & Adis, 2002

P. maraisi Zompro & Adis, 2002

Mantophasmatini incertae sedis

The following taxa are either insufficiently documented or too poorly described so that at present their taxonomic position cannot be defined.

Austrophasma caledonensis Klass et al., 2003
Austrophasma gamsbaaiensis Klass et al., 2003
Austrophasma rawsonvillensis Klass et al., 2003
Hemilobophasma Klass et al., 2003
Hemilobophasma montaguensis Klass et al., 2003
Karoophasma Klass et al., 2003
Karoophasma biedouwensis Klass et al., 2003
Karoophasma botterkloofensis Klass et al., 2003
Lobophasma Klass et al., 2003. Preoccupied by
Lobophasma Günther, 1935 (Phasmatoidea).
Lobophasma redelinghuysensis Klass et al., 2003
Namaquaphasma Klass et al., 2003
Namaquaphasma ookiepensis Klass et al., 2003

Materials and methods

The material described below was collected by various persons in Namibia. It is preserved in 96% ethanol. The examinations were executed using a Zeiss-Citaval-2 stereoscope, while the drawings prepared by means of an attached drawing tube. Measurements were taken with an MBC-9 stereoscope and a scale ocular.

Taxonomic part

Mantophasma

Zompro, Klass, Kristensen & Adis, 2002

TYPE SPECIES: *Mantophasma zephyra* Zompro, Klass, Kristensen & Adis, 2002, by original designation.

Mantophasma Zompro, Klass, Kristensen & Adis, 2002: 1456; Zompro, Adis & Weitschat, 2002: 275; Klass, Picker, Damgaard, Van Noort & Tojo, 2003: 50; Zompro, 2005: 101. = *Austrophasma* Klass, Picker, Damgaard, Van Noort & Tojo, 2003: 27
 = *Sclerophasma* Klass, Picker, Damgaard, Van Noort & Tojo, 2003: 50
 = *Tanzaniophasmatidae* Klass, Picker, Damgaard, Van Noort & Tojo, 2003: 51
 = *Tanzaniophasma* Klass, Picker, Damgaard, Van Noort & Tojo, 2003: 51, all synonymised by Zompro [2005: 101].

DIAGNOSIS. The diagnosis presented here defines the subgenus *Mantophasma*. Both *Austrophasma* and *Tanzaniophasma* possibly represent valid subgenera.

General coloration of living specimens green or light brown, possibly also spotted, thoracic nota with a yellow to whitish stripe laterally. Body and femora smooth, without granulae, tubercles or definite spines. Legs in males reddish brown, in females coloured as body. Eyes comparatively small. Pronotum rectangular, longer than wide. Exterovenral carinae of pro- and mesofemora as well as pro- and mesotibiae spinose. Protibiae with small spines or tubercles dorsally, these much smaller or absent on mesotibiae. Mid- end hindlegs smooth, sometimes with very small spines on exteroventral carinae of femora. Male vomer broad, without acute apex. Male cerci broad, flattened, at least slightly curved inwards.

SPECIES INCLUDED: Five species of the subgenus *Mantophasma* occur in Namibia: *M. gamsbergense* sp.n.,

M. kudubergense sp.n., *M. omatakoense* sp.n. and *M. zephyrum* Zompro et al., 2002. In addition, *M. paresisense* (Klass et al., 2003) is tentatively included. Given so few morphological differences, it remains open to question if these taxa represent species or subspecies. Considering the geographical separation, we decided to treat them as species. Their differences lie mainly in body size and in structure of the genitalia. To avoid unnecessary repetitions, the descriptions are reduced to diagnostic characters.

Mantophasma gamsbergense Zompro & Adis sp.n.

Figs 4, 6.

MATERIAL: 4 ♀♀. Holotype, ♀, paratypes, 3 ♀♀: Namibia, Windhoek District, Gamsberg, southern slope, 2208 m, S23°20'50.4" E16°13'34.6", with sweepnet, 25.III.2006, leg. T.L. Bird. Holotype and 2 paratypes in the Namibian National Insect Collection, National Museum, Windhoek, Namibia, one paratype in the Zoologisches Museum der Christian-Albrecht-Universität, Kiel, Germany (all in ethanol).

DIAGNOSIS: Female. Small species. Green, pattern as in Fig. 6, possibly with darker stripes on back and a lighter abdomen when alive. Abdominal tergite X almost evenly rounded posteriorly. IX about two-thirds as long as X. Sternite VII strikingly long, projecting beyond middle of tergite IX. Sternite VI with two flat elevations posterosubmedially. These elevations are absent from the much larger *M. kudubergense* sp.n.

Lengths (mm): Total: 12.1–13.1; head: 1.4–1.5, width: 2.3–2.4; eye (l×h): 1.0×0.4–1.1×0.4; antennae: 11.4–12.2; pronotum: 2.0–2.2, width: 2.0–2.1; mesonotum: 1.9–2.0, width: 1.8–1.9; metanotum: 1.7–1.9, width: 1.2–1.6; profemora: 3.1–3.5; protibiae: 3.2–3.9; protarsi: 1.1–1.3; mesofemora: 3.0–3.5; mesotibiae: 2.9–3.4; mesotarsi: 1.0–1.1; metafemora: 4.7–5.2; metatibiae: 5.5–5.9; metatarsi: 1.2–1.6.

NAME: After the type locality.

Mantophasma kudubergense Zompro & Adis sp.n.

Figs 2–3, 7–8, 10, 12.

(cf. figs 18–19 in Zompro et al. [2003]).

Mantophasma zephyra Adis, Zompro, Moombolah-Goagoses & Marais, 2002: 64; Dallai, Frati, Lupetti & Adis, 2003: 67; Zompro, Adis, Bragg, Naskrecki, Meakin, Wittneben & Saxe, 2003: 21.

MATERIAL: 8 ♂♂, 7 ♀♀. Holotype, ♂, paratypes, 7 ♂♂ and 7 ♀♀: Namibia, Erongo Prov., Erongo Mts., Kuduberg, Mosich Farm, S21°40'42" E015°45'32", 1550m, 04.IV.2002, leg. E. Marais (four paratypes elevated from nymphs by J. Adis, Plön). In the Namibian National Insect Collection, National Museum, Windhoek, Namibia. One pair of paratypes in the Zoologisches Museum der Christian-Albrecht-Universität, Kiel, Germany (all in ethanol).

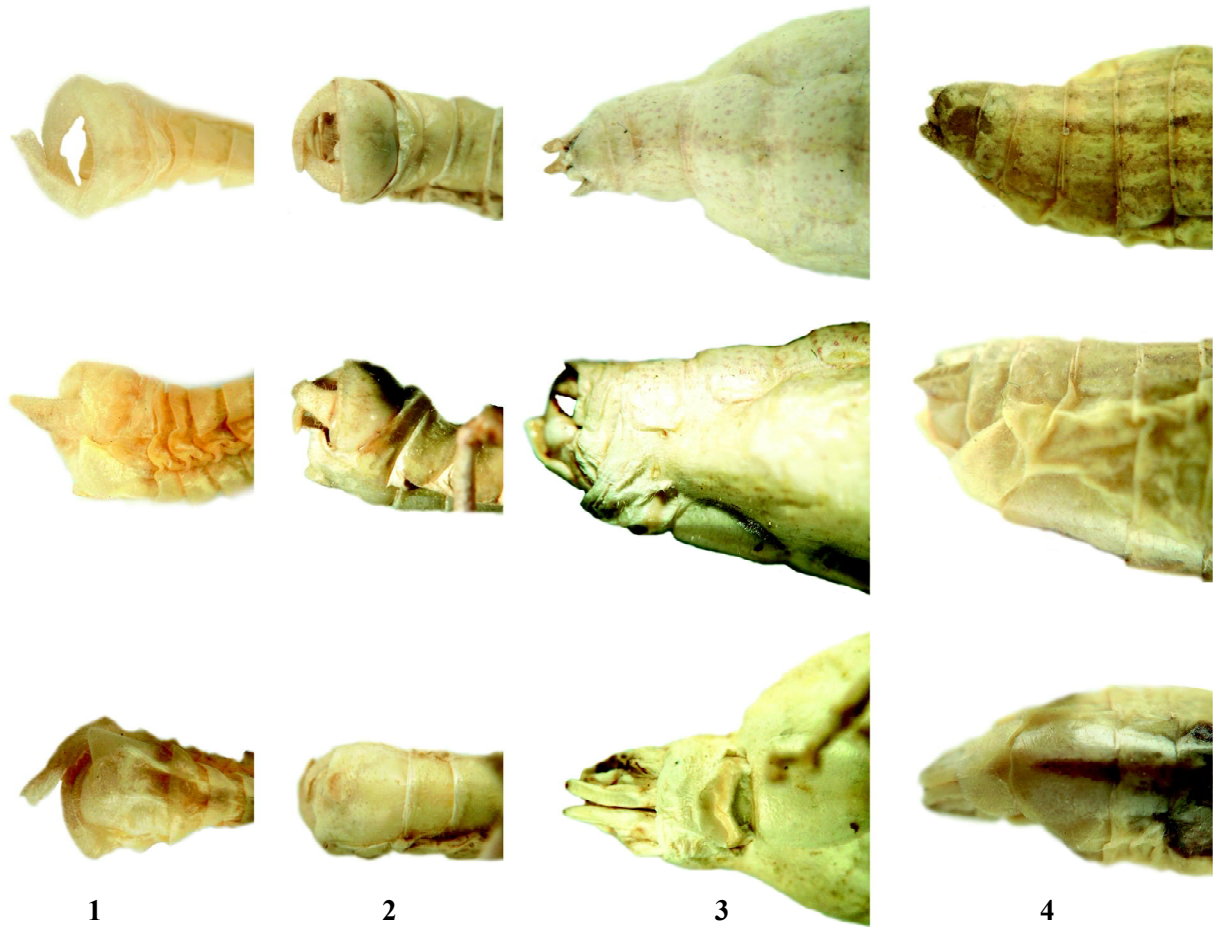
DIAGNOSIS. When alive, colouration typical for subgenus *Mantophasma*. Eye with a longitudinal red stripe in dorsal half. In ethanol light yellow.

Male. Abdominal tergite X broad, slightly globose, almost straight subrectangular. Vomer subrectangular, left quarter folded anteriorly at a right angle. A triangular process present below this fold. Folded part slightly projecting in apical corner. Cerci slightly compressed basally and strongly flattened apically, with a simple apex.

Female. Abdominal tergite X evenly rounded posteriorly, IX half as long. Sternite only slightly projecting beyond anterior margin of tergite IX.

Lengths (mm), ♂♂: Total: 12.1–15.4; head: 1.1–1.4, width: 2.2–2.4; eye (l×h): 1.0×0.45–1.1×0.6; antennae: 11.2–13.8; pronotum: 2.4–2.5, width: 2.0–2.1; mesonotum: 1.9–2.1, width: 1.9–2.1; metanotum: 1.6–1.7, width: 1.7–1.8;

Notes on Namibian *Mantophasma*



Figs 1–4. Terminal abdominal segments — dorsal, lateral and ventral views (without scale): 1 — *Mantophasma omatakoense* sp.n., ♂; 2 — *Mantophasma kudubergense* sp.n., ♂; 3 — *Mantophasma kudubergense* sp.n., ♀; 4 — *Mantophasma gamsbergense* sp.n., ♀. © O. Zompro.

Рис. 1–4. Последние сегменты брюшка — сверху, сбоку и снизу (без масштаба): 1 — *Mantophasma omatakoense* sp.n., ♂; 2 — *Mantophasma kudubergense* sp.n., ♂; 3 — *Mantophasma kudubergense* sp.n., ♀; 4 — *Mantophasma gamsbergense* sp.n., ♀. © O. Zompro.



Fig. 5. *Mantophasma omatakoense* sp.n., holotype, ♂. © C. Grohmann.
Рис. 5. *Mantophasma omatakoense* sp.n., голотип, ♂. © C. Grohmann.



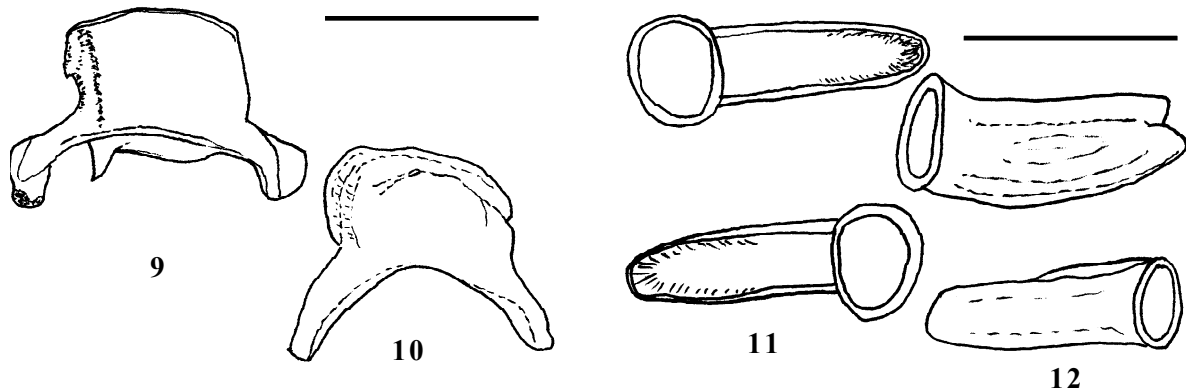
Fig. 6. *Mantophasma gamsbergense* sp.n., holotype, ♀. © J. Adis.
Рис. 6. *Mantophasma gamsbergense* sp.n., голотип, ♀. © J. Adis.



Fig. 7. *Mantophasma kudubergense* sp.n., ♀. © O. Zompro.
Рис. 7. *Mantophasma kudubergense* sp.n., ♀. © O. Zompro.



Fig. 8. Habitat of *Mantophasma kudubergense* sp.n. at Kuduberg. © T. Kujawski / ASA-Multimedia, Flintbek, Germany (kujawski@asa-multimedia.de).
Рис. 8. Местообитание *Mantophasma kudubergense* sp.n. у Кудуберга. © T. Kujawski / ASA-Multimedia, Flintbek, Germany (kujawski@asa-multimedia.de).



Figs 9–10. Male vomer: 9 — *Mantophasma omatakoense* sp.n.; 10 — *Mantophasma kudubergense* sp.n. Scale bar — 1 mm. © O. Zompro.

Рис. 9–10. Вомер самца: 9 — *Mantophasma omatakoense* sp.n.; 10 — *Mantophasma kudubergense* sp.n. Масштаб — 1 мм. © O. Zompro.

Fig. 11–12. Male cerci: 11 — *Mantophasma omatakoense* sp.n.; 12 — *Mantophasma kudubergense* sp.n.; top — right, bottom — left. Scale bar — 1 mm. © O. Zompro.

Рис. 11–12. Церки самца: 11 — *Mantophasma omatakoense* sp.n.; 12 — *Mantophasma kudubergense* sp.n.; вверху — справа; внизу: слева. Масштаб — 1 мм. © O. Zompro.

profemora: 3.3–3.5; protibiae: 3.5–3.7; protarsi: 1.1–1.2; mesofemora: 2.9–3.1; mesotibiae: 3.7–3.9; mesotarsi: 1.0–1.2; metafemora: 4.5–5.0; metatibiae: 5.3–5.6; metatarsi: 1.2–1.4.

Lengths (mm), ♀♀: Total: 16.3–21.3; head: 1.3–1.5, width: 2.6–2.8; eye (l×h): 1.0×0.5–1.3×0.6; antennae: 14.9–19.9; pronotum: 2.6–2.8, width: 2.4–2.6; mesonotum: 2.5–2.6, width: 2.1–2.3; metanotum: 1.6–2.1, width: 2.1–2.3; profemora: 4.1–4.2; protibiae: 4.3–4.5; protarsi: 1.5–1.7; mesofemora: 3.2–3.3; mesotibiae: 3.3–3.5; mesotarsi: 1.4–1.7; metafemora: 5.2–5.3; metatibiae: 6.1–6.6; metatarsi: 1.4–1.6.

NAME: After the type locality.

Mantophasma omatakoense Zompro & Adis sp.n.

Figs 1, 5, 9, 11.

MATERIAL: Holotype, ♂ (in ethanol): Omatako-Farm between Otjiwarongo and Okahandja, S21°20.72' E16°43.92', 10.IV.2005, on backpack, leg. C. Grohmann. In the Namibian National Insect Collection, National Museum, Windhoek, Namibia.

DIAGNOSIS: Mantophasmatini. Male. Body green, thorax with whitish yellow margins, legs violet, knees green. Eye with a violet longitudinal stripe in dorsal half. Abdominal tergite X broadened posteriad, broadly emarginate posteriorly. Cerci broad and flat. Right one slightly bifurcate, apex of left one simple. Male vomer subrectangular, left fifth folded anteriorly. Dorsal margin slightly bent anteriorly. Arms broad and simple.

Lengths (mm): Total: 12.4; head: 1.4, width: 2.3; eye (l×h): 0.9×0.45; antennae: 11.1; pronotum: 2.2, width: 1.5; mesonotum: 2.0, width: 2.0; metanotum: 0.8, width: 1.7; profemora: 3.9; protibiae: 4.4; protarsi: 1.1; mesofemora: 3.6; mesotibiae: 3.5; mesotarsi: 1.3; metafemora: 5.6; metatibiae: 6.2; metatarsi: 1.1.

Female unknown.

NAME: After the type locality.

Mantophasma paresisense (Klass, Picker, Damgaard, Van Noort & Tojo, 2003), **comb.n.**

Sclerophasma paresisense Klass, Picker, Damgaard, Van Noort & Tojo, 2003: 50, figs 4K, 22–23.

MATERIAL: This species could only be re-evaluated based on the brief and incomplete original description.

DIAGNOSIS: Male 16.6 mm, female 16.8 mm. This species was described from Namibia, Paresisberg, Otjiwarango District, S20°36' E16°28'. The shape of the male vomer suggests that it represents a species of *Mantophasma*. This is also supported by distribution. The small difference in the sizes of both sexes seems to indicate that the female paratypes could be nymphs. Adult females would presumably measure about 20 mm. The male vomer lacks the triangular process present in *M. kudubergense* sp.n., while *M. omatakoense* sp.n. differs by the more strongly emarginate abdominal tergite X and in shape of the male vomer.

Mantophasma zephyrum Zompro, Klass, Kristensen & Adis, 2002

Mantophasma zephyra Zompro, Klass, Kristensen & Adis, 2002: 1456 — Zompro, Adis, & Weitschat, 2002: 276; Zompro, 2002: 370; Klass, Picker, Damgaard, Van Noort & Tojo, 2003: 50.

Non *Mantophasma zephyra* Adis, Zompro, Moombolah-Goagoses & Marais, 2002: 64; Dallai, Frati, Lupetti & Adis, 2003: 67; Zompro, Adis, Bragg, Naskrecki, Meakin, Witteben & Saxe, 2003: 21 (described above as *Mantophasma kudubergense* sp.n.).

MATERIAL: Holotype, ♀ (in ethanol): D. S. W. Afr. S. G. Seewald 'JR. No. 827/09' (Zoologisches Museum Berlin). Presumably collected in northern Namibia, where Seewald worked.

The type species of *Mantophasma* was described from a single ♀ (23.6 mm) with comparatively imprecise collecting data. For further work on *Mantophasma*, more material and, especially, males of this species are required. *M. zephyrum* differs from the other Namibian congeners by the very short abdominal tergite X, which is only slightly longer than IX.

Discussion

The Recent species of *Mantophasma* inhabit the southern half of Africa. They mainly occur in the mountains, apparently every mountain range supporting endemic congeners. The species differ in minor details of genitalic structure, this being evidence of separation/isolation in a not too distant past. It is easy to

predict that several more species will be found in future when other mountainous regions become prospected.

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