

Morphological variability study and review of the distribution area of *Metaegosoma annamensis* (Pic, 1930) (Coleoptera, Cerambycidae, Prioninae)

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Summary

A large number of specimens of the Vietnamese species *Metaegosoma annamensis* (Pic, 1930) were examined as part of this study in order to characterize the variability of the species from the point of view of size, coloration and other morphological characteristics. The possibility of the existence of speciation in the populations of *M. annamensis* studied was also assessed. A new distribution map for the species is presented.

Résumé

Un grand nombre de spécimens de l'espèce vietnamienne *Metaegosoma annamensis* (Pic, 1930) ont été examinés dans le cadre de cette étude afin de caractériser la variabilité de l'espèce tant du point de vue taille, coloration et autres caractères morphologiques. La possibilité de l'existence d'une spéciation au sein des populations de *M. annamensis* étudiées a également été évaluée. Une nouvelle carte de distribution pour l'espèce est présentée.

Key words: Coleoptera, Cerambycidae, Prioninae, Vietnam, *Metaegosoma*.

Introduction

The vast Aegosomatini tribe includes the very interesting genus *Metaegosoma* erected by KOMIYA AND DRUMONT in 2012 in order to integrate two species showing common morphological characteristics distinguishing them from the *Aegosoma* group: *Megopis (Aegosoma) pici* Lameere, 1915 (type-species of the *Metaegosoma* genus) and *Megopis annamensis* Pic, 1930.

While *Metaegosoma pici* shows relative stability in its habitus and has a range limited up to now to two Chinese provinces (Guizhou and Yunnan, cf. DRUMONT & KOMIYA, 2020), its Vietnamese counterpart, *M. annamensis*, shows great variability in size and colour with a distribution area extending over most of the Vietnamese central part territory. This latter one was described by PIC (1930) on a single female mentioned from “Annam” without further information. KOMIYA & DRUMONT (2012) mentioned *M. annamensis* from the Lam Dong province in southern part of Vietnam. Recently, we were able to examine a large set of males and females from this species coming from different provinces of Vietnam.

The objective of this study was to analyse the variability exhibiting by this species in color, size and morphological characters, as well as to better define its distribution in Vietnam. Finally, we will verify if this variability may hide a possible speciation within the species *M. annamensis*.

***Metaegosoma annamensis* Pic, 1930 (figs 1, 2, 3 & 4)**

Megopis annamensis Pic, 1930, Mél . exot.–ent., (55), p. 15.

Megopis annamensis Komiya, 2000, Elytra, 28(2), p. 423.

Metaegosoma annamensis Komiya & Drumont, 2012, Elytra, new series 2((2)), p. 185.

Material and method

All specimens were mounted and thoroughly examined with a binocular magnifier 20/40X for a detailed morphological comparison.

In order to take into account the objectives of this study, the selection criteria had to allow on the one hand to define the general variability of the species and on the other hand to demonstrate the presence (or not) of a speciation in a given population.

For this reason, in addition to the morphological characteristics that are inherent to variability such as size and colour, the comparison tables include more precise criteria (identical on all tables) concerning for example the antennal characteristics, the shape of the mandibles, the pronotum, the elytra, and other characteristics that could lead to segregation with respect to the original diagnosis.

Each population was first analysed separately (see tables by province pages 5-8) and then a global synthesis was made to conclude on the morphological differences observed.

The < / > signs indicate a different size than the one indicated in the character definition in the left-hand column.

The number "0" indicates that the result does not match the character definition in the left column.

Body length (size) is measured from the tip of the mandible to the elytral apex.

All macro-photographs were taken with a Konica Minolta Dimage Z6 12X camera.

The following collections have served as basis for this study :

ADC: collection of Alain DRUMONT, Brussels, Belgium.

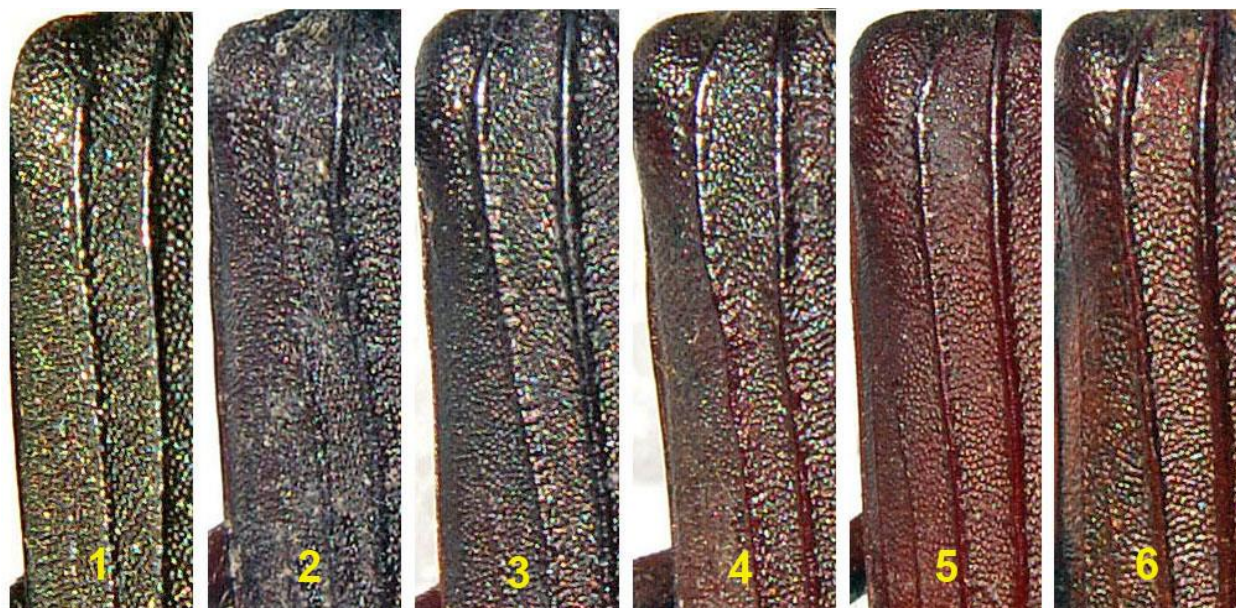
CRC: collection Claude RIPAILLE, Lias, France.

RBINS: Royal Belgian Institute of Natural Sciences, Brussels, Belgium.

STC: collection of Sergi Trocoli, Barcelona, Spain.

The material studied is as follow: *Reference material studied.* – As the Pic's holotype has not been able to be located, instead of designate neotype, KOMIYA & DRUMONT (2012) has deposited a reference pair in the RBINS: 1♀, 29 mm, with two labels attached "Mt. Bao Loc, Lam Dong prov. Vietnam, 29–VI–1–V–1999.", "*Metaegosoma annamensis* (Pic, 1930), ♀, det. by Komiya & Drumont, 2011". This specimen was used as the standard of this species for the paper by KOMIYA & DRUMONT (2012). 1♂, 29mm male with same data was also deposited in RBINS at the same time. *Other material studied.* – 9 ♂♂, Vietnam, Kon Tum prov., Mt Ngoc Linh, 1700-1900m, V.2017 (ADC); 2 ♂♂, Vietnam, Kon Tum prov., Mt Ngoc Linh, 1700-1900m, II.2017 (ADC); 3 ♂♂, Vietnam, Lam Dong prov., Di Linh, IV.2017 (ADC); 1 ♀, same data (ADC); (ADC); 2 ♂♂, Vietnam, Lam Dong prov., Di Linh, IV.2015 (ADC); 2 ♀♀, same data (ADC); 1 ♂, Vietnam, Lam Dong prov., Di Linh, IV.2016 (ADC); 1 ♀, same data (ADC); 1 ♂, Vietnam, Lam Dong prov., Di Linh, V.2015 (CRC); 1 ♀, Vietnam, Lam Dong prov., Di Linh, IV.2017 (CRC); 1 ♀, Vietnam, Lam Dong prov., Bi Doup Nui Ba N.P, V.2017 (CRC); 2 ♂♂, Vietnam, Quang Nam prov., Tay Giang, Mt Axan, 1300m, III.2018 (ADC); 4 ♂♂, Vietnam, Quang Nam prov., Tay Giang, 1300m, IV.2017 (ADC); 2 ♂♂, Vietnam, Quang Nam prov., Tay Giang, Mt Axan, 1300m, IV.2017 (CRC); 1 ♂, Vietnam, Quang Nam prov., Tay Giang, Mt Axan, 1300m, III.2018 (CRC); 1 ♂, Vietnam, Dak Lak prov., V.2018 (ADC); 1 ♀, same data (ADC); 1 ♂, Vietnam, env. Hoa Son, Dak Lak prov., IV.2017 (ADC); 1 ♀, Vietnam, Thua Tien Hue, Mt Bach Ma, 1400m, VIII.2016 (ADC); 1 ♂, Vietnam, Kon Tum prov., VII.2012, ref. 10894 (STC).

Results



Color samples (left elytra). – The elytral colouring is very variable inside the set studied and varies from dark grey to brown or ash black in males, and to reddish-brown to dark brown in females; with intermediate shades and a satin-like appearance.

- 1) > male / Dak Lak prov. ;
- 2) > male / Kon Tum prov.
- 3) > male / Lam Dong / Quang Nam prov.
- 4) > male / Quang Nam prov.
- 5) > females / all populations
- 6) > female / Thua Thien Hue prov.

Variability in size. – This large set of *M. annamensis* demonstrate us that this insect exhibits a great variability in size. We have recorded for males: 27 to 39 mm with 32.8mm on average, and for females: 30 to 43 mm with 35mm on average (KOMIYA & DRUMONT (2012) noted 27-33 mm for males and 28-34 mm for females). Holotype female by PIC (1930) was 30 mm long, so a rather small specimen in comparison with the female length ranging from 28 to 43 mm. The only noticeable difference could come from the average size of the Dak-Lak population, which seems to be much smaller than in the other collection areas. It remains to be demonstrated on a larger number of specimens but it enters inside the size variability already observed by PIC (1930) and KOMIYA & DRUMONT (2012).

Average size table

<i>locality</i>	<i>average size</i>	
	<i>m</i>	<i>f</i>
Lam Dong / Di Linh	36	35,6
Quang Nam / Tay Giang / Mt Axan	33,2	
Kon Tum / Mt Ngoc linh	31,3	
Dak Lak	27,5	33
Bach Ma N.P.		33
<i>global average</i>	32	33,8

Morphological variations. – The mandibles mostly have an outer lateral border consisting of two almost straight planes in the first two thirds extended by a regular curve in the last third. Nevertheless, some specimens have a border with a sharp hump at half the length and then a curve towards the apex while others have a regular curve along the whole length.

The indented eyes have an upper lobe much smaller than the lower lobe (about one third) and the interocular spacing corresponds approximately to the lower edge of the scape. Only one individual (Lam Dong / large female) escapes this rule with a smaller interval (this may be related to the size of the insect).

The antennae reach the level of the elytral apex in males, whereas in females they do not exceed 4/5ths of this length. However, many males have antennae that do not reach the apex while some exceed the elytra by about one antennae article. KOMIYA & DRUMONT (2012) noted a ratio antenna length/body length of 0.9-1.1 for males and 0.7-0.9 for females. All the specimens have the 3rd antennal article of a length equal to almost twice that of the 4th (ratio: 0.48) except two specimens (Lam Dong / 2 females) with this length is slightly longer.

The pronotum is very homogeneous in morphological characteristics between specimens with a cordiform bulge in the disc which is rather stable in shape and a little less "swollen" in some individuals. Scattered hairiness is regular and identical in all specimens.

The elytra present four distinct and darker ribs, the first one joining the second at $\frac{3}{4}$ in length and the 3rd and 4th joining the second one just before the elytral apex. Here again, there are a few specimens showing a variation with the first rib not joining the second one. The apex of all individuals is at least angular with most of them having a more or less sharp spine.

No noticeable difference on the legs as well as on the ventral level apart from a few variations on the shape of the prosternal process (more or less widened at the apex).

Conclusion on the variability studied. – Based on the large set of specimens studied and in spite of some inconsistent morphological variations, there is no significative element to define or envisage possible speciation in this species.

Occurrence period. – The period of activity extends mainly from March to June with exceptionally appearances in July until August.

Distribution. – The original description of *Metaegosoma annamensis* mentions only "Annam" as type-locality for the species. KOMIYA & DRUMONT (2012) quoted the species from Lam Dong province of southern Vietnam. We presented (page 9) a distribution map based on specimens studied in this note. *M. annamensis* is currently known from five provinces in central and southern parts of Vietnam: Lam Dong, Quang Nam, Kon Tum, Dak Lak and Thua Thien Hue. This repartition in Vietnam suggests that *M. annamensis* can also occur in south-eastern part of Laos. On the basis of current data, the green area tentatively corresponds to the presumed limits of the range of this species.

Plates:

Fig. 1: *Metaegosoma annamensis* (left to right) ♂, 37 mm ; ♀, 43 mm ; ♂, 39 mm (all from Vietnam, Lam dong, in ADC).

Fig. 2: *Metaegosoma annamensis* (left to right) ♂, 38 mm ; ♂, 35 mm (all from Vietnam, Quang Nam, in ADC).

Fig. 3: *Metaegosoma annamensis* (left to right) ♂, 33 mm ; ♂, 32 mm (all from Vietnam, Kon Tum, in ADC).

Fig. 4: *Metaegosoma annamensis* (left to right) ♂, 27 mm (Vietnam, Dak Lak, in ADC); ♀, 33 mm (idem in ADC); ♀, 33 mm (Vietnam, Thua Thien Hue, in ADC).

(Photos and arrangement: C. RIPAILLE).

Overview table for Lam Dong specimens:

morphological characteristics		Di Linh / Lam Dong											moy.		
A) Size	m:	35	39	33			38	35	37	35					36
	f:				43	38	34		37				30	32	35,6
B) head:															
> eyes															
upper lobe small (1/3 of the lower one)		X	X	X	X	X	X	X	X	X	X	X	X	X	X
interocular space equal to the lower edge of the scape		X	X	X	<	X	X	X	X	X	X	X	X	X	X
> mandibles															
outer edge angular at one third and two thirds		X	X	X	X	X		X		X			X		X
outer edge with a mid-length bump							X							X	
outer edge evenly rounded								X			X				
C) antennae:															
length:															
> reaches the elytral apex		X	X	X				X			X	X	X	X	X
> exceeds the elytral apex															
> below the elytral apex					X	X	X		X	X					
art.3 equal to almost twice the length of the 4th (0.48)		X	X	X	>	X	X	X	>	X	X	X	X	X	X
art. 5 to 10 with widened apex, angular inner side.		X	X	X	X	X	X	X	X	X	X	X	X	X	X
D) pronotum:															
subquadrangular, height = approx. 2/3 of the width (0.59)		X	X	X	X	X	X	X	X	X	X	X	X	X	X
post. edge wider than front edge		X	X	X	X	X	X	X	X	X	X	X	X	X	X
enlarged cordiform bulge in the centre		X	X	X	X	X	X	X	X	X	X	X	X	X	X
slightly swollen disc															
sparse golden or whitish hairiness		X	X	X	X	X	X	X	X	X	X	X	X	X	X
E) elytrae:															
colour:															
> grey-black satin finish			X	X				X							X
> grey-brown satin		X								X			X	X	
> satin brown											X				
ribs: 4 clear and darker ribs		X	X	X	X	X	X	X	X	X	X	X	X	X	X
the first joining the second at 3/4 of the length		X	X	X	X	X	X	X	X	X	X	X	X	X	X
the 3rd and 4th joining the second before the elytral apex		X	X	X	X	X	X	X	X	X	X	X	X	X	X
angular apex or with a short spine		X	X	X	X	X	X	X	X	X	X	X	X	X	X
F) legs:															
brown to blackish-brown		X	X	X	X	X	X	X	X	X	X	X	X	X	X
flattened tibia with widened apex		X	X	X	X	X	X	X	X	X	X	X	X	X	X
4th article of the tarses equal to the 3 others together		X	X	X	X	X	X	X	X	X	X	X	X	X	X
G) ventral side:															
scattered hairiness denser on the metasternum		X	X	X	X	X	X	X	X	X	X	X	X	X	X
prosternal process very extended at the apex		X	X	X	X		X	X	X	X	X	X	X	X	X
prosternal process barely extended at the apex						X									

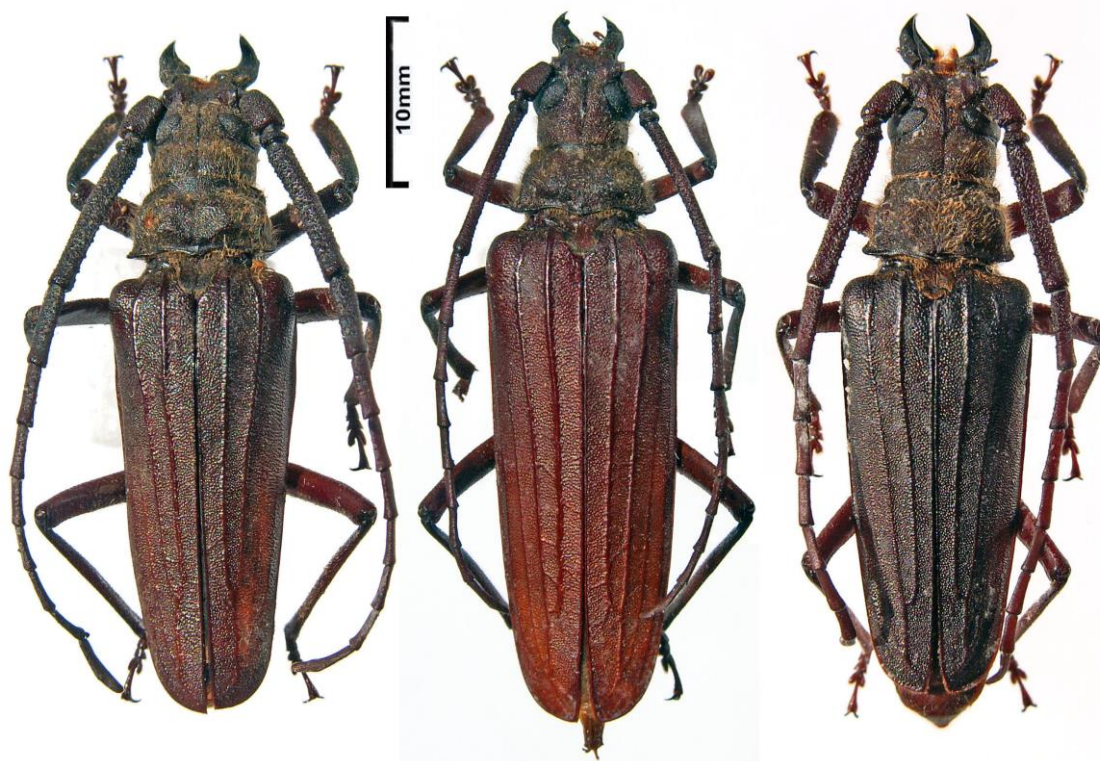


Fig. 1

Overview table for Quang Nam specimens:

morphological characteristics		Mt Axan / Tay Giang / Quang Nam									moy.
A) Size	m:	35	34	38	30	28	32	35	34	33	33,2
	f:										
B) head:											
> eyes											
upper lobe small (1/3 of the lower one)											
		x	x	x	x	x	x	x	x	x	
interocular space equal to the lower edge of the scape											
		x	x	x	x	x	x	x	x	x	
> mandibles											
outer edge angular at one third and two thirds											
		x	x	x	x			x	x	x	
outer edge with a mid-length bump											
						x	x				
outer edge evenly rounded											
C) antennae:											
length:											
	> reaches the elytral apex	x	x	x	x			x			
	> exceeds the elytral apex					x	x				
	> below the elytral apex								x	x	
art.3 equal to almost twice the length of the 4th (0.48)											
		x	x	x	x	x	x	x	x	x	
art. 5 to 10 with widened apex, angular inner side.											
		x	x	x	x	x	x	x	x	x	
D) pronotum:											
subquadrangular, height = approx. 2/3 of the width (0.59)											
		x	x	x	x	x	x	x	x	x	
post. edge wider than front edge											
		x	x	x	x	x	x	x	x	x	
enlarged cordiform bulge in the centre											
		x	x	x	x	x	x	x	x	x	
slightly swollen disc											
		x	x	x	x	x	x	x	x	x	
sparse golden or whitish hairiness											
		x	x	x	x	x	x	x	x	x	
E) elytrae:											
colour:											
	> grey-black satin finish			x	x						x
	> grey-brown satin		x				x	x	x		
	> satin brown	x				x					
ribs: 4 clear and darker ribs											
		x	x	x	x	x	x	x	x	x	
the first joining the second at 3/4 of the length											
		x	x	0	x	x	x	x	x	x	
the 3rd and 4th joining the second before the elytral apex											
		x	x	x	x	x	x	x	x	x	
angular apex or with a short spine											
		x	x	x	x	x	x	x	x	x	
F) legs:											
brown to blackish-brown											
		x	x	x	x	x	x	x	x	x	
flattened tibia with widened apex											
		x	x	x	x	x	x	x	x	x	
4th article of the tarses equal to the 3 others together											
		x	x	x	x	x	x	x	x	x	
G) ventral side:											
scattered hairiness denser on the metasternum											
		x	x	x	x	x	x	x	x	x	
prosternal process very extended at the apex											
		x	x	x	x	x	x	x	x	x	
prosternal process barely extended at the apex											
		x	x	x	x						

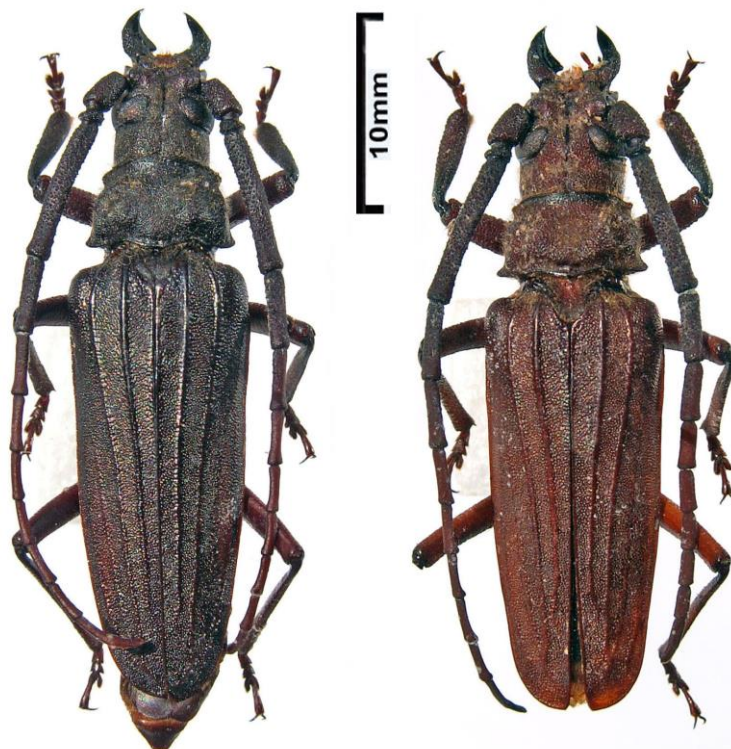


Fig. 2

Overview table for Kon Tum specimens:

morphological characteristics		Mt Ngoc Linh / Kon Tum											moy.
A) Size	m:	30	33	34	33	30	30	30	31	32	30	32	31,3
	f:												
B) head:													
> eyes													
upper lobe small (1/3 of the lower one)		x	x	x	x	x	x	x	x	x	x	x	x
interocular space equal to the lower edge of the scape		x	x	x	x	x	x	x	x	x	x	x	x
> mandibles													
outer edge angular at one third and two thirds			x		x	x		x	x	x			
outer edge with a mid-length bump				x			x						
outer edge evenly rounded		x									x	x	
C) antennae:													
length:	> reaches the elytral apex	x	x	x	x	x	x	x	x		x	x	x
	> exceeds the elytral apex									x			
	> below the elytral apex												
art.3 equal to almost twice the length of the 4th (0.48)		x	x	x	x	x	x	x	x	x	x	x	x
art. 5 to 10 with widened apex, angular inner side.		x	x	x	x	x	x	x	x	x	x	x	x
D) pronotum:													
subquadrangular, height = approx. 2/3 of the width (0.59)		x	x	x	x	x	x	x	x	x	x	x	x
post. edge wider than front edge		x	x	x	x	x	x	x	x	x	x	x	x
enlarged cordiform bulge in the centre		x	x	x	x	x	x	x	x	x	x	x	x
slightly swollen disc													
sparse golden or whitish hairiness		x	x	x	x	x	x	x	x	x	x	x	x
E) elytrae:													
colour:	> grey-black satin finish				x		x	x	x		x	x	
	> grey-brown satin		x	x		x				x			
	> satin brown	x											
ribs: 4 clear and darker ribs		x	x	x	x	x	x	x	x	x	x	x	x
the first joining the second at 3/4 of the length		x	x	x	x	x	0	x	x	x	x	x	x
the 3rd and 4th joining the second before the elytral apex		x	x	x	x	x	x	x	x	x	x	x	x
angular apex or with a short spine		x	x	x	x	x	x	x	x	x	x	x	x
F) legs:													
brown to blackish-brown		x	x	x	x	x	x	x	x	x	x	x	x
flattened tibia with widened apex		x	x	x	x	x	x	x	x	x	x	x	x
4th article of the tarses equal to the 3 others together		x	x	x	x	x	x	x	x	x	x	x	x
G) ventral side:													
scattered hairiness denser on the metasternum		x	x	x	x	x	x	x	x	x	x	x	x
prosternal process very extended at the apex		x	x	x	x	x	x	x		x	x	x	x
prosternal process barely extended at the apex									x				

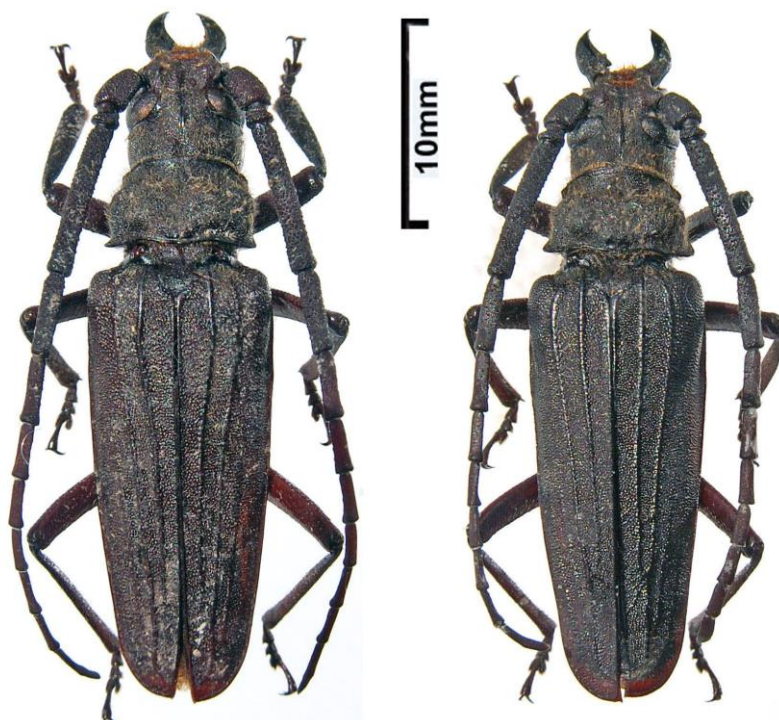


Fig. 3

Overview table for Dak Lak and Thua Thien Hue (Bach Ma) specimens:

morphological characteristics		Dak Lak		moy.	Bach Ma	moy.
A) Size	m:	27	28	27,5		
	f:	33		33	33	33
B) head:						
> eyes						
upper lobe small (1/3 of the lower one)		x	x	x	x	
interocular space equal to the lower edge of the scape		x	x	x	x	
> mandibles						
outer edge angular at one third and two thirds		x	x			
outer edge with a mid-length bump						
outer edge evenly rounded			x		x	
C) antennae:						
length:	> reaches the elytral apex		x	x		
	> exceeds the elytral apex					
	> below the elytral apex	x			x	
art.3 equal to almost twice the length of the 4th (0.48)		x	x	x	x	
art. 5 to 10 with widened apex, angular inner side.		x	x	x	x	
D) pronotum:						
subquadrangular, height = approx. 2/3 of the width (0.59)		x	x	x	x	
post. edge wider than front edge		x	x	x	x	
enlarged cordiform bulge in the centre		x	x		x	
slightly swollen disc						
sparse golden or whitish hairiness		x	x	x	x	
E) elytrae:						
colour:	> grey-black satin finish		x	x		
	> grey-brown satin					
	> satin brown	x			x	
ribs: 4 clear and darker ribs		x	x	x	x	
the first joining the second at 3/4 of the length		0	x	x	0	
the 3rd and 4th joining the second before the elytral apex		x	x	x	x	
angular apex or with a short spine		x	x	x	x	
F) legs:						
brown to blackish-brown		x	x	x	x	
flattened tibia with widened apex		x	x	x	x	
4th article of the tarsi equal to the 3 others together		x	x	x	x	
G) ventral side:						
scattered hairiness denser on the metasternum		x	x	x	x	
prosternal process very extended at the apex		x	x	x	x	
prosternal process barely extended at the apex		x	x	x		

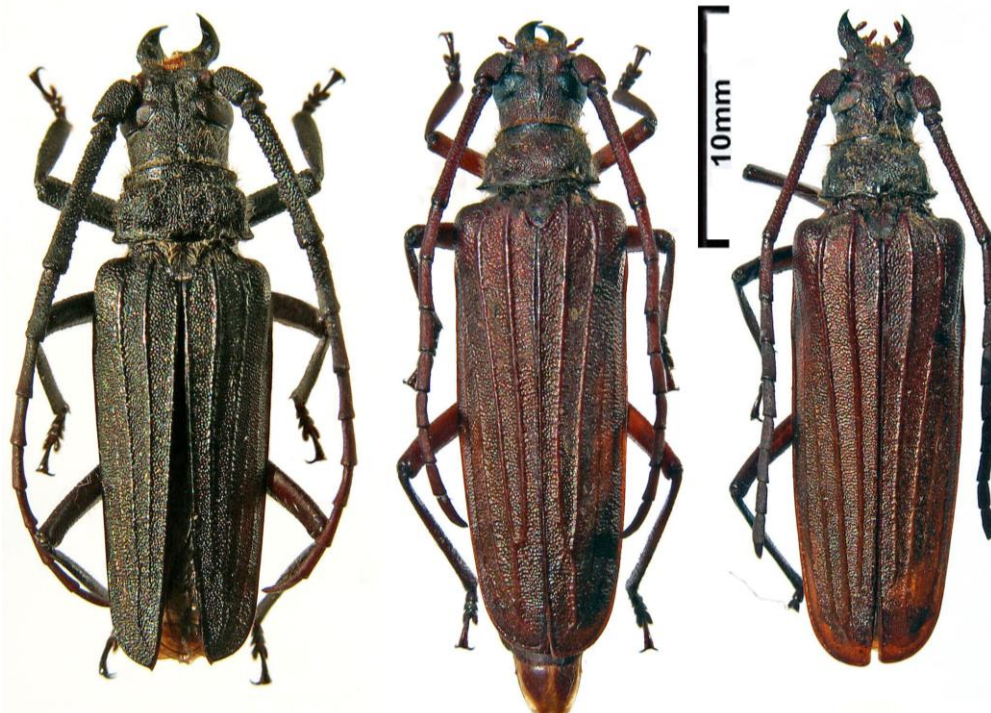
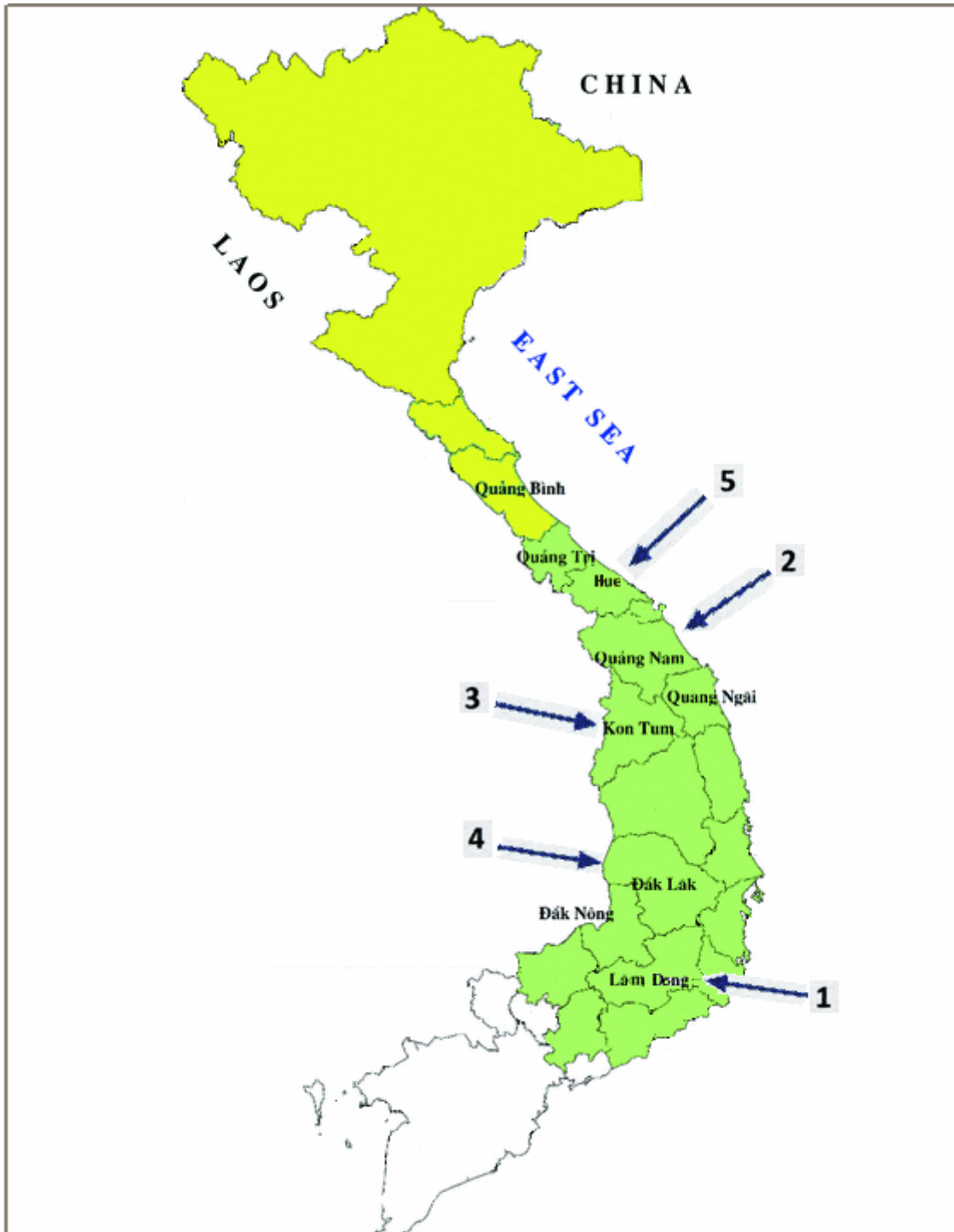


Fig. 4

Distribution area of Metaegosoma annamensis

- 1: Lam Dong / Di Linh & Bao Loc
- 2: Quang Nam / Tay Giang / Mt Axan
- 3: Kon Tum / Mt Ngoc Linh
- 4: Dak Lak prov./ env. Hoa Son
- 5: Thua Thien Hue / Mt. Bach Ma



In green color: presumed limits of the range of this species.

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Bibliography consulted

- LAMEERE (A.), 1909. – Revision des Prionides, douzième mémoire – *Megopis*, *Annales de la société entomologique de Belgique, Bruxelles*, 53 : 135-170.
- LAMEERE (A.), 1915. – Note sur un *Prioninae* nouveau du Yunnan (Col. Cerambycidae). *Bulletin de la Société Entomologique de France*, séance du 9 juin 1915 : 178-179.
- DRUMONT (A.) & KOMIYA (Z.), 2020. – Subfamily Prioninae. Catalogue of species [pp. 105-118]. In: DANILEVSKY M. ed. *Catalogue of Palaearctic Coleoptera, volume 6(1). Chrysomeloidea I (Vesperidae, Disteniidae, Cerambycidae – Revised and Updated Second Edition*. Eds Brill, Leiden, The Netherlands, xxvii + 712 pp
- KOMIYA (Z.), 2000. – Two new species of the genus *Megopis* (Coleoptera, Cerambycidae) from Thailand and Vietnam, with notes on *Megopis pici* LAMEERE and *Megopis annamensis* PIC. *Elytra, Tokyo*, 28: 419–427.
- KOMIYA (Z.) & DRUMONT (A.), 2009. – Study on Prioninae Cerambycid *Megopis* (Coleoptera, Cerambycidae), (Revisional studies of the genus *Megopis* sensu LAMEERE, 1909-9). *Ibid.*, 37 : 313–342.
- KOMIYA (Z.) & DRUMONT (A.), 2012. – Description of a New Genus close to *Aegosoma* (Coleoptera, Cerambycidae, Prioninae). (Revisional studies of the genus *Megopis* sensu LAMEERE, 1909-11). *Elytra, Tokyo*, new series, 2(2): 181-187.
- PIC (M.), 1930. – Nouveautés diverses. *Mélanges Exotico-entomologiques, Moulins*, (55)1: 1-36.