

VIVIAN ELIANA SANDOVAL GÓMEZ

**REVISÃO TAXONÔMICA DO GÊNERO *Xylographus* MELLIÉ, 1847
(COLEOPTERA: POLYPHAGA: CIIDAE) DA ÁFRICA**

Tese apresentada à Universidade Federal de Viçosa, como parte das exigências do Programa de Pós-Graduação em Entomologia, para obtenção do título de Doctor Scientiae.

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Dr. Paschoal Coelho Grossi

Dra. Daniele Regina Parizotto

Dra. Tatianne G. Marques Silva

Prof^ª. Maria Augusta L. Siqueira

Prof. Cristiano Lopes Andrade
(Orientador)

**À minha mãe Cecilia Gómez Cerón quem me apoia e
acompanha incondicional e amorosamente em todos os
momentos da minha vida.**

DEDICO

***“Without taxonomy to give shape to the bricks, and
systematics to tell us how to put them together, the house of
biological science is a meaningless jumble”***

May, 1990

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RESUMO

SANDOVAL GÓMEZ, Vivian Eliana, D. Sc., Universidade Federal de Viçosa, fevereiro de 2013. **Revisão taxonômica do gênero *Xylographus* Mellié, 1847 (Coleoptera: Polyphaga: Ciidae) da África.** Orientador: Cristiano Lopes Andrade.

Ciidae é uma família de pequenos besouros micetobiontes com cerca de 650 espécies descritas, agrupadas em 43 gêneros, os quais ocupam quase todas as terras continentais e insulares do planeta. As larvas e adultos da maioria das espécies vivem associados à basidiomas de macrofungos poróides e dependem exclusivamente deles como hábitat, alimento e local de reprodução. *Xylographus* Mellié é o gênero mais diverso dentro de Orophini com 36 espécies descritas, presente nas regiões tropicais e subtropicais do mundo. As espécies deste gênero, por atingirem os maiores tamanhos corporais dentre os ciídeos, são responsáveis pela decomposição de grandes quantidades de matéria fúngica, disponibilizando diversos nutrientes aos ecossistemas terrestres. Contudo, não há nenhuma revisão taxonômica ou sinopse publicada sobre o gênero, e a identificação das espécies é dificultada pela falta de dados nas descrições originais e a ausência de espécimes identificados nas coleções entomológicas. Na presente tese, foi revisada a taxonomia de *Xylographus* para o continente Africano, o que abriga a maior diversidade, especialmente das regiões biogeográficas Afrotropical e Afrotemperada. O estudo morfológico, morfométrico, dissecação e análise das terminálias abdominais de machos foram baseados em aproximadamente 1200 espécimes pertencentes a 13 coleções entomológicas. Os principais resultados foram: (i) descrição de sete espécies novas; (ii) proposta de *X. testaceitarsis* Pic como sinônimo júnior de *X. anthracinus* Mellié; (iii) *X. seychellensis* Scott, *X. tarsalis* Fahraeus, *X. eichelbaumi* Reitter e *X. rufipennis* Pic como sinônimos júnior de *X. madagascariensis* Mellié; (iv) *X. longicollis* Pic como sinônimo júnior de *X. nitidissimus* Pic; (v) *X. rufescens* Pic como sinônimo júnior de *X. subsinuatus* Pic; (vi) redescrição de nove espécies: *X. anthracinus*, *X. bicolor* Pic, *X. globipennis* Reitter, *X. hypocritus* Mellié, *X. madagascariensis*, *X. nitidissimus*, *X. perforatus* Gerstaecker, *X. subopacus* Pic e *X. subsinuatus*; (v) transferência de *X. dentatus* Pic para o gênero *Cis* Latreille. Uma chave para a identificação das 16 espécies válidas das regiões afrotropical e afrotemperada é apresentada. Os dados de distribuição geográfica, fungos hospedeiros e aspectos morfológicos relevantes foram aprofundados e discutidos.

ABSTRACT

SANDOVAL GÓMEZ, Vivian Eliana, D. Sc., Universidade Federal de Viçosa, February, 2013. **Taxonomic revision of the genus *Xylographus* Mellié, 1847 (Coleoptera: Polyphaga: Ciidae) from Africa.** Advisor: Cristiano Lopes Andrade.

Ciidae is a family of minute mycetobiont beetles with around 650 described species grouped in 43 genera, occupying almost all continental and insular lands of the planet. Larvae and adults of most species live and breed in hard fruiting-bodies of poroid macrofungi and depend entirely upon them for food and shelter. *Xylographus* Mellié is a very diversified genus within the tribe Orophini, with 36 described species, distributed mainly in tropical and subtropical regions. This genus is extremely important due to the large body size of the specimens, in comparison to other species in the family, and the great amount of specimens which breed inside one bracket fungus. Therefore, *Xylographus* are among the most important consumers of fruiting-bodies of macrofungi, being responsible for the decomposition of large amounts of fungic matter and thus providing various nutrients to terrestrial ecosystems. However, there are no published reviews or synopsis on the genus and identification of its species is very difficult due to the anecdotal original descriptions and the absence of identified material in entomological collections. In this thesis was revised the taxonomy of *Xylographus* from the African continent, which has the highest diversity, especially from the Afrotropical and Afrotropical biogeographic regions. Morphological and morphometric studies, and dissection and analysis of male abdominal terminalia were based on about 1200 specimens from 13 entomological collections. The main results are: (i) description of seven new species; (ii) proposition of *X. testaceitarsis* Pic as junior synonym of *X. anthracinus* Mellié; (iii) *X. seychellensis* Scott, *X. tarsalis* Fahraeus, *X. eichelbaumi* Reitter and *X. rufipennis* Pic as junior synonyms of *X. madagascariensis* Mellié; (iv) *X. longicollis* Pic as junior synonym of *X. nitidissimus* Pic; (v) *X. rufescens* Pic as junior synonym of *X. subsinuatus* Pic; (vi) redescription of nine species: *X. anthracinus*, *X. bicolor* Pic, *X. globipennis* Reitter, *X. hypocritus* Mellié, *X. madagascariensis*, *X. nitidissimus*, *X. perforatus* Gerstaecker, *X. subopacus* Pic and *X. subsinuatus*; (v) transfer of *X. dentatus* Pic to *Cis* Latreille. An identification key to the 16 valid species of the Afrotropical and Afrotropical regions is provided. Data on geographic distribution, host fungi and relevant morphological aspects are discussed.

1. INTRODUÇÃO

Ciidae é uma família de Coleoptera que agrupa 43 gêneros e 650 espécies descritas de pequenos besouros micetobiontes (Lawrence & Lopes-Andrade, 2008; Antunes-Carvalho et al., 2012). Há espécies de cídeos em quase todas as terras continentais e insulares do planeta (Lawrence & Lopes-Andrade, 2010). As larvas e adultos da maioria das espécies vivem associados à basidiomas de macrofungos poróides, principalmente aqueles conhecidos vulgarmente como “orelhas-de-pau” e dependem exclusivamente deles como hábitat, alimento e local de reprodução (Lawrence, 1973; Navarrete-Heredia, 1991; Lopes-Andrade, 2002; Graf-Peters et al., 2011). Os registros sobre cídeos adultos em ambientes diferentes dos fungos são escassos, valendo citar alguns em luz ou armadilhas de interceptação de vôo, em serrapilheira e embaixo de troncos de árvores (Lawrence, 1971; Lopes-Andrade, 2007a).

Um alto número de novos táxons de Ciidae tem sido descritos recentemente para a região Neotropical e Andina, com um total de três novos gêneros e 35 espécies propostas entre 2002 e 2012 (Lopes-Andrade, 2010a; Lopes-Andrade, 2010b; Lopes Andrade, 2011; Antunes-Carvalho & Lopes-Andrade, 2011; Lopes-Andrade & Lawrence, 2011; Antunes-Carvalho et al., 2012). Poucos estudos atuais abrangem a fauna de Ciidae Afrotropical, Paleártica e Indo-Australiana (Lawrence & Lopes-Andrade, 2010; Sandoval-Gómez et al., 2011; Rose, 2009, 2012). Contudo, o conhecimento da fauna de Ciidae tropical, subtropical e australotemperada é incipiente e, indubitavelmente, há muitos táxons não descritos, depositados nos museus ou ainda não coletados (Antunes-Carvalho et al., 2012).

Xylographus Mellié, 1847 é o gênero mais diverso dentro de Orophini, com 36 espécies descritas, presente nas regiões tropicais e subtropicais do mundo (Sandoval-Gómez et al., 2011; Lopes-Andrade & Zacaro, 2003). As espécies deste gênero são muito importantes por atingirem os maiores tamanhos corporais dentre os cídeos, sendo assim responsáveis pela decomposição de grandes quantidades de matéria fúngica, disponibilizando diversos nutrientes aos ecossistemas terrestres (Graf-Peters et al., 2011). Os basidiomas que não são colonizados por cídeos persistem na natureza por um tempo muito grande. Nesses casos, os elementos acumulados nessas estruturas

reprodutivas ficam indisponíveis a outros organismos, até que processos naturais mais lentos degradem essas estruturas (Thunes et al., 2000).

1.1. História taxonômica

O nome *Xylographus* foi mencionado pela primeira vez no catálogo de Dejean (1835), mas sem validade taxonômica, pois o autor não citou a espécie-tipo do gênero, não apresentou nenhuma descrição formal do táxon e somente mencionou o nome “*X. hypocrita* Dupont”, espécie também sem validade por não ser descrita formalmente naquele momento. Mellié (1847) apresentou uma breve descrição e citou seis espécies que deveriam ser incluídas no gênero. Contudo, somente uma dessas espécies, *Cis bostrichoides* Dufour, 1843, estava formalmente descrita naquele momento e, portanto, constitui a espécie-tipo do gênero por monotipia. Posteriormente, Mellié (1849) apresentou a descrição formal das outras cinco espécies que havia citado em 1847, e descreveu mais três espécies, respectivamente: *X. anthracinus* Mellié; *X. contractus* Mellié; *X. corpulentus* Mellié; *X. gibbus* Mellié; *X. hypocritus* Mellié; *X. madagascariensis* Mellié; *X. punctatus* Mellié e *X. richardi* Mellié; e também sinonimiza *Cis criatus* Lucas, 1849 com *X. bostrichoides*. Dufour (1850) faz a descrição da larva e da pupa de *X. bostrichoides*.

Ainda no século XIX, outras seis espécies de *Xylographus* foram descritas: *X. perforatus* Gerstaecker, 1871; *X. tarsalis* Fahraeus, 1871; *X. ceylonicus* Ancey, 1876; *X. latirostris* Gorham, 1886; *X. porcus* Gorham, 1886; *X. suillus* Gorham, 1886. Contudo, *X. latirostris* foi transferido para o gênero *Ceracis* Mellié por Lawrence (1971) e *Cis fultoni* Broun, 1886, foi transferido para *Xylographus* por Kuschel (1990).

A primeira metade do século XX foi marcada por um aumento considerável no número de espécies de *Xylographus*, com a descrição de 19 espécies. Reitter descreveu três espécies: *X. tomicoides* Reitter, 1902; *X. eichelbaumi* Reitter, 1908; e *X. globipennis* Reitter, 1911. Maurice Pic foi o autor mais prolífero, tendo descrito 14 espécies: *X. bicolor* Pic, 1916a; *X. brasiliensis* Pic, 1916a; *X. lemoulti* Pic, 1916b; *X. nitidissimus* Pic, 1916a; *X. subsinuatus* Pic, 1916b; *X. testaceitarsis* Pic, 1916a; *X. ritsemai* Pic, 1921; *X. rufescens* Pic, 1921; *X. dentatus* Pic, 1922; *X. longicollis* Pic, 1922; *X. subopacus* Pic, 1929; *X. rufipes* Pic, 1930; *X. rufipennis* Pic, 1934; e *X. javanus* Pic, 1937. Contudo, é praticamente impossível reconhecer essas espécies com

base nas descrições originais, que são breves e não citam características morfológicas importantes na taxonomia do grupo. Ainda no mesmo período, Scott (1926) apresentou a descrição de *X. seychellensis* Scott, mas ressaltando que este poderia ser um sinônimo de alguma das espécies afrotropicais descritas por Pic, as quais não conseguiu examinar. E finalmente Blair (1940) descreveu a espécie *X. bynoei* Blair.

Na segunda metade do século XX somente duas espécies foram descritas: *X. nakanei* Nobuchi, 1955; e *X. scheerpeltzi* Nobuchi & Wada, 1956. Contudo, *X. nakanei* foi sinonimizada com *Paraxestocis unicornis* Miyatake, 1954, por Kawanabe (1995). Recentemente, no início do século XXI, depois de quase 50 anos, uma última espécie foi descrita: *X. lucasi* Lopes-Andrade & Zacaro, 2003. O último artigo publicado sobre o gênero foi em 2011 e inclui a redescricao de *X. globipennis*, uma espécie amplamente distribuída na região Afrotropical (Sandoval-Gómez et al., 2011), o qual constitui o primeiro capítulo desta tese.

1.2. Características morfológicas

Mellié (1849) delimitou o gênero *Xylographus* com base na combinação das seguintes características: (i) corpo geralmente muito convexo; (ii) antena com dez artículos, os três artículos apicais formando uma clava grossa; (iii) mandíbula esquerda dos machos com um prolongamento dorsal conspícuo em forma de dente; (iv) tíbias alongadas da base até a porção mediana, estreitando novamente até o ápice; (v) borda externa das tíbias com uma fileira de “dentes” (cerdas grossas ou esporões).

Adicionalmente a essas características: corpo robusto, glabro ou subglabro, coberto por cerdas e usualmente de coloração preta; antenômeros da clava divididos em duas regiões separadas por uma fileira de cerdas eretas e sensilíferos presentes na clava com morfologia modificada, organizada em camadas concêntricas (Lopes-Andrade & Zacaro, 2002b); primeiro palpômero labial comprido, sendo igual ou maior do que o segundo; primeiro ventrito abdominal dos machos com fôvea muito pequena, considerada ausente por alguns autores (Lawrence, 1971). Em *X. contractus*, a fôvea se encontra rodeada por muitas cerdas, formando uma zona hirsuta e densa (Lopes-Andrade & Zacaro, 2002a; Lopes-Andrade et al., 2002).

1.3. Relações Filogenéticas

Poucos são os trabalhos ou as informações sobre a filogenia dos ciídeos (Buder et al., 2008; Lawrence et al., 2011). Com base em análises moleculares de algumas espécies de Ciidae e de diversas famílias de Cucujiformia, Ciidae apresenta-se como um grupo monofilético, embora os dados não permitiram uma resolução mais detalhada das relações internas da família (Buder et al., 2008). A única espécie de *Xylographus* incluída neste estudo foi *X. scheerpeltzi*. O trabalho filogenético baseado em caracteres morfológicos de adultos e larvas de Coleoptera de Lawrence et al. (2011) incluiu duas espécies de ciídeos: *Sphindocis denticollis* Fall, 1917 e *Cis vitulus* Mannerheim, 1843 os quais ficaram como um clado bem sustentado dentro do grupo dos tenebrionóideos. Porém, não existe nenhuma análise cladística sobre as relações internas do gênero *Xylographus* e nada foi resolvido sobre as relações com os outros gêneros de Orophini.

1.4. Distribuição geográfica

As espécies de *Xylographus* ocorrem nas seguintes regiões biogeográficas (sensu Morrone, 2002), com número de espécies descritas entre parênteses: Afrotropical (16), Neotropical (11), Oriental (3), Paleártica (3), Afrotemperada (1), Australotropical (1) e Neozelândica (1). Assim, o gênero ocorre em todo o denominado reino Holotropical, onde apresenta também a maior diversidade. Fora do reino Holotropical, espécies de *Xylographus* só ocorrem na região Paleártica do reino Holártico e na região Neozelândica do reino Austral, mas com baixa diversidade. Portanto, pode-se considerar que as espécies do gênero têm usualmente distribuição tropical e subtropical.

No oeste da região Afrotropical existem registros do Benim (*X. longicollis*) e da Ilha de São Tomé no Oceano Atlântico (*X. nitidissimus*); do centro tem registros do Congo (*X. dentatus*) e da República Democrática do Congo (*X. subopacus*). A grande maioria das espécies africanas estão distribuídas no leste e nas ilhas do Oceano Índico: (i) região continental: Quênia (*X. rufipennis*) e Tanzânia (*X. eichelbaumi*); (ii) região insular: Madagascar (*X. anthracinus*, *X. bicolor*, *X. hypocritus*, *X. madagascariensis*, *X. subsinuatus* e *X. testaceitarsis*), arquipélago de Zanzibar (*X. perforatus*), Ilhas Seicheles (*X. seychellensis*) e na Ilha Reunião do conjunto das Ilhas Mascarenhas (*X. rufescens*).

O gênero *Xylographus* está representado na região Afrotemperada por somente uma espécie, *X. tarsalis*, reportada da África do Sul.

Nas regiões Afrotropical e Afrotemperada os dados de distribuição geográfica da maioria das espécies estão limitados à localidade-tipo, reflexo dos poucos estudos taxonômicos desenvolvidos neste grupo e às poucas coletas sistemáticas dos mesmos. A maioria das espécies tem uma distribuição continental ou subcontinental, portanto é possível que estejam amplamente distribuídas dentro das suas próprias regiões biogeográficas. Um exemplo é a espécie *X. globipennis*, a qual era conhecida somente da sua localidade tipo na Eritrêa, mas está amplamente distribuída no centro e leste da região Afrotropical, incluindo o Quênia e a República Democrática do Congo (Sandoval-Gómez et al., 2011; Capítulo I desta tese).

1.5. Biologia e ecologia

A grande maioria dos cídeos vive em fungos da ordem Polyporales (Boreostereaceae, Ganodermataceae, Grammotheleaceae, Meripilaceae, Polyporaceae, Steccherinaceae), alguns poucos em Agaricales (Schizophyllaceae, Pleurotaceae, Tricholomataceae, Bolbitiaceae), Hymenochaetales (Hymenochaetaceae) e Russulales (Stereaceae) (Lopes-Andrade, 2007b; Graf-Peters et al., 2011). Porém, pouco se conhece sobre os fungos hospedeiros de *Xylographus*, alguns citados são *Ganoderma applanatum* (Pers.) Pat. 1887 (= *Elfvíngia applanata* (Pers.) P. Karst.) (Ganodermataceae) (Kawanabe, 1998); *Fomes* sp. (Polyporaceae) (Orledge & Reynolds, 2005); *Fomes fomentarius* (L.) J. Kikcsx, 1867 (Polyporaceae) (Nobuchi & Wada, 1956; Kawanabe, 1998); *Ganoderma* sp. (Ganodermataceae) (Navarrete-Heredia & Burgos-Solorio, 2000; Lopes-Andrade & Zacaro, 2003; Orledge & Reynolds, 2005); *Ganoderma australe* (Fr.) Pat. 1889 (= *Fomes nigrolaccatus*) (Ganodermataceae) (Reitter, 1908; Ferrer, 1997; Graf-Peters et al., 2011); *Phellinus* sp., *Phellinus apiahynus* (Speg.) Rajchenb. & J. E. Wright, *Phellinus fastuosus* (Lév.) S. Ahmad, *Phellinus gilvus* (Schwein.) Pat. e *Phellinus grenadensis* (Murrill) Ryvarden (Hymenochaetaceae) (Graf-Peters et al., 2011).

Os adultos e larvas de *Xylographus* vivem em basidiomas de macrofungos poróides, principalmente aqueles conhecidos vulgarmente como “orelhas-de-pau” (Lawrence, 1973; Navarrete-Heredia, 1991; Lopes-Andrade, 2002). Por possuírem um tamanho corporal maior em comparação com os demais cídeos, *Xylographus* consegue consumir basidiomas mais rígidos e maiores, movimentando e decompondo, assim, muita biomassa (Lawrence, 1973).

Os estudos sobre o comportamento e biologia de *Xylographus* são escassos, limitando-se a um único estudo que propõe que machos de *X. contractus* liberam feromônio sexual pela fôvea do primeiro ventrito abdominal (Lopes-Andrade et al., 2003). Os machos estão geralmente fora dos fungos, enquanto que as fêmeas permanecem dentro e ovipõem nas galerias do fungo (Lawrence, 1974). Portanto, este feromônio pode ser importante na corte, atraindo as fêmeas para a superfície do fungo, local onde ocorrerá a cópula (Lopes-Andrade et al., 2003).

2. OBJETIVOS

Objetivo geral: Revisar a taxonomia das espécies do gênero *Xylographus* Mellié, 1847 encontradas nas regiões biogeográficas Afrotropical e Afrotropical.

Objetivos específicos:

- (i) Descrever as espécies novas e redescrever as espécies conhecidas, baseado no estudo comparativo dos tipos;
- (ii) Designar lectótipos para as espécies descritas;
- (iii) Propor sinonímias;
- (iv) Descrever a terminália abdominal dos machos;
- (v) Elaborar uma chave taxonômica para a identificação das espécies;
- (vi) Mapear os registros de distribuição geográfica;
- (vii) Fornecer dados de hospedeiros e de biologia;
- (viii) Discutir os aspectos morfológicos relevantes para a taxonomia.

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4. RESULTADOS

Esta tese é apresentada na forma de dois capítulos, sendo o primeiro um artigo publicado e o segundo um manuscrito. O capítulo II não deve ser considerado como publicação válida para fins de nomenclatura zoológica, de acordo com as normas do Código Internacional de Nomenclatura Zoológica (Cap. 3, Art. 8.2 e Art. 8.3). Abaixo exponho brevemente o conteúdo e os principais resultados de cada capítulo.

CAPÍTULO I: Sandoval-Gómez, V. E., Lopes-Andrade, C. & Zacaro, A. A. (2011). *Xylographus globipennis* Reitter, 1911 (Coleoptera: Ciidae): A barely studied species with broad distribution in the Afrotropical region. *Entomological Science* 14, 326–332.

A espécie *Xylographus globipennis* Reitter, 1911, que originalmente era conhecida apenas da sua localidade tipo na Eritreia, apresenta uma ampla distribuição na região Afrotropical. Neste artigo esta espécie foi redescrita baseada no lectótipo, neste designado, e três paralectótipos, além de espécimes de diferentes localidades da República Democrática do Congo e do Quênia. A terminália abdominal dos machos foi descrita e foi apresentado um mapa com a distribuição geográfica da espécie. Os caracteres morfológicos externos desta espécie foram comparados com as outras espécies africanas.

CAPÍTULO II: Sandoval-Gómez, V. E. & Lopes-Andrade, C. A monograph of the Afrotropical and Afrotemperate *Xylographus* Mellié, 1847 (Coleoptera: Ciidae). Manuscrito original, apresentado em formato de submissão para publicação.

A fauna Afrotropical e Afrotemperada do gênero *Xylographus* Mellié, 1847 foi revisada a partir do estudo morfológico, morfométrico, dissecção e análise das terminálias abdominais de machos de aproximadamente 1200 espécimes pertencentes a 13 coleções entomológicas. Como resultados foram descritas sete espécies novas, sinonimizadas sete espécies, redescritas nove e uma transferida para *Cis* Latreille. Apresenta-se uma chave para a identificação das 16 espécies válidas das regiões afrotropical e afrotemperada, e mapas da sua distribuição geográfica. Os dados de distribuição, fungos hospedeiros e aspectos morfológicos relevantes foram aprofundados e discutidos.

CAPÍTULO I

Xylographus globipennis Reitter, 1911 (Coleoptera: Ciidae): A barely studied species with broad distribution in the Afrotropical region

Sandoval-Gómez, V. E., Lopes-Andrade, C. & Zacaro, A. A. (2011).

Artigo publicado na revista Entomological Science (2011), 14: 326–332.

ORIGINAL ARTICLE

Xylographus globipennis Reitter, 1911 (Coleoptera: Ciidae):
A barely studied species with broad distribution in the
Afrotropical region

Vivian Eliana SANDOVAL-GÓMEZ¹, Cristiano LOPES-ANDRADE²
and Adilson Ariza ZACARO³

¹Programa de Pós-Graduação em Entomologia, Departamento de Entomologia, ²Departamento de Biologia Animal, and

³Departamento de Biologia Geral, Universidade Federal de Viçosa, Viçosa, Minas Gerais, Brazil

Abstract

Xylographus globipennis Reitter, 1911, a ciid beetle known only from its type locality in Eritrea, has in fact a broad distribution in the Afrotropical region. A redescription of the species is provided, including the description of its male terminalia, based on the lectotype and three paralectotypes, here designated, and specimens from several localities in Democratic Republic of the Congo and in Kenya. The geographic distribution and similarities of external morphological characters of *X. globipennis* to other African *Xylographus* species are also discussed.

Key words: Africa, Democratic Republic of the Congo, Eritrea, Kenya, minute tree-fungus beetle, systematics.

INTRODUCTION

Xylographus Mellié is currently the most speciose Orophini genus with 36 described species, and its highest diversity is found in tropical and subtropical regions. It is recognizable by the following features (Lopes-Andrade & Zacaro 2003; Lawrence & Lopes-Andrade 2010): (i) robust convex body, usually black; (ii) developed antennal club with a sinuous row of setae along its transversal midline; (iii) each sensillifer of the antennal club formed by a group of short setae organized in conspicuous concentric layers; (iv) first labial palpomere elongate, being almost as long or longer than the second palpomere; and (v) ovipositor reduced, devoid of gonostyli.

There are 17 described Afrotropical *Xylographus*, including continental and insular species: *X. anthracinus*

Mellié, 1849; *X. bicolor* Pic, 1916; *X. dentatus* Pic, 1922; *X. eichelbaumi* Reitter, 1908; *X. globipennis* Reitter, 1911; *X. hypocritus* Mellié, 1849; *X. longicollis* Pic, 1922; *X. madagascariensis* Mellié, 1849; *X. nitidissimus* Pic, 1916; *X. perforatus* Gerstaecker, 1871; *X. rufescens* Pic, 1921; *X. rufipennis* Pic, 1934; *X. seychellensis* Scott, 1926; *X. subopacus* Pic, 1929; *X. subsinuatus* Pic, 1916; *X. tarsalis* Fåhraeus, 1871; *X. testaceitarsis* Pic, 1916. These species were described in scattered works by Fåhraeus (1871), Gerstaecker (1871), Mellié (1849), Reitter (1908, 1911) and Pic (1916a,b, 1921, 1922, 1929, 1934). Additionally, Ferrer (1997) provided notes and drawings of the types of *X. tarsalis* and *X. eichelbaumi*. The species described by Pic (1916a,b, 1921, 1922, 1929, 1934) are the most problematic, since their descriptions are very brief and it is possible that they constitute synonyms of species previously proposed by other authors. The difficulty in recognizing species of African *Xylographus* has led Scott (1926) to write about his hesitation in describing *X. seychellensis*.

In this work, we redescribe *Xylographus globipennis* Reitter, 1911 based on the lectotype and three paralectotypes from Eritrea, here designated, and 842 specimens from the Democratic Republic of the Congo and

Correspondence: Vivian Eliana Sandoval-Gómez, Programa de Pós-Graduação em Entomologia, Departamento de Biologia Animal, Universidade Federal de Viçosa, 36570-000, Viçosa, Minas Gerais, Brazil.
Email: vivian.sandoval@gmail.com

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Kenya. We also describe its male terminalia, provide new data on its geographic distribution and compare it to other Afrotropical species of the genus.

MATERIALS AND METHODS

Dissected male terminalia were stained with Chlorazol Black E (C.I. no. 30235), and preparation of slide mounts followed the protocol described by Lopes-Andrade *et al.* (2009). Photography of slide mounts and measurement of the terminalia's sclerites, legs and antennomeres were made under a compound microscope (Axioskop 40, Zeiss, Oberkochen, Germany) equipped with a digital camera (A640, Canon, Tokyo, Japan). Measurements of specimens, final comparisons and descriptions of general external morphology were made under a stereomicroscope (MZ8, Leica, Wetzlar, Germany). Digital photographs of dorsal and lateral pronotal surfaces were taken with a Canon S70 adapted to a Leica MZ16, and final images were the result of joining 20 to 40 photographs in different focus using the image stacking freeware CombineZM (Hadley 2006).

For scanning electron microscopy (SEM), museum specimens glued onto cards were rehydrated and cleaned under a stereomicroscope. Then, specimens were dehydrated using ethanol (50, 70, 80, 95, 100%), dried in a critical point dryer (CPD 020, Balzers, Balzers, Liechtenstein), mounted on aluminum stubs and coated with sputtered gold (sputter module SCA 010, Balzers). Samples were then examined under a SEM (LEO VP 1430, Zeiss). The lectotype had another treatment: it was cleaned and photographed onto its original card, without dehydration and gold covering, and analyzed under a variable pressure SEM (SEM-VP) using a back-scattered electron detector.

The redescription of this species was based on the lectotype, which is a small weakly pigmented male, and three paralectotypes from Eritrea, here designated, and on subsamples of specimens from other localities in the Afrotropical region. The lectotype and paralectotypes were not dissected. Terms for external morphology and male terminalia of ciids are explained and discussed by Lopes-Andrade and Lawrence (2005).

Measurements provided in the redescription are those of the lectotype. At most ten specimens (five males and five females, arbitrarily chosen) from each locality represented in the available material were measured. When the size of specimens from each locality was visually different, we arbitrarily chose specimens from each distinguishable size category. Range, mean and standard deviation are given for measurements and ratios of these subsamples. The following symbols are used for measurements (in millimeters) and ratios: BW, basal width

of the scutellum; CL, length of the antennal club (corresponding to antennomeres eight to ten); EL, elytral length (median length from base of scutellum to elytral apex); EW, greatest elytral width; FL, length of the antennal funicle (corresponding to antennomeres three to seven); GD, greatest depth of the body (from elytra to metaventricle); GW, greatest width of the eye; PL, pronotal length along midline; PW, greatest pronotal width; TL, total length (= EL + PL; head not included). The ratio GD/EW was taken as an indication of degree of convexity; TL/EW indicates degree of body elongation. Differences among the specimens are given below in the section on Variation, together with standard measurements and ratios.

We examined named specimens of six Afrotropical species: *X. eichelbaumi*, *X. hypocritus*, *X. madagascariensis*, *X. perforatus*, *X. seychellensis* and *X. tarsalis*. We did not examine *X. anthracinus* and the remaining species of Pic.

The distribution map (Fig. 29) was created using latitude and longitude coordinates estimated by tracking localities in the online database GeoNames (Wick 2010) and plotting them in a map using the freeware DIVA-GIS 7.1.6 (Hijmans *et al.* 2001).

Specimens have been deposited in (or belong to) the following institutional and private collections (with acronyms used in this paper): HNHM, Coleoptera Collection, Hungarian Natural History Museum (Budapest, Hungary); LAPC, Cristiano Lopes-Andrade Private Collection (Viçosa, MG, Brazil); MRAC, Koninklijk Museum voor Midden Afrika (Tervuren, Belgium); SNSD, Senckenberg Naturhistorischen Sammlungen Dresden (Dresden, Germany).

SYSTEMATICS

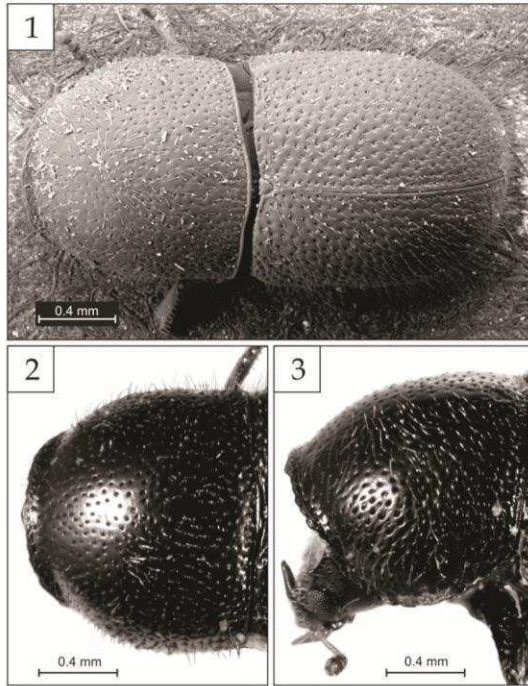
Xylographus globipennis Reitter, 1911

(Figs 1–29)

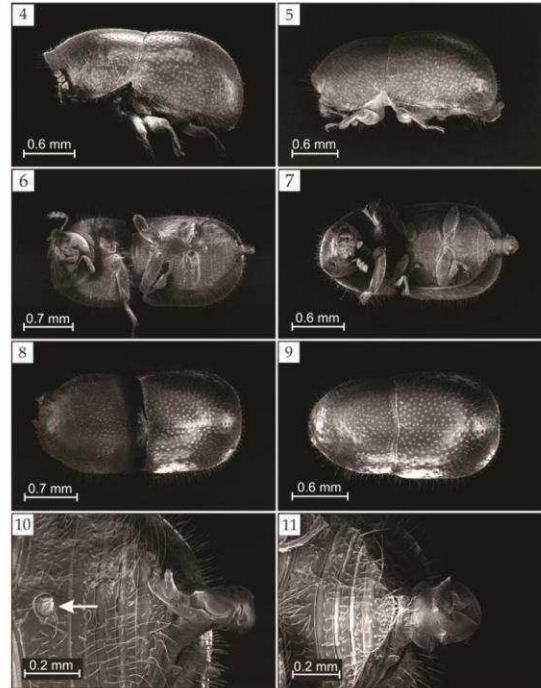
Redescription

Diagnosis. Males with anterior and lateral margins of pronotum crenulated (Figs 1–4); pronotum and elytra coarsely punctate (Figs 14,15), covered with long and slender yellowish bristles; males with left mandible bearing a conspicuous tooth (Fig. 18, arrow).

Males (Figs 1,2,3,4,6,8,10,12,14,16–28). *Lectotype* (here designated): TL 2.45; PL 1.19; PW 1.14; EL 1.26; EW 1.19; GD 1.06. Ratios: PL/PW 1.04; EL/EW 1.06; EL/PL 1.06; GD/EW 0.89; TL/EW 2.06. Body robust, convex; dorsal and ventral surfaces mostly black, with punctation and vestiture single (Figs 1–4,8); basal antennomeres and funicle, mouthparts and tarsi dark yellowish brown; antennal club black. Head subquadrate (as



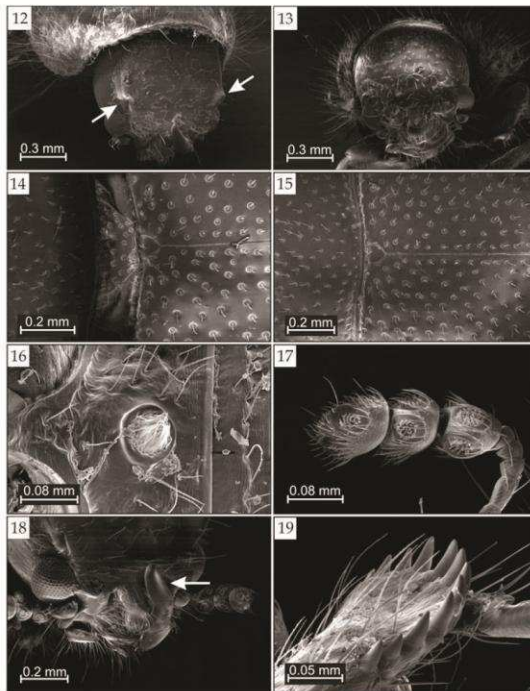
Figures 1–3 Male *Xylographus globipennis* Reitte. 1 SEM-VP micrograph of the lectotype from “Gorbatuco” (Eritrea) in dorsal view; 2,3 dorsal and lateral view of pronotum of a specimen from Mahagi (Democratic Republic of the Congo, Ituri Province).



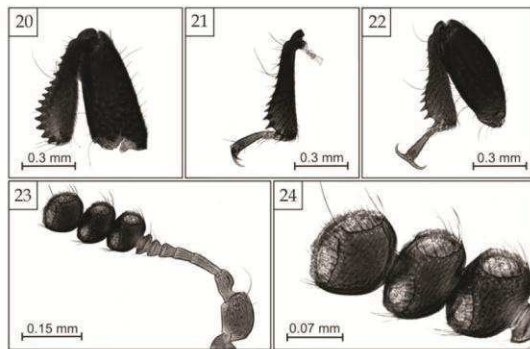
Figures 4–11 SEM micrographs of male (figures at left) and female (figures at right) of *Xylographus globipennis* Reitter from Mahagi (Democratic Republic of the Congo, Ituri Province). 4,5 Habitus, lateral view; 6,7 habitus, ventral view; 8,9 habitus, dorsal view; 10,11 abdominal ventrites, showing the male setose sex patch (arrow).

seen from above) and concave, with dorsum almost glabrous, but with some erect yellowish bristles mainly near each eye; punctation fine and sparse, in between punctures smooth; frontoclypeal region sinuous, the sides slightly projected and broadly rounded; frons slightly elevated at middle; each lateral margin of vertex just behind the eye elevated into a small subtriangular tubercle with an oblique longitudinal orientation (Figs 3,12, arrows). Mouthparts with distinct asymmetric mandibles, in which the left mandible bears a conspicuous tooth projected upward (Fig. 18, arrow). Each antenna (Fig. 23) with ten antennomeres (FL 0.16, CL 0.23, CL/FL 1.43); length of the antennomeres (in mm) as follows: 0.11, 0.06, 0.07, 0.03, 0.03, 0.02, 0.01, 0.07, 0.06, 0.1; developed antennal club, in which each antennomere has a sinuous row of erect setae surrounding the sensillifers, somewhat dividing the antennomere into an upper region with short setae and a lower bearing scale-like cuticle (Figs 17,24); each sensillifer formed by a group of short setae organized in conspicuous concentric layers (Fig. 17). Each eye glabrous, with

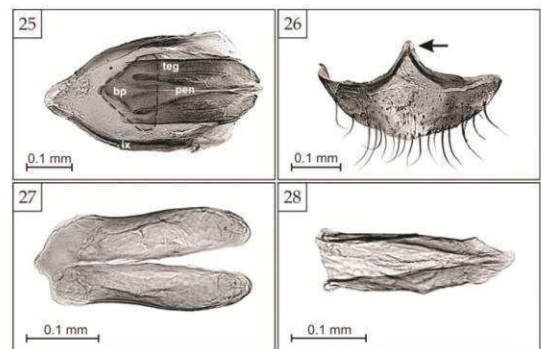
GW of 0.18 mm. Pronotum coarsely punctate; punctures separated by a distance of one to three puncture-widths; each puncture bearing a slender, yellowish, erect or decumbent, long and slender bristle; in between punctures smooth (Figs 1–3); anterior and lateral margins somewhat denticulate and curved upward (Figs 2–4); anterolateral angles broadly rounded (Fig. 3); lateral margins not seen from above (Figs 1,2,8). Scutellum small (BW 0.08), subtriangular, subglabrous and bearing a few punctures (Fig. 14). Elytra convex, lateral and posterolateral margins broadly rounded, their margins not seen from above; punctation coarser and slightly sparser than that of pronotum, with similar in between punctures and vestiture; punctures separated by a distance of one to two puncture-widths. Hind wings present and fully developed (macropterous species), with apical area longer than basal area; apical area bearing two incomplete pigmented lines, one line near the anterior margin and the other almost reaching the posterior margin; each line diffused on their beginning



Figures 12–19 SEM micrographs of *Xylographus globipennis* Reitter from Mahagi (Democratic Republic of the Congo, Ituri Province). 12,13 Frontal view of male head, showing the small subtriangular tubercles on each lateral margin of the vertex (arrows), and female head devoid of such tubercles, respectively; 14,15 dorsal view of pronotum, scutellum and elytra of male and female, respectively; 16 male setose sex patch; 17 antennal club; 18 frontal view of male head, showing the tooth in the left mandible (arrow); 19 anterior tibia, showing the teeth along its outer margin.



Figures 20–24 Slide preparations of male *Xylographus globipennis* Reitter from Mahagi (Democratic Republic of the Congo, Ituri Province). 20 Protibia; 21 mesotibia; 22 metatibia; 23 antenna; 24 antennal club.



Figures 25–28 Slide preparations of male terminalia of *Xylographus globipennis* Reitter from Mahagi (Democratic Republic of the Congo, Ituri Province). 25 Ninth segment and aedeagus; 26 eighth sternite, showing a median strut (arrow); 27 tegmen; 28 penis, showing a basal piece (dashed line); pen, penis; teg, tegmen; ix, ninth segment.

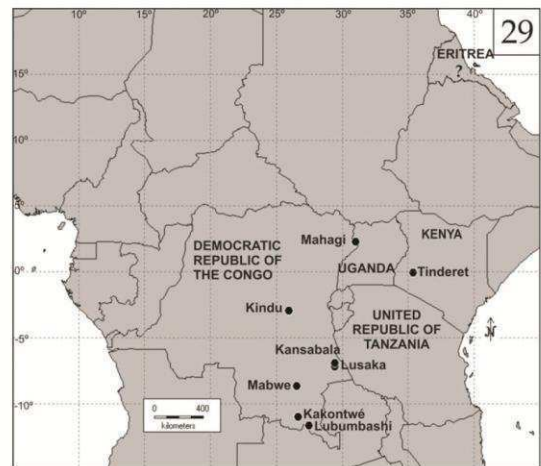


Figure 29 Map showing the known localities (●) of *Xylographus globipennis* Reitter in the Afrotropical region. The exact locality in Eritrea is unknown and for this reason it is represented by (?).

and darker on the end; the upper line expands in a conspicuous pigmented patch covering a great area of the wing tip. Prosternum concave; prosternal process tapering to an acute apex. Metaventricle (Fig. 6) with disc almost glabrous; lateral sides with coarse, irregular, sparse punctures; each puncture bearing a slender, yellowish, decumbent, long bristle; in between punctures smooth. Abdominal ventrites (Fig. 10) with sparse slender setae; first abdominal ventrite almost twice as

long as the second at the longitudinal midline; disc of first ventrite with a small, margined, circular and setose sex patch at middle (Fig. 10, arrow; Fig. 16). Each tibia (Figs 19–22) with a row of teeth along the entire outer margin.

Male terminalia (lectotype and paralectotypes were not dissected). Ninth segment (Fig. 25) V-shaped. Sclerotized anterior edge of the eighth sternite bearing a median strut (Fig. 26, arrow). Aedeagus (Figs 25,27,28) subquadrate, twice as long as wide. Basal piece (Fig. 25, dashed outline) subtriangular, membranous, twice as wide as long and with rounded angles. Tegmen (Figs 25,27) as long as the penis, bearing a deep and long emargination that forms two lateral lobes, each lobe with a patch of sensillae at the apex. Penis (Figs 25,28) subcylindrical; apex subtriangular.

Females (Figs 5,7,9,11,13,15). Similar to males except in the following features: abdominal sex patch absent (Figs 7,11); head convex or flat (Fig. 13), covered with more bristles than in males; left mandible devoid of projected tooth (Fig. 13); anterior and lateral margins of pronotum broadly rounded and not denticulated, and anterior portion of pronotum narrower than in males (Fig. 9).

Variation. Males ($n = 32$, including the lectotype): TL 2.06–2.95 (2.59 mean \pm 0.19 SD); PL 0.95–1.42 (1.21 \pm 0.12); PW 1.05–1.53 (1.29 \pm 0.12); EL 1.11–1.58 (1.38 \pm 0.11); EW 1.16–1.53 (1.36 \pm 0.11); GD 1.00–1.42 (1.22 \pm 0.10). Ratios: PL/PW 0.75–1.18 (0.94 \pm 0.08); EL/EW 0.88–1.25 (1.02 \pm 0.08); EL/PL 0.96–1.40 (1.15 \pm 0.11); GD/EW 0.76–1.04 (0.90 \pm 0.05); TL/EW 1.64–2.33 (1.91 \pm 0.14). Females ($n = 30$): TL 2.16–2.69 (2.45 \pm 0.15); PL 0.95–1.32 (1.12 \pm 0.08); PW 1.10–1.42 (1.24 \pm 0.09); EL 1.16–1.53 (1.33 \pm 0.10); EW 1.14–1.53 (1.33 \pm 0.09); GD 1.08–1.37 (1.21 \pm 0.08). Ratios: PL/PW 0.81–0.96 (0.90 \pm 0.04); EL/EW 0.88–1.15 (1.00 \pm 0.07); EL/PL 1.04–1.44 (1.20 \pm 0.10); GD/EW 0.85–0.96 (0.91 \pm 0.03); TL/EW 1.70–1.98 (1.84 \pm 0.07). Specimens from “Elisabethville” (currently Lubumbashi) have shorter and denser erect bristles in elytra in comparison to the other specimens. A variation between light-brown to solid black tegument is evident. However, light-brown and dark-brown specimens may be adults preserved soon after their emergence and, consequently, not fully pigmented yet. The biggest specimens are from Lusaka and the smallest ones are from Mahagi.

Material examined. Eritrea, lectotype, male (HNHM) \Erythraea [Eritrea], Gorbato, 7.III.1909 [handwritten] \ Holotypus [printed] 1911, *Xylographus globipennis*, Reitter [handwritten] \ Coll. Reitter [printed] \ [pink label] LECTOTYPE Sandoval-Gómez,

Lopes-Andrade & Zacaro [handwritten]; 3 paralectotypes (2 HNHM, 1 SNSD) \Erythraea [Eritrea], Gorbato, 7.III.1909 [handwritten] \ Paratypus [printed] 1911, *Xylographus globipennis*, Reitter [handwritten] \ Coll. Reitter [printed] \ [orange label] PARALECTOTYPE Sandoval-Gómez, Lopes-Andrade & Zacaro [handwritten] \ DEMOCRATIC REPUBLIC OF THE CONGO, 52 specimens (36 MRAC, 16 LAPC) \MUSÉE DU CONGO, Ituri, Mahagi [printed], 31 [handwritten] -V-25, Dr H. Schouteden [printed]; 29 specimens (9 LAPC, 20 MRAC) \[light blue label] Récolté sur [printed] Polypore [handwritten] \ Coll. MUS. CONGO, Katanga, Kakontwé, IX-48, N. Leleup; 38 specimens (14 LAPC, 24 MRAC) \[light blue label] Récolté sur [printed] Polypore [handwritten] \ Coll. MUS. CONGO, Katanga, Kakontwé, Sav. Bois, VIII-48, N. Leleup; 1 specimen (MRAC) \Coll. MUS. CONGO Katanga: Kakontwé Sav. Bois. VIII-1948 N. Leleup \ Grotte Defrense (Kakontwé) Septembre 1948 N. LELEUP [handwritten]; 2 specimens (1 LAPC, 1 MRAC) \MUSÉE DU CONGO [printed] Kindu II-1919 [handwritten] R. Mayné [printed]; 15 specimens (5 LAPC, 10 MRAC) \MUSÉE DU CONGO Elisabethville [Lubumbashi] [printed] -1932 [handwritten] De Loose [printed] Ch-37 [handwritten]; 2 specimens (1 LAPC, 1 MRAC) \MUSÉE DU CONGO Elisabethville [Lubumbashi] [printed] -1932 [handwritten] De Loose [printed] Ch-43 [handwritten]; 128 specimens (88 MRAC, 40 LAPC) \MUSÉE DU CONGO Elisabethville [Lubumbashi] -1932 De Loose [printed] Ch-33 [handwritten]; 94 specimens (63 MRAC, 31 LAPC) \MUSÉE DU CONGO Elisabethville [Lubumbashi] -1932 De Loose [printed] Ch-39 [handwritten]; 1 specimen (MRAC) \Congo Belge: P.N.U. Mabwe (r E. lac Upemba) (585 m) 11-26-I-1949 Mis. G. F. de Witte. 2212a \ A Janssens det., 195 [printed] 2 Cioidae Gen. *Xylographus* ou voisin. [handwritten]; 409 specimens (280 MRAC, 129 LAPC) \Dans polypore [light blue label] \ COLL. MUS. CONGO Tanganika: Lusaka Rte Baudouin. - Manono H. Bomans V-1953; 8 specimens (6 MRAC, 2 LAPC) \Dans polypore [light blue label] \ COLL. MUS. CONGO Tanganika: Kansabala 1200 m VIII-1953. KENYA, 63 specimens (21 LAPC, 42 MRAC) \Rift Valley Prov. Tinderet for. 2300 m Kipsigis farm 20/24-VIII-1977 \ Coll. Mus. Tervuren Kenya: VII/IX-1977 G. Coulon \.

We have located four *X. globipennis* syntypes, one labeled as the holotype and three as paratypes. Therefore, although Reitter has not mentioned a holotype or a type series, we are able to assume that *X. globipennis* was described from a series of specimens from Eritrea. We also assume that holotype and paratype labels were added after the species' description. We here designate

the specimen bearing the “holotype” label as the lectotype (Fig. 1), and each of the three specimens bearing paratype labels as paralectotypes. Appropriate labels have been added to their pins. We have chosen the specimen labeled as “holotype” to be the lectotype since it belongs to the collection containing the largest number of syntypes of the nominal species-group taxon (HNHM) and it is the only one with an additional handwritten locality label, possibly the original label written by the collector.

DISCUSSION

The species of *Xylographus* are difficult to recognize due to the lack of diagnostic characters for most species and insufficient morphological features cited in their original descriptions, making difficult the identification of specimens without comparison to type material (Lopes-Andrade & Zacaro 2003). The lack of taxonomic keys for species of the genus makes it a slow task to identify any sample of specimens. There are two African species of *Xylographus* described as possessing bristles at the dorsal surface: (i) *X. dentatus* distributed in the Democratic Republic of the Congo; and (ii) *X. subsinuatus* from Madagascar. Both are too briefly and inadequately described for close comparison, but *X. dentatus* is described as having short scattered body bristles and *X. subsinuatus* as having few bristles. Therefore, their vestiture is quite distinct from the vestiture of long and slender yellowish bristles of *X. globipennis*.

The remaining 14 species of Afrotropical *Xylographus* are easily distinguished from *X. globipennis* by their glabrous body with a sinuous anterior edge of pronotum. *Xylographus hypocritus* and *X. anthracinus* have the anterior sides of pronotum angulate. On the other hand, *X. eichelbaumi*, *X. madagascariensis*, *X. perforatus*, *X. rufescens*, *X. seychellensis*, *X. subopacus* and *X. tarsalis* have the anterior sides of pronotum broadly rounded as *X. globipennis*. The examined named specimens of *X. hypocritus*, *X. perforatus*, *X. seychellensis* and *X. tarsalis* are visibly bigger than *X. globipennis*. The limited information about *X. bicolor*, *X. longicollis*, *X. nitidissimus*, *X. rufipennis*, *X. subopacus* and *X. testaceitarsis*, all described by Pic after Reitter (1911) described *X. globipennis*, is about the coarse and strong dorsal punctuation of those species.

The Palearctic species of *Xylographus* are similar to *X. globipennis* in the dense dorsal vestiture of long setae of pronotum and elytra. *Xylographus bostrichoides* (Dufour, 1843) and *X. tomicoides* Reitter, 1902 have long and erect brownish to black bristles in the body,

and *X. scheerpeltzi* Nobuchi and Wada, 1956 has the body covered with rather long yellowish setae. The denticulation of the anterior and lateral pronotal margins of male *X. globipennis* is the most conspicuous character that clearly distinguishes it from all the other described *Xylographus*.

Xylographus globipennis was originally known only from the type locality “Gorbatuco” in Eritrea; which exact geographical position was not elucidated. Now, its distribution is expanded to seven localities in the Democratic Republic of the Congo and one locality in Kenya (Fig. 29). The Afrotropical region comprises Central Africa (southern Sahara), the Arabian Peninsula, Madagascar and the West Indian Ocean islands (Morrone 2002) and is well known for its huge biodiversity and endemic taxa. *Xylographus globipennis* is the only known species of *Xylographus* showing a broad distribution in this region and the one with the northernmost localities, followed by *X. longicollis* which is known from Benin (Western Africa). It seems that like *X. globipennis*, other *Xylographus* species have a common pattern of being widely distributed in a biogeographical region. For instance *X. gibbus* Mellié, 1849 and *X. punctatus* Mellié, 1849 are commonly found throughout the Neotropical region (C. Lopes-Andrade, pers. obs., 2010); *X. bostrichoides* and *X. tomicoides* have a broad Palearctic distribution including Europe, northern Africa and Asia. This condition will only be confirmed with a revision of the genus and further studies on the distribution of its species.

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CAPÍTULO II

A monograph of the Afrotropical and Afrotperate *Xylographus* Mellié, 1847 (Coleoptera: Ciidae)¹

Sandoval-Gómez, V. E. & Lopes-Andrade, C.

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¹ Este manuscrito não deve ser considerado como publicação válida para fins nomenclaturais, de acordo com as normas do Código Internacional de Nomenclatura Zoológica (Cap. 3, Art. 8.2 e Art. 8.3).

**A monograph of the Afrotropical and Afrotperate *Xylographus* Mellié, 1847
(Coleoptera: Ciidae)²**

Vivian Eliana SANDOVAL-GÓMEZ ¹ & Cristiano LOPES-ANDRADE ²

¹Programa de Pós-Graduação em Entomologia, Departamento de Entomologia, Universidade Federal de Viçosa, 36570-000, Viçosa, Minas Gerais, Brazil,

²Departamento de Biologia Animal, Universidade Federal de Viçosa, 36570-000, Viçosa, Minas Gerais, Brazil.

Correspondence: Vivian Eliana Sandoval-Gómez, Programa de Pós-Graduação em Entomologia, Departamento de Entomologia, Universidade Federal de Viçosa, 36570-000, Viçosa, Minas Gerais, Brazil. Email: vivian.sandoval@gmail.com

² **This manuscript should not be regarded as a valid publication for nomenclatural purposes, in the sense of the Chapter 3, Article 8.2 and 8.3 of the International Code of Zoological Nomenclature.**

Abstract

The Afrotropical and Afrotropicate faunas of *Xylographus* Mellié are studied based on morphology and morphometry of adult males and females, dissection and examination of male abdominal terminalia. Seven new species are described and seven synonyms are proposed: *X. testaceitarsis* Pic as **junior synonym** of *X. anthracinus* Mellié; *X. seychellensis* Scott, *X. tarsalis* Fahraeus, *X. eichelbaumi* Reitter and *X. rufipennis* Pic as **junior synonyms** of *X. madagascariensis* Mellié; *X. longicollis* Pic as **junior synonym** of *X. nitidissimus* Pic and *X. rufescens* Pic as **junior synonym** of *X. subsinuatus* Pic. Nine species are redescribed: *X. anthracinus*, *X. bicolor* Pic, *X. globipennis* Reitter, *X. hypocritus* Mellié, *X. madagascariensis*, *X. nitidissimus*, *X. perforatus* Gerstaecker, *X. subopacus* Pic and *X. subsinuatus*. *X. dentatus* Pic is transferred to *Cis* Latreille with a new name. An identification key to male *Xylographus* of the Afrotropical and Afrotropicate regions is provided, together with the description of external morphology of adults and morphology of male abdominal terminalia. The taxonomic limits, geographic distribution and similarities to other genera are discussed in light of the new data provided here.

Key words: Africa, minute tree-fungus beetles, new species, Orophini.

1. Introduction

Xylographus Mellié is a genus of minute tree-fungus beetles (Coleoptera: Ciidae) with 36 described species, occupying almost all continental and insular lands of tropical and subtropical regions [1–2]. This genus is extremely important due to the large body size of specimens, in comparison to other species of the family, and the great amount of specimens which breed inside a single bracket fungus [3]. Therefore, *Xylographus* species are among the most important consumers of basidiomes of macrofungi, being responsible for the decomposition of large amounts of fungic matter and thus providing various nutrients to terrestrial ecosystems [4]. However, there are no published reviews or synopsis on the genus and identification of its species is very difficult due to the anecdotal original descriptions and absence of identified material in entomological collections [1].

The Afrotropical and Afrotropical regions have the highest diversity of *Xylographus* with 17 described species, including continental and insular lands: *X. anthracinus* Mellié, 1849; *X. bicolor* Pic, 1916; *X. dentatus* Pic, 1922; *X. eichelbaumi* Reitter, 1908; *X. globipennis* Reitter, 1911; *X. hypocritus* Mellié, 1849; *X. longicollis* Pic, 1922; *X. madagascariensis* Mellié, 1849; *X. nitidissimus* Pic, 1916; *X. perforatus* Gerstaecker, 1871; *X. rufescens* Pic, 1921; *X. rufipennis* Pic, 1934; *X. seychellensis* Scott, 1926; *X. subopacus* Pic, 1929; *X. subsinuatus* Pic, 1916; *X. tarsalis* Fåhraeus, 1871 and *X. testaceitarsis* Pic, 1916. These species were described in scattered works by Fåhraeus [5], Gerstaecker [6], Mellié [7], Pic [8–13] and Reitter [14–15]. Most descriptions are very brief and based on a single specimen; therefore it is possible that some of them constitute synonyms of species previously proposed by other authors [1].

In this work, we revise all the Afrotropical and Afrotropical species of *Xylographus* based on morphology and morphometrics of lectotypes, here designated, or holotypes and a series of specimens of other localities, and dissection and study of their male abdominal terminalia. We describe seven new species, synonymise seven species, redescribe nine species and transfer one species to *Cis* Latreille. The morphology, host-use and geographic distribution of *Xylographus* in the Afrotropical and Afrotropical regions are briefly discussed in light of the new information provided here.

2. Material and methods

Comparison of specimens, measurements, descriptions and digital photographs of general external morphology were made under a Zeiss Discovery V8 stereomicroscope and a Zeiss AxioCam MRc digital camera. Final images of specimens were the result of joining about 50 photographs in different focus using the extended focus module of Zeiss AxioVision 4.8 software. Whole mount preparations and photographs of male abdominal terminalia followed the protocol described by Lopes-Andrade [16], and photographs were taken in a Zeiss AxioLab A1 compound microscope equipped with a Zeiss AxioCam Erc 5S digital camera. In some cases, pictures and measurements of type-material and other historical specimens, not available for loan from a few museums, were taken with equipments provided there.

All redescriptions were based on their respective lectotypes males, here designated, except for *X. subopacus*, which lectotype is a female and thus a plesiotype male (sensu Evenhuis [17]) was used to redescribe it. Syntypes of species treated in the present work were all labeled as lectotypes and paralectotypes by John F. Lawrence, but they were not officially designated in the literature. We preferred to maintain Lawrence's labels to avoid future inconsistencies.

Most holotypes and lectotypes were not dissected and descriptions of male abdominal terminalia were based on a paratype, paralectotype, plesiotype or a specimen compared to the type-series. Lectotypes of *X. bicolor* and *X. madagascariensis*, and the holotype of one of the new species (*Xylographus* sp. nov. 4) were dissected to clarify doubts on species limits or, in the case of the new species, in the absence of another male. In some cases one or several segments of male abdominal terminalia were damaged, so pictures of corresponding segments of other specimens compared to the type-series are shown in the plates. When possible, aedeagus and penis were extracted from different specimens (indicated in figure legends).

Terms for external morphology and male abdominal terminalia of ciids are based mostly on the ones provided by Lopes-Andrade and Lawrence [18]. Measurements provided in the redescriptions and descriptions of new species are those of the lectotype, plesiotype or holotype. A maximum of ten males and ten females available from each

locality for each species were measured. When the size of specimens from each locality was visually different, specimens from each distinguishable size category were arbitrarily chosen. Range, mean and standard deviation are given for measurements and ratios. All measurements are given in millimeters. The following abbreviations are used for measurements and ratios: BW, basal width of the scutellum; CL, length of the antennal club (corresponding to antennomeres eight to ten); EL, elytral length (median length from base of scutellum to elytral apex); EW, greatest elytral width; FL, length of the antennal funicle (corresponding to antennomeres three to seven); GD, greatest depth of the body (from elytra to metaventrite); GW, greatest width of the eye; PL, pronotal length along midline; PW, greatest pronotal width; TL, total length (EL+PL; head not included). The ratio GD/EW was taken as an indication of degree of convexity; TL/EW indicates degree of body elongation. Differences among specimens are given in the section on “Variation”, together with range, mean and standard deviation for measurements and ratios.

The identification key was elaborated for male specimens. Distribution maps (Figs. 49–53) were made using latitude and longitude coordinates written on labels or estimated by tracking localities in the online database GeoNames [19]. Coordinates were plotted in maps using the software ArcGis 9.3. Host fungi records are restricted to those written on labels of some specimens or found in literature, and the names were updated after consulting the online database Index Fungorum [20].

Adult beetles examined for this work, about 1200 specimens, belong to the following 13 scientific collections (with acronyms used in this paper):

BMNH	The Natural History Museum (London, United Kingdom).
FMNH	The Field Museum of Natural History (Chicago, IL, USA).
HNHM	Hungarian Natural History Museum (Budapest, Hungary).
KMMA	Koninklijk Museum voor Midden Afrika (Tervuren, Belgium).
LAPC	Cristiano Lopes-Andrade Private Collection (Viçosa, MG, Brazil).
MCZ	Museum of Comparative Zoology, Harvard University (Cambridge, MA, USA).
MHNG	Muséum d'Histoire Naturelle de la Ville de Genève (Geneva, Switzerland).

MNHN	Muséum National d'Histoire Naturelle (Paris, France).
MFNB	Museum für Naturkunde Berlin (Berlin, Germany).
NHRS	Naturhistoriska Riksmuseet (Stockholm, Sweden).
NMW	Naturhistorisches Museum Wien (Wien, Austria).
SANC	South African National Collection of Insects (Pretoria, South Africa).
SNSD	Senckenberg Naturhistorische Sammlungen Dresden (Dresden, Germany).

3. Systematics

Order COLEOPTERA Linnaeus, 1758

Suborder POLYPHAGA Emery, 1886

Superfamily TENEBRIONOIDEA Latreille, 1802

Family CIIDAE Leach, 1819

Subfamily CIINAE Leach, 1819

Tribe OROPHIINI Thomson, 1863

Genus **Xylographus** Mellié, 1847

3.1. Diagnosis of the genus

Adult members of this genus may be distinguished from other Ciidae by the combination of the following features: robust convex blackish body (Fig. 1A–C); left mandible usually bearing an upward tooth in males (Fig. 1B, arrow); first labial palpomere elongate, being almost as long or longer than the second palpomere; antennal club robust, in which each antennomere has a sinuous row of erect setae that divides it in an upper region bearing four conspicuous sensillifers symmetrically positioned and a lower region with scale-like cuticle; each antennal sensillifer formed by a group of short setae arranged in concentric layers; pronotum with dual punctation, consisting of scarce minute punctures about a third the size of the largest ones and devoid of setae (barely visible even in high magnifications (>80X)), and uniformly distributed fine, coarse or transversely stretch punctures; females' pronotal punctation usually coarser and denser than that of males, and with irregular transversely stretch punctures; tibiae expanded, with a row of teeth along their entire outer margin; eight abdominal sternite of males

with a short median strut in the anterior margin; penis usually with a ventral sclerotized lobe forming a well-developed arch (Fig. 36E, arrow); reduced female abdominal terminalia, with gonostyli reduced or absent, gonocoxites transversely divided in no more than two parts, paraprocts very reduced, apex of proctiger close to apex of vagina, and baculi of each side of paraprocts and proctiger usually contiguous and broadly curved.

3.2. Taxonomic synopsis, Afrotropical and Afrotropical fauna

Xylographus anthracinus Mellié, 1849

Xylographus testaceitarsis Pic, 1916, **new junior synonym**

Xylographus bicolor Pic, 1916

Xylographus globipennis Reitter, 1911

Xylographus hypocritus Mellié, 1849

Xylographus madagascariensis Mellié, 1849

Xylographus seychellensis Scott, 1926, **new junior synonym**

Xylographus tarsalis Fahraeus, 1871, **new junior synonym**

Xylographus eichelbaumi Reitter, 1908, **new junior synonym**

Xylographus rufipennis Pic, 1934, **new junior synonym**

Xylographus nitidissimus Pic, 1916

Xylographus longicollis Pic, 1922, **new junior synonym**

Xylographus perforatus Gerstaecker, 1871

Xylographus subopacus Pic, 1929

Xylographus subsinuatus Pic, 1916

Xylographus rufescens Pic, 1921, **new junior synonym**

New species³

Xylographus **sp. nov. 01**

Xylographus **sp. nov. 02**

Xylographus **sp. nov. 03**

Xylographus **sp. nov. 04**

³ New specific epithets are not provided here to avoid nomenclatural inconsistencies, because this thesis shall not be regarded as a valid publication for purposes of zoological nomenclature (International Code of Zoological Nomenclature, Chapter 3, Arts 8.2 and 8.3).

Xylographus **sp. nov. 05**

Xylographus **sp. nov. 06**

Xylographus **sp. nov. 07**

Excluded species⁴

Cis *** **nom. nov.**

Xylographus dentatus Pic, 1922, not *Cis dentatus* Mellié, 1849.

3.3. Species accounts

***Xylographus anthracinus* Mellié, 1849**

(Figs 1–4)

Xylographus anthracinus Mellié 1849: 222. Type locality: Madagascar.

Xylographus testaceitarsis Pic 1916: 13. **New junior synonym** (Figs 4D–F). Type locality: Madagascar, Mahatsinjo, near Tananarive.

Diagnosis: Males with median-sized body (TL 3.70–5.05); dorsal vestiture consisting of minute setae, shorter than a puncture-width. Left mandible bearing an upward tooth. Pronotum and elytra with fine punctation. Anterior edge of pronotum with its median portion projected forward, its anteriormost margin being rounded, slightly sinuated, straight or angulated at middle forming two angulated lateral lobes; lateral margins distinctly arched inward (Figs 3B,E; 4B, arrows). Penis subtriangular, less than half the length of tegmen; dorsal membranous lobe forming an acute apex; sclerotized arch of the ventral lobe about a half the length of the penis, forming a subtriangular apex; anterior edge with a couple of struts forming a V-shaped emargination.

Redescription: **male lectotype** (Figs 1A–C). Measurements: TL 4.49, PL 1.82, PW 2.18, EL 2.67, EW 2.26, GD 2.16. Ratios: PL/PW 0.83, EL/EW 1.18, EL/PL 1.47, GD/EW 0.96, TL/EW 1.99. **Body** elongate, robust, subcylindrical and strongly convex;

⁴ New specific epithet is not provided here to avoid nomenclatural inconsistencies, because this thesis shall not be regarded as a valid publication for purposes of zoological nomenclature (International Code of Zoological Nomenclature, Chapter 3, Arts 8.2 and 8.3).

dorsal and ventral surfaces blackish and shiny; mouthparts, tarsi and antennae reddish-brown; dorsal surface glabrous. **Head** concave, hidden partially by the pronotum; punctation shallow, sparse, with microreticulate sculpture between punctures; dorsal surface mostly glabrous, but with erect yellowish bristles mainly near each eye and over the labrum; frontoclypeal ridge sinuous, the sides slightly projected forward and upward; each lateral margin of vertex just behind the eye elevated into a subtriangular tubercle. **Mouthparts** with distinct asymmetric mandibles, in which the left mandible bears a conspicuous tooth directed upward (Fig. 1B, arrow); labrum protruding. **Eyes** coarsely faceted with GW of 0.25 mm. Each **antenna** with ten antennomeres (right antenna measured; FL 0.23, CL 0.26, CL/FL 1.13), light colored at base; length of antennomeres one to ten as follows: 0.16, 0.07, 0.1, 0.04, 0.04, 0.03, 0.02, 0.07, 0.07, 0.12; antennal club robust, in which each antennomere has a sinuous row of erect setae that divides it in an upper region bearing four conspicuous sensillifers symmetrically positioned and a lower region with scale-like cuticle; each antennal sensillifer formed by a group of short setae arranged in concentric layers. **Pronotum** with dual punctation, consisting of scarce minute punctures about a third the size of the largest ones and devoid of setae, barely visible even in high magnifications (>80X), and uniformly distributed fine punctures; distance between fine punctures from 3 to 4.5 puncture-widths; in between punctures microreticulated and shiny; each fine puncture bearing a yellowish decumbent minute seta; anterior edge with its median portion forming a projection, its anteriormost margin straight and its lateral margins distinctly arched inward; anterolateral angles rounded, not produced; lateral margins not visible from above, with a few long erect yellowish setae along them. **Scutelum** with BW of 0.15 mm, subtriangular, smooth and shiny. **Elytra** with similar punctation but slightly denser than that of pronotum; vestiture consisting of minute fine decumbent yellowish setae; surface between punctures smooth and shiny; lateral and posterolateral margins carinated, broadly rounded, with long erect yellowish setae, not visible from above. **Hind wings** developed (macropterous). **Ventral sclerites** (Fig. 1C) with most of their surfaces finely reticulate and vestiture of decumbent slender setae. **Prosternal disc** concave in front of coxae, finely reticulate, devoid of carina at the longitudinal midline; prosternal process very short, laminate, acute at apex. **Metaventricle** moderately convex, with disc almost glabrous; lateral sides with coarse, irregular, sparse punctation; discrimen indiscernible. **Abdominal ventrites** 1.24 mm long at midline; vestiture of sparse slender setae; shallow and sparse punctures; length of the abdominal ventrites

one to five (from base to apex at the longitudinal midline) as follows: 0.37, 0.2, 0.18, 0.17, 0.32; first abdominal ventrite with a basal width of 1.5 mm and bearing a margined, circular setose sex patch (Fig. 1C, arrow) located at its middle, the patch with a transverse diameter of 0.07 mm. **Tibiae** expanded and with a row of teeth along their entire outer margin; protibia with an area of long slender yellowish setae concentrated at its inner surface. **Abdominal terminalia** in a paralectotype (Figs 2A–F, unless otherwise specified in the legend): **Ninth segment** (Fig. 2C) V-shaped with an erect seta at each apex. **Eight tergite** (Fig. 2A) with posterior margin rounded, bearing long bristles; lateral margins subparallel; anterior margin concave, slightly sclerotized at sides. **Eight sternite** (Fig. 2B) with posterior margin rounded, bearing few long curved bristles at its sides; lateral margins contiguous to the posterior margin, forming a thin projection on each side; anterior margin biconcave, rounded and sclerotized at middle, forming a short median strut. **Aedeagus** (Fig. 2D) about 2.5x as long as wide. **Basal piece** (Fig. 2F) subtriangular, membranous, with rounded angles; posterior margin arched inward forming two lateral lobes. **Tegmen** (Fig. 2D, dotted lines) twice as wide and 2.5x as long as penis, with anterior portion subtriangular; lateral margins subparallel, slightly diverging to apex; posterior portion of its ventral surface with a V-shaped emargination of about one-fifth the length of tegmen, forming two lateral lobes, each lobe with a patch of sensillae at the apex. **Penis** (Fig. 2E) subtriangular (excluding the struts on its anterior border), about 1.5x as long as wide, divided into a long dorsal membranous lobe and a short ventral sclerotized lobe of about a half the length of the penis; membranous lobe forming a sharpen angle on its apex with a row of sensillae along each side of the ejaculatory duct; sclerotized arch of the ventral lobe forming a subtriangular apex; convex lateral margins converging to apex; anterior edge with a couple of struts forming a V-shaped emargination.

Variation: males, measurements (n = 28, including the lectotype): TL 3.70–5.05 (4.33 ± 0.29); PL 1.40–2.00 (1.74 ± 0.14); PW 1.75–2.41 (2.10 ± 0.15); EL 2.20–3.05 (2.56 ± 0.16); EW 2.00–2.60 (2.27 ± 0.13); GD 1.80–2.50 (2.05 ± 0.14). Ratios: PL/PW 0.77–0.94 (0.83 ± 0.04); EL/EW 1.05–1.19 (1.13 ± 0.04); EL/PL 1.32–1.65 (1.48 ± 0.09); GD/EW 0.84–0.98 (0.90 ± 0.03); TL/EW 1.80–2.00 (1.89 ± 0.06). Head more concave and with comparatively finer punctation in large and median-sized males, and flat with sparse punctures in small males; lateral tubercles above the eyes less elevated to absent in small males; the length of the elevated tooth of the left mandible varies in

proportion to the length of the specimen, so that large males usually have longer tooth than small males; anterior edge of pronotum with its median portion strongly projected forward, slightly turned upward, its anteriormost margin angulated at middle forming two angulated lateral lobes in large-sized males (Figs 3A–C); straight or slightly sinuated in median-sized males (Figs 3D–F) and rounded and slightly produced in small-sized males (Fig. 4A–C), making the smallest males morphologically similar to females. Females (Figs 1D–F), measurements (n = 26): TL 3.75–4.50 (4.14 ± 0.17); PL 1.58–1.85 (1.71 ± 0.09); PW 1.75–2.10 (1.98 ± 0.08); EL 2.15–2.57 (2.40 ± 0.13); EW 1.95–2.27 (2.15 ± 0.09); GD 1.80–2.09 (1.95 ± 0.09). Ratios: PL/PW 0.78–0.92 (0.86 ± 0.05); EL/EW 1.04–1.21 (1.11 ± 0.05); EL/PL 1.25–1.62 (1.41 ± 0.11); GD/EW 0.84–0.96 (0.90 ± 0.03); TL/EW 1.77–2.00 (1.91 ± 0.07). Similar to males except in the following features: abdominal sex patch absent; head flat, punctation comparatively coarser; left mandible devoid of projected tooth; anterior edge of pronotum rounded, not produced; anterior portion of pronotum with transversely stretched punctation. Female abdominal terminalia not examined.

Type material: MADAGASCAR: male lectotype (MNHN), **here designated** \Anthracinus Dup. Madagascar.[handwritten]\ Ex-Musæo Mniszech [printed]\ [red label] LECTOTYPE Xylographus anthracinus Mellié [handwritten]; 2 females paralectotypes (MNHN) \anthracinus (ex coll. Chev.) [handwritten]\ Mellié vidit [handwritten]\ [yellow label] PARALECTOTYPE Xylographus anthracinus Mellié [handwritten]; 2 males paralectotypes (MHNG) \Coll. Melly [printed]\ [yellow label] PARALECTOTYPE Xylographus anthracinus Mellié [handwritten].

Additional material: 75 specimens. MADAGASCAR: male lectotype (MNHN) of Xylographus testaceitarsis Pic 1916, **here designated** \MAHATSINJO près Tananarive [printed]\ Type [handwritten]\ testaceitarsis Pic [handwritten]\ [red label] LECTOTYPE Xylographus testaceitarsis Pic [handwritten]; 1 male, 3 females paralectotypes (MNHN) of Xylographus testaceitarsis Pic 1916 \MAHATSINJO près Tananarive [printed]\ [yellow label] PARALECTOTYPE Xylographus testaceitarsis Pic [handwritten]; 1 female (LAPC) \COLL. MUS. TERVUREN N. E. Madagascar: Ambodivoangy VIII.1961 J. Vadon [printed]; 1 male (MNHN)\ ex Maublomi provenance? [handwritten]\ Ganoderma applanatum [handwritten]\ Xylographus anthracinus prob. (inmature) [handwritten]; 3 males, 3 females (MNHN) \MUSEUM

PARIS MADAGASCAR GOUDOT 1834 [printed] \ [circumference label] 4177 34 [handwritten] \ Madagascar 169 [handwritten] \ *Xylographus anthracinus* Mellié Madagascar [handwritten]; 1 male (MHNG) \ *Hypocrita* Dup. Madagascar [handwritten] Collⁿ. Gory. [printed]; 3 males, 6 females (MHNG) \ MADAGASCAR Antiranana prov. Ambohitra 30.11.-2.12.1996 Ivo Jeniš leg. [printed]; 2 males, 1 female (MNHN) \ Madagascar Diego-Suarez Ch. Alluaud 1893 [printed] \ *Xylographus anthracinus* Madagascar [handwritten]; 26 males, 18 females (MNHN) \ *Xylographus anthracinus* Mellié [handwritten] P. Lesne vid. [printed]; 3 males, 2 females (MFNB) \ Madagascar Goudot S. [printed] \ 48446 [handwritten] \ Hist.-Coll. (Coleoptera) Nr. 48446 (1.-5. Ex) *Xylographus* spec. Madagascar, Goudot Zool. Mus. Berlin [printed] \.

Host fungi: one specimen was collected on *Ganoderma applanatum* (Pers.) Pat. 1887 (Polyporales: Ganodermataceae).

Distribution: Madagascar (Fig. 50).

***Xylographus bicolor* Pic, 1916**

(Figs 5–7)

Xylographus bicolor Pic 1916: 13. Type locality: Madagascar, Mahatsinjo, near Tananarive.

Diagnosis: Males with small-sized body (TL 2.91–3.56); dorsal vestiture consisting of minute setae, shorter than a puncture-width. Left mandible bearing an upward tooth. Pronotum and elytra with fine punctation. Anterior edge of pronotum with its median portion projected forward, its anteriormost margin being rounded, straight or angulated at middle forming two angulated lateral lobes; lateral margins distinctly arched inward. Penis subtriangular, less than half the length of tegmen; dorsal membranous lobe forming an acute apex; sclerotized arch of the ventral lobe about a half the length of the penis, shorter than the dorsal lobe; anterior edge with a couple of struts, forming a V-shaped emargination.

Redescription: **male lectotype** (Figs 5A–C). Measurements: TL 3.56, PL 1.40, PW 1.80, EL 2.16, EW 1.87, GD 1.69. Ratios: PL/PW 0.78, EL/EW 1.16, EL/PL 1.54, GD/EW 0.90, TL/EW 1.90. **Body** elongate, subcylindrical and convex; dorsal and ventral surfaces blackish shiny; mouthparts, tarsi and antennae reddish-brown; dorsal surface glabrous. **Head** concave, hidden partially by the pronotum; punctation shallow, sparse, with microreticulate sculpture between punctures; each puncture bearing a yellowish decumbent minute seta; dorsal surface glabrous, but with erect yellowish bristles mainly near each eye and over the labrum; frontoclypeal ridge sinuous, the sides slightly projected forward and upward; each lateral margin of vertex just behind the eye elevated into a subtriangular tubercle. **Mouthparts** with distinct asymmetric mandibles, in which the left mandible bears a conspicuous tooth directed upward (Fig. 5B, arrow); labrum protruding. **Eyes** coarsely faceted with GW of 0.24 mm. Each **antenna** with ten antennomeres (left antenna measured; FL 0.17 CL 0.28, CL/FL 1.65), light colored at base; length of antennomeres one to ten as follows: 0.14, 0.06, 0.07, 0.03, 0.02, 0.02, 0.03, 0.09, 0.08, 0.11; antennal club robust, in which each antennomere has a sinuous row of erect setae that divides it in an upper region bearing four conspicuous sensillifers symmetrically positioned and a lower region with scale-like cuticle; each antennal sensillifer formed by a group of short setae arranged in concentric layers. **Pronotum** with dual punctation, consisting of scarce minute punctures of about a third the size of the largest ones and devoid of setae, barely visible even in high magnifications (>80X), and uniformly distributed fine punctures; distance between fine punctures from 2 to 3.5 puncture-widths; in between punctures microreticulated and shiny; each fine puncture bearing a yellowish decumbent minute seta; anterior edge with its median portion forming a projection, its anteriormost margin straight and its lateral margins distinctly arched inward; anterolateral angles rounded, not produced; lateral margins not visible from above, with a few long erect yellowish setae along them. **Scutelum** with BW of 0.13 mm, subtriangular, smooth and shiny. **Elytra** with similar punctation but slightly shallower and sparser than that of pronotum; vestiture consisting of minute fine decumbent yellowish setae; surface between punctures smooth and shiny; lateral and posterolateral margins carinated, broadly rounded, with long erect yellowish setae, barely visible from above. **Hind wings** developed (macropterous). **Ventral sclerites** (Fig. 5C) with most of their surfaces finely reticulate and vestiture of decumbent slender yellowish setae. **Prosternal disc** concave in front of coxae, finely reticulate, devoid of carina at the longitudinal midline; prosternal process very short, laminate, acute at apex.

Metaventricle moderately convex, with disc almost glabrous; lateral sides with coarse, irregular, sparse punctation; discrimen indiscernible. **Abdominal ventrites** 1.03 mm long at midline; vestiture of sparse slender setae; shallow and sparse punctures; length of the abdominal ventrites one to five (from base to apex at the longitudinal midline) as follows: 0.39, 0.14, 0.14, 0.15, 0.21; first abdominal ventrite with a basal width of 1.27 mm and bearing a margined, circular setose sex patch (Fig. 5C, arrow) located at its middle, the patch with a transverse diameter of 0.03 mm. **Tibiae** expanded and with a row of teeth along their entire outer margin; protibia with an area of long slender yellowish setae concentrated at its inner surface. **Abdominal terminalia** in lectotype (Figs 6A–F, unless otherwise specified in the legend): **Ninth segment** (Fig. 6D) V-shaped with an erect seta at each apex. **Eight tergite** (Fig. 6A) with posterior margin rounded, bearing long bristles; lateral margins diverging; anterior margin concave, slightly sclerotized at sides. **Eight sternite** (Fig. 6B) with posterior margin rounded, bearing few long curved bristles at sides; lateral margins contiguous to the posterior margin, forming a thin projection on each side; anterior margin biconcave, rounded and sclerotized at middle, forming a short median strut. **Aedeagus** (Fig. 6C) about 3x as long as wide. **Basal piece** (Fig. 6F) subtriangular, membranous, with rounded angles. **Tegmen** (Fig. 6C, dotted lines) twice as wide and 2.5x as long as penis, with anterior portion subtriangular; lateral margins subparallel, slightly diverging to apex; posterior portion of its ventral surface with a V-shaped emargination of about one-sixth the length of tegmen, forming two lateral rounded lobes, each lobe with a patch of sensillae at the apex. **Penis** (Fig. 6E) subtriangular (excluding the struts on its anterior border), about twice as long as wide, divided into a long dorsal membranous lobe and a short ventral well-sclerotized lobe of about a half the length of the penis; membranous lobe forming a sharpen angle on its apex with a row of sensillae along each side of the ejaculatory duct; sclerotized arch of the ventral lobe rounded; convex lateral margins converging to apex; anterior edge with a couple of struts forming a V-shaped emargination.

Variation: males, measurements (n = 8, including the lectotype): TL 2.91–3.56 (3.16 ± 0.20); PL 1.15–1.40 (1.27 ± 0.10); PW 1.45–1.80 (1.58 ± 0.13); EL 1.76–2.16 (1.90 ± 0.16); EW 1.56–1.87 (1.67 ± 0.11); GD 1.35–1.69 (1.50 ± 0.14). Ratios: PL/PW 0.77–0.90 (0.81 ± 0.05); EL/EW 1.07–1.19 (1.14 ± 0.04); EL/PL 1.33–1.59 (1.49 ± 0.09); GD/EW 0.84–0.96 (0.90 ± 0.05); TL/EW 1.76–1.97 (1.90 ± 0.08). Head more concave and with comparatively finer punctation in large-sized and median-sized males, and flat

with sparse punctures in small males; lateral tubercles above the eyes less elevated to absent in small males; the length and thickness of the elevated tooth of the left mandible varies in proportion to the length of the specimen; small males have smallest and thinnest mandibular tooth; anterior edge of pronotum with its median portion strongly projected forward, slightly turned upward, its anteriormost margin angulated at middle forming two angulated lateral lobes or a straight projection in large and median-sized males (Figs 3A–C) and rounded and slightly produced in small males (Fig. 7D–F), making the smallest males morphologically similar to females. Females (Figs 5D–F), measurements (n = 15): TL 2.52–4.12 (2.98 ± 0.43); PL 1.00–1.74 (1.26 ± 0.21); PW 1.25–2.07 (1.50 ± 0.23); EL 1.48–2.38 (1.72 ± 0.27); EW 1.38–2.17 (1.61 ± 0.23); GD 1.24–2.10 (1.51 ± 0.26). Ratios: PL/PW 0.75–0.94 (0.84 ± 0.06); EL/EW 0.97–1.20 (1.07 ± 0.06); EL/PL 1.11–1.58 (1.38 ± 0.14); GD/EW 0.88–1.01 (0.93 ± 0.04); TL/EW 1.77–2.00 (1.85 ± 0.06). Similar to males except in the following features: abdominal sex patch absent; head flat, punctation comparatively coarser; left mandible devoid of projected tooth; anterior edge of pronotum rounded, not produced; anterior portion of pronotum with dense transversely stretched punctation. Female abdominal terminalia not examined.

Type material: MADAGASCAR: male lectotype (MNHN), **here designated** \MAHATSINJO près Tananarive [printed] \ Type [handwritten] \ bicolor Pic [handwritten] \ [red label] LECTOTYPE *Xylographus bicolor* Pic [handwritten] \.

Additional material: 22 specimens. MADAGASCAR: 1 female (LAPC) \MADAGASCAR Analamazaotra env. E of Moramanga 5.-11.12.1996 Jin Stolarczyk leg. [printed] \ *Xylographus madagascariensis* Mellié, 1848 C. Lopes-Andrade det. 2002 [handwritten]; 4 males, 2 females (MNHN) \DIEGO SUAREZ [printed] \ *madagascariensis* probable [handwritten]; 3 males, 5 females (MNHN) \Munanyary [unreadable] Madag. [handwritten]; 1 male, 5 females (MHNG) \MADAGASCAR Tamatave distr. Moramanga env. 24.2.-1.3.1995 Ivo Jeniš [printed]; 1 male (MHNG) \MADAGASKAR Fianarantsoa d. Ranomafana env. 28.i.-5.2.1995 Ivo Jeniš leg. [printed] \.

Host fungi: unknown.

Distribution: Madagascar (Fig. 50).

Xylographus globipennis Reitter, 1911

(Figs 8–9)

Xylographus globipennis Reitter 1911: 52. Type locality: Eritrea, Gorbato.

Diagnosis: Males with small-sized body (1.97–2.95); dorsal vestiture dense, consisting of conspicuous long slender yellowish setae. Left mandible bearing an upward tooth. Pronotum and elytra with deep coarse regular punctation. Anterior edge of pronotum with its median portion projected forward, its anterior most margin rounded; lateral margins distinctly straight; both margins coarsely crenulated to smooth. Penis subcylindrical, about three fourths the length of tegmen; dorsal membranous lobe forming an acute apex; ventral membranous lobe about one-third the length of the penis, forming a subtriangular apex; anterior edge with a couple of long struts forming a V-shaped emargination (Sandoval-Gómez et al., 2011)

Redescription (see Sandoval-Gómez et al., 2011): male lectotype (HNHM) (Figs 8A–C, showing the tooth in the left mandible and setose sex patch, arrows); female paralectotype (HNHM) (Figs 8D–F).

Variation: We have found specimens of other localities not reported in the redescription of Sandoval-Gómez et al., 2011, so they were measured and included in this section with the older reports. Males, measurements (n = 52, including the lectotype): TL 1.97–2.95 (2.60 ± 0.20); PL 0.90–1.42 (1.19 ± 0.12); PW 1.02–1.53 (1.30 ± 0.13); EL 1.07–1.66 (1.40 ± 0.13); EW 1.04–1.55 (1.37 ± 0.12); GD 0.94–1.42 (1.22 ± 0.11). Ratios: PL/PW 0.72–1.18 (0.92 ± 0.09); EL/EW 0.88–1.28 (1.03 ± 0.09); EL/PL 0.96–1.58 (1.19 ± 0.14); GD/EW 0.76–1.04 (0.89 ± 0.05); TL/EW 1.64–2.33 (1.90 ± 0.13). Lateral tubercles above the eyes less elevated in small males; the length of the elevated tooth of the left mandible varies in proportion to the length of the specimen, so that large males usually have longer tooth than small males; anterior edge of pronotum with its median portion strongly projected forward, slightly turned upward and strongly crenulated in large-sized males (Figs 9A–C) and median-sized males;

slightly produced and almost without crenulations in small-sized males (Fig. 9D–F). Females, measurements (n = 51): TL 1.33–2.75 (2.42 ± 0.24); PL 0.53–1.47 (1.10 ± 0.14); PW 0.67–1.42 (1.22 ± 0.13); EL 0.80–1.59 (1.32 ± 0.15); EW 0.77–1.53 (1.31 ± 0.14); GD 0.66–1.37 (1.18 ± 0.12). Ratios: PL/PW 0.79–1.14 (0.90 ± 0.07); EL/EW 0.73–1.21 (1.01 ± 0.09); EL/PL 0.67–1.51 (1.22 ± 0.14); GD/EW 0.84–0.98 (0.90 ± 0.04); TL/EW 1.70–2.24 (1.85 ± 0.10).

Material examined: 188 specimens not reported in Sandoval-Gómez et al., 2011. CHAD: 11 specimens (MNHN) \MUSEUM PARIS PAYS SNOUSSI REGION DE NDELÉ MISSION CHARI-TCHAD A. CHEVALIER 1904\. DEMOCRATIC REPUBLIC OF THE CONGO: 1 male, 2 females (MNHN) \BELGIAN CONGO. 18 m S W. of Elizabethville. 30.x.1927. Dr. H. S. Evans. [printed]\ Xylographus [handwritten]; 1 female (MNHN) \BELGIAN CONGO. 18 m S W. of Elizabethville. 17.xi.1927. Dr. H. S. Evans. [printed]\ Xylographus bostrychoides [unreadable] [handwritten]; 1 male, 1 female (MNHN) \BELGIAN CONGO. 18 m S W. of Elizabethville. 1928. Dr. H. S. Evans. [printed]\. ETHIOPIA: 1 female (MNHN) \Abyss. Raffray [printed]\. KENYA: 4 males, 1 female (NHRS) \EAK. Mt. Elgon KAPTECA 1980m T-E Leiler [printed]; 5 males, 3 females, 19 specimens, 8 immatures (NHRS) \Kenya E. Elgon CHEPCHOINA riv. 21.2.1983/ 1950m T-E Leiler [printed]\. MADAGASCAR: 1 male (MNHN) \Mad^{car} [handwritten]\ PIC [handwritten]\. MALI: 1 male, 1 female, 44 specimens (MNHN) \MUSEUM PARIS SOUDAN FRANÇ. A. CHEVALIER 1900 [printed]\. MOZAMBIQUE: 7 males, 9 females, 25 specimens (MNHN) \MUSEUM PARIS MOZAMBIQUE ENV. VILA PERY P. LESNE 1928 [printed]\ SEPTEMBRE [printed]; 7 males, 9 females (MNHN) \MUSEUM PARIS MOZAMBIQUE ENV DE VILA PERY RÉG. DU M^T MALENGE (VANDOUZI) P. LESNE 1928 [printed]\ Dans Polypore (de andouxi?) [handwritten]; 2 females (MNHN) \Nhacansougodi [unreadable] [handwritten]\ Dans un Hexagona (Polyporé) [handwritten]; 1 male, 2 females, 21 specimens (MNHN) \MUSÉUM PARIS ZAMBÉZE N. O. DE TAMBARA NHACANSOUGODI (FIZÉ) P. LESNE 1929 [printed]\. SOUTH AFRICA: 3 males, 1 female, 27 specimens (SANC) \SOUTH AFRICA, Tvl. Swadini, Blydepoort Nat. Res. 24.32S 30.54E. 26-29.i.1987. R. Oberprieler [printed]\ NATIONAL COLL. OF INSECTS Pretoria, S. Afr [printed]\.

Host fungi: some specimens were collected on *Hexagonia* sp. (Polyporales: Polyporaceae).

Distribution: Occurring in temperate and tropical continental Africa, from South Africa, Mozambique, Democratic Republic of the Congo, Kenya, Eritrea, Ethiopia, Chad and Mali. Also known from Madagascar (Fig. 51).

***Xylographus hypocritus* Mellié, 1849**

(Figs 10–12)

Xylographus hypocritus Mellié 1849: 221. Type locality: Madagascar.

Diagnosis: Males with large-sized body (5.35–6.89); dorsal vestiture consisting of minute setae, shorter than a puncture-width. Left mandible bearing a conspicuous curved tooth directed upward. Pronotum and elytra with fine punctation; elytral punctation dense and deep. Anterior edge of pronotum with its median portion projected forward, its anteriormost margin being straight or slightly arched forming two angulated lateral lobes; lateral margins distinctly arched inward. Penis subtriangular, less than half the length of tegmen; dorsal membranous lobe forming an acute apex; ventral membranous lobe about a half the length of the penis, forming a subtriangular apex; anterior edge slightly emarginated at middle, forming a couple of short lateral lobes.

Redescription: **male lectotype** (Figs 10A–C). Measurements: TL 6.89, PL 3.12, PW 3.63, EL 3.77, EW 3.66, GD 3.33. Ratios: PL/PW 0.86, EL/EW 1.03, EL/PL 1.21, GD/EW 0.91, TL/EW 1.88. **Body** elongate, subcylindrical, strongly robust and convex; dorsal and ventral surfaces blackish and shiny; mouthparts, tarsi and antennae reddish-brown; dorsal surface glabrous. **Head** concave, hidden by the pronotum; punctation irregular, consisting of some disperse shallow punctures; dorsal surface completely glabrous; frontoclypeal ridge marginated, prominent in the sides; each lateral margin of vertex just behind the eye elevated into a well-developed subtriangular tubercle. **Mouthparts** with distinct asymmetric mandibles, in which the left mandible bears a conspicuous curved tooth directed upward (Fig. 10B, arrow); mandibles bidentated; ferruginous labrum protruding. **Eyes** coarsely faceted with GW of 0.44 mm. Each

antenna with ten antennomeres (right antenna measured; FL 0.35, CL 0.32, CL/FL 0.91), light colored at base; length of antennomeres one to ten as follows: 0.17, 0.1, 0.13, 0.09, 0.05, 0.04, 0.04, 0.11, 0.09, 0.12; antennal club robust, in which each antennomere has a sinuous row of erect setae that divides it in an upper region bearing four conspicuous sensillifers symmetrically positioned and a lower region with scale-like cuticle; each antennal sensillifer formed by a group of short setae arranged in concentric layers. **Pronotum** with dual punctation, consisting of scarce minute punctures about a third the size of the largest ones and devoid of setae, barely visible even in high magnifications (>80X), and uniformly distributed fine punctures; distance between fine punctures from 2 to 5 puncture-widths; in between punctures microreticulated and shiny; each fine puncture bearing a yellowish decumbent minute seta; anterior edge with its median portion forming a projected and emarginated arc and its lateral portions with a well-depressed sinuosity; anterior edge with its median portion forming a projection, its anteriormost margin straight and its lateral margins distinctly arched inward; anterolateral angles rounded, not produced; lateral margins not visible from above, with a few long erect yellowish setae along them. **Scutelum** with BW of 0.27 mm, subtriangular, smooth and shiny. **Elytra** scarcely longer than the pronotum; punctuation denser and deeper than that of pronotum; vestiture consisting of minute fine decumbent yellowish setae; distance between punctures of one puncture-width; surface between punctures smooth and shiny; lateral and posterolateral margins carinated, broadly rounded, with long decumbent yellowish setae, not visible from above. **Hind wings** developed (macropterous). **Ventral sclerites** (Fig. 10C) with most of their surfaces microreticulate and vestiture of decumbent yellowish slender setae. **Prosternal disc** concave in front of coxae, finely reticulate, devoid of carina at the longitudinal midline; prosternal process very short, laminate, acute at apex. **Metaventricle** moderately convex, with disc covered by some sparse slender setae; lateral sides with shallow, irregular, sparse punctation; discripen indiscernible. **Abdominal ventrites** 1.72 mm long at midline; vestiture of sparse slender setae; coarse and sparse punctures; length of the abdominal ventrites one to five (from base to apex at the longitudinal midline) as follows: 0.78, 0.26, 0.22, 0.18, 0.28; first abdominal ventrite with a basal width of 2.5 mm and bearing a margined, circular setose sex patch (Fig. 10C, arrow) located at its middle, the patch with a transverse diameter of 0.1 mm. **Tibiae** expanded and with a row of teeth along their entire outer margin; protibia with an area of long slender yellowish setae concentrated at its inner surface. **Abdominal terminalia** (Figs

11A–F): **Ninth segment** (Fig. 11C) V-shaped with an erect seta at each expanded apex. **Eight tergite** (Fig. 11A) with posterior margin rounded, bearing long bristles; lateral margins diverging; anterior margin concave, slightly sclerotized at its sides. **Eight sternite** (Fig. 11B) with posterior margin rounded, bearing few long curved bristles at sides; lateral margins contiguous to the posterior margin, forming a thin projection on each side; anterior margin biconcave, rounded and sclerotized at middle, forming a short median strut. **Aedeagus** (Fig. 11D) about 2.5x as long as wide. **Basal piece** (Fig. 11F) subtriangular, membranous, with rounded angles; posterior margin arched inward forming two lateral lobes. **Tegmen** (Fig. 11D, dotted lines) 2.2x as wide and 2.5x as long as penis, with anterior portion subtriangular; lateral margins subparallel, diverging and curving to apex; posterior portion of its ventral surface with a V-shaped emargination of about one-fourth the length of tegmen, forming two lateral lobes, each lobe with a patch of sensillae at the apex. **Penis** (Fig. 11E) subtriangular, about twice as long as wide, divided into a dorsal membranous lobe and a ventral lobe of about a half length of the penis, not sclerotized; dorsal lobe forming a sharpen angle on its apex with a row of sensillae along each side of the ejaculatory duct; ventral membranous lobe forming a subtriangular apex; convex lateral margins converging to apex; anterior edge slightly emarginated at middle, forming a couple of short lateral lobes.

Variation: males, measurements (n = 23, including the lectotype): TL 5.35–6.89 (6.14 ± 0.44); PL 2.30–3.12 (2.71 ± 0.25); PW 2.75–3.63 (3.22 ± 0.25); EL 3.05–3.77 (3.46 ± 0.22); EW 2.85–3.66 (3.29 ± 0.23); GD 2.50–3.33 (2.84 ± 0.25). Ratios: PL/PW 0.75–0.95 (0.84 ± 0.04); EL/EW 1.02–1.15 (1.06 ± 0.03); EL/PL 1.16–1.47 (1.29 ± 0.08); GD/EW 0.79–0.92 (0.87 ± 0.04); TL/EW 1.76–1.95 (1.88 ± 0.05). Head more concave in large and median-sized males, and flat with sparse punctures in small males; lateral tubercles above the eyes less elevated in small males; the length of the elevated tooth of the left mandible varies in proportion to the length of the specimen, so that large males usually have longer tooth than small males; anterior edge of pronotum with its median portion projected forward, slightly turned upward, its anteriormost margin slightly arched forming two angulated lateral lobes in large-sized males (Figs 12A–C) and median-sized males; straight or slightly produced in small-sized males (Fig. 12D–F). Females (Figs 10D–F), measurements (n = 19): TL 5.00–6.25 (5.43 ± 0.29); PL 2.05–2.75 (2.35 ± 0.17); PW 2.55–3.25 (2.81 ± 0.18); EL 2.80–3.50 (3.10 ± 0.17); EW 2.70–3.35 (2.95 ± 0.17); GD 2.35–2.86 (2.57 ± 0.16). Ratios: PL/PW 0.79–0.88 (0.83 ±

0.03); EL/EW 0.97–1.11 (1.05 ± 0.04); EL/PL 1.19–1.49 (1.32 ± 0.09); GD/EW 0.80–0.91 (0.86 ± 0.03); TL/EW 1.78–1.89 (1.84 ± 0.04). Similar to males except in the following features: abdominal sex patch absent; head flat with punctation comparatively coarser and denser; left mandible devoid of projected tooth; anterior edge of pronotum rounded, not produced; pronotal punctation coarse and dense, but elytral punctation shallow, fine and sparse. Female abdominal terminalia not examined.

Type material: MADAGASCAR: male lectotype (MNHN), **here designated** \Hypocritus Dup. Madagascar. [handwritten] \ Ex-Musæo Mniszech [printed] \ [red label] LECTOTYPE Xylographus hypocritus Mellié [handwritten]; 1 female paralectotype (MNHN) \ Madagascar [handwritten] \ Ex-Musæo Mniszech [printed] \ [yellow label] PARALECTOTYPE Xylographus hypocritus Mellié [handwritten] \.

Additional material: 40 specimens. MADAGASCAR: 1 female (KMMA) \MUSÉE DU CONGO [printed] Madagascar, (Staudinger) Ex coll. Glermont [handwritten] \ R. DÉT. 2024 M [printed] \ Staud. Madagascar Hta. Berr [handwritten] \ Xylographus anthracinus Mell. [handwritten] \ Xylographus hypocritus C. Lopes-Andrade det 2007 \; 1 male (MHNG) \ Madagascar Klug [handwritten] \; 2 males, 2 females (MFNB) \ Madagascar Goudot [handwritten] \ hypocritus Mellié. [handwritten] \ 48445 [printed] \ Hist.-Coll. (Coleoptera) Nr. 48445 (1-4. Ex) Xylographus hypocritus Mellié Madagascar, Goudot Zool. Mus. Berlin [printed] \; 1 male, 2 females (MNHN) \ MUSEUM PARIS MADAGASCAR GOUDOT 1834 [printed] \ [circumference label] 4177 34 [handwritten] \ 168 [handwritten] \; 1 male (MNHN) \ MUSEUM PARIS MADAGASCAR HUMBLLOT 1885 \ [circumference label] 6186 85 [handwritten] \; 1 male (MNHN) \ Madagascar Antsianaka et lac Alaotra 2e. Trimestre 1889 Perrot Frères [printed] \ MUSEUM PARIS MADAGASCAR Collection Léon Fairmaire 1906 [printed] \ Xylographus hypocrita Mell. [handwritten] P. Lesne vid. [printed] \; 1 male, 2 females (MNHN) \ MADAGASCAR BAIE D'ANTONGIL A. MOCQUERYS 1897 [printed] \ Xylographus hypocrita Mell. [handwritten] P. Lesne vid. [printed] \; 4 males, 1 female (MNHN) \ MUSEUM PARIS MADAGASCAR BAIE D'ANTONGIL A. MOCQUERYS 1898 [printed] \ [blue circumference label] \; 1 female (MNHN) \ Madagascar Antanambé [printed] \ MUSEUM PARIS MADAGASCAR COLL. CH. ALLUAUD 1904 [printed] \; 4 males, 4 females (MNHN) \ MUSEUM PARIS MADAGASCAR Collection Léon Fairmaire 1906 [printed] \ Xylographus hypocritus

Mell. Madag. [handwritten]; 1 male (BMNH) \Tananarivo Madag. [printed]\ Brit. Mus. 1935-471 [handwritten]\ *Xylographus hypocritus* Mell. ? det. J.F. Lawrence [handwritten]; 1 male (MNHN) \MADAGASCAR Tamatave 90 Km NW 21-XI-1949 [handwritten]\ *Xylographus* sp. [handwritten]\ exotiques cornes [handwritten]\ 1 PIC [handwritten]; 1 male (LAPC) \COLL. MUS. TERVUREN N. E. Madagascar: Ambodivoangy X.1959 J. Vadon [printed]; 2 females (KMMA) \Madagascar: Fampanambo I.1961 J. Vadon [printed]; 4 males, 3 females (MHNG) \MADAGASCAR Fianarantsoa distr. Ranomafana env. 28.1.-6.2.1995 Ivo Jeniš leg. [printed].

Host fungi: unknown.

Distribution: Madagascar (Fig. 52).

***Xylographus madagascariensis* Mellié, 1849**

(Figs 13–17)

Xylographus madagascariensis Mellié 1849: 224. Type locality: Madagascar.

Xylographus eichelbaumi Reitter 1908: 119. **New junior synonym** (Figs 17A,D).

Type locality: Tanzania, Amani.

Xylographus rufipennis Pic 1934: 14. **New junior synonym** (Figs 17B–C, 17E–F).

Type locality: Kenya, Gura.

Xylographus seychellensis Scott 1926: 10. **New junior synonym** (Figs 16A,D). Type locality: Seychelles, Mahe.

Xylographus tarsalis Fahraeus 1871: 670. **New junior synonym** (Figs 16B–C, 16E–F). Type locality: South Africa, Caffraria.

Diagnosis: Males with small-sized body (2.36–4.05); vestiture consisting of minute setae, shorter than a puncture-width. Left mandible bearing an upward tooth. Pronotum and elytra with fine punctation; elytral punctation sparse. Anterior edge of pronotum with its median portion conspicuously projected forward, beyond the head in lateral view; its anteriormost margin being rounded, straight, slightly sinuated or angulated at middle forming two rounded lateral lobes; lateral margins distinctly sinuous (Figs

15B,E, arrows). Penis subcylindrical, about three fourths the length of tegmen; dorsal membranous lobe forming an acute apex; ventral membranous lobe about one-third the length of the penis, forming a subtriangular apex; anterior edge with a couple of long struts forming a V-shaped emargination.

Redescription: **male lectotype** (Figs 13A–C). Measurements: TL 2.93, PL 1.16, PW 1.51, EL 1.77, EW 1.68, GD 1.46. Ratios: PL/PW 0.77, EL/EW 1.05, EL/PL 1.53, GD/EW 0.87, TL/EW 1.74. **Body** elongate, robust, subcylindrical and convex; dorsal and ventral surfaces blackish and shiny; mouthparts, legs and antennae reddish-brown; yellowish tarsi; dorsal surface glabrous. **Head** concave, hidden by the pronotum; punctation shallow, sparse, with microreticulate sculpture between punctures; dorsal surface mostly glabrous, with erect yellowish bristles mainly near each eye and over the labrum; frontoclypeal ridge sinuous, the sides slightly projected forward and upward; each lateral margin of vertex just behind the eye elevated into a subtriangular tubercle. **Mouthparts** with distinct asymmetric mandibles, in which the left mandible bears a conspicuous tooth directed upward (Fig. 13B, arrow); labrum protruding. **Eyes** coarsely faceted with GW of 0.21 mm. Each **antenna** with ten antennomeres (right antenna measured; FL 0.14, CL 0.23, CL/FL 1.64), light colored at base; length of antennomeres one to ten as follows: 0.1, 0.06, 0.05, 0.03, 0.03, 0.02, 0.01, 0.07, 0.07, 0.09; antennal club robust, in which each antennomere has a sinuous row of erect setae that divides it in an upper region bearing four conspicuous sensillifers symmetrically positioned and a lower region with scale-like cuticle; each antennal sensillifer formed by a group of short setae arranged in concentric layers. **Pronotum** with dual punctation, consisting of scarce minute punctures about a third the size of the largest ones and devoid of setae, barely visible even in high magnifications (>80X), and uniformly distributed fine punctures; distance between fine punctures from 1.5 to 3 puncture-widths; in between punctures microreticulated and shiny; each fine puncture bearing a yellowish decumbent minute seta; anterior edge with its median portion conspicuously projected forward, beyond the head in lateral view; its anteriormost margin angulate at middle forming two rounded lateral lobes and its lateral margins distinctly sinuous; anterolateral angles rounded, not produced; lateral margins not visible from above, with a few long erect yellowish setae along them. **Scutelum** with BW of 0.15 mm, subtriangular, smooth and shiny. **Elytra** with similar punctation but slightly sparser than that of pronotum; vestiture consisting of minute fine decumbent yellowish setae; surface between

punctures smooth and shiny; lateral and posterolateral margins carinated, broadly rounded, with long erect yellowish setae, barely visible from above. **Hind wings** developed (macropterous). **Ventral sclerites** (Fig. 13C) with most of their surfaces finely reticulate and vestiture of decumbent slender setae. **Prosternal disc** concave in front of coxae, finely reticulate, devoid of carina at the longitudinal midline; prosternal process very short, laminate, acute at apex. **Metaventricle** moderately convex, with disc almost glabrous; lateral sides with shallow, irregular, sparse punctation; discrimen indiscernible. **Abdominal ventrites** 0.80 mm long at midline; vestiture of sparse slender setae; shallow and sparse punctures; length of the abdominal ventrites one to five (from base to apex at the longitudinal midline) as follows: 0.35, 0.11, 0.11, 0.11, 0.12; first abdominal ventrite with a basal width of 1.03 mm and bearing a margined, circular setose sex patch (Fig. 13C, arrow) located at its middle, the patch with a transverse diameter of 0.03 mm. **Tibiae** expanded and with a row of teeth along their entire outer margin; protibia with an area of long slender yellowish setae concentrated at its inner surface. **Abdominal terminalia** in lectotype (Figs 14A–F, unless otherwise specified in the legend): **Ninth segment** (Fig. 14C) V-shaped with an erect seta at each expanded apex. **Eight tergite** (Fig. 14A) with posterior margin rounded, bearing long bristles; lateral margins diverging; anterior margin concave, slightly sclerotized at sides. **Eight sternite** (Fig. 14B) with posterior margin rounded, bearing few long curved bristles at sides; lateral margins contiguous to the posterior margin, forming a thin projection on each side; anterior margin biconcave, rounded and sclerotized at middle, forming a short median strut. **Aedeagus** (Fig. 14D) about 3x as long as wide. **Basal piece** (Fig. 14F) subtriangular, membranous, with rounded angles; posterior margin arched inward forming two lateral lobes. **Tegmen** (Fig. 14D, dotted lines) 3x as wide and 1.5x as long as penis, with anterior portion subtriangular; lateral margins subparallel, slightly diverging to apex; posterior portion of its ventral surface with a V-shaped emargination of about one-fourth the length of tegmen, forming two lateral lobes, each lobe with a patch of sensillae at the apex. **Penis** (Fig. 14E) subcylindrical, about 3x as long as wide, divided into a dorsal membranous lobe and a ventral lobe of about one-third the length of the penis, not sclerotized; dorsal lobe forming a sharpen angle on its apex with a row of sensillae along each side of the ejaculatory duct; ventral membranous lobe forming a subtriangular apex; lateral margins converging to apex; anterior edge with a couple of long struts forming a V-shaped emargination.

Variation: males, measurements (n = 23, including the lectotype): TL 2.36–4.05 (3.10 ± 0.42); PL 0.85–1.80 (1.24 ± 0.23); PW 1.20–2.04 (1.60 ± 0.22); EL 1.48–2.29 (1.86 ± 0.22); EW 1.33–2.10 (1.71 ± 0.21); GD 1.18–1.94 (1.58 ± 0.21). Ratios: PL/PW 0.69–0.92 (0.77 ± 0.05); EL/EW 0.95–1.22 (1.09 ± 0.08); EL/PL 1.25–1.98 (1.53 ± 0.18); GD/EW 0.84–1.23 (0.92 ± 0.08); TL/EW 1.65–2.05 (1.81 ± 0.11). Head more concave and with comparatively finer punctation in large and median-sized males, and flat with sparse punctures in small males; lateral tubercles above the eyes less elevated to absent in small males; the length of the elevated tooth of the left mandible varies in proportion to the length of the specimen; small males with tiny mandibular tooth; anterior edge of pronotum strongly projected forward, slightly turned upward, its anteriormost margin angulated at middle forming two rounded lateral lobes (Figs 15A–C) in large-sized males or median-sized males; straight or slightly sinuated in some median-sized males and rounded and slightly produced in small-sized males (Fig. 15D–F), making the smallest males morphologically similar to females. Females (Figs 13D–F), measurements in mm (n = 26): TL 2.20–3.35 (2.88 ± 0.29); PL 0.82–1.45 (1.13 ± 0.15); PW 1.05–1.74 (1.45 ± 0.17); EL 1.38–2.04 (1.75 ± 0.16); EW 1.25–1.89 (1.62 ± 0.18); GD 1.13–1.72 (1.47 ± 0.16). Ratios: PL/PW 0.69–0.95 (0.78 ± 0.06); EL/EW 0.98–1.22 (1.09 ± 0.06); EL/PL 1.31–1.85 (1.57 ± 0.15); GD/EW 0.83–1.03 (0.91 ± 0.05); TL/EW 1.64–1.89 (1.79 ± 0.07). Similar to males except in the following features: abdominal sex patch absent; head flat, punctation comparatively coarser; left mandible devoid of projected tooth; anterior edge of pronotum rounded, not produced; pronotum with regular coarse to transversely stretched coarse punctation. Female abdominal terminalia not examined.

Type material: MADAGASCAR: male lectotype (MNHN), **here designated** \Madagascariensis Dup. Madagascar.[handwritten] \ Ex-Musæo Mniszech [printed] \ [red label] LECTOTYPE *Xylographus madagascariensis* Mellié [handwritten].

Additional material: 52 specimens. KENYA: female lectotype (BMNH) of *Xylographus rufipennis* Pic 1934, **here designated** \Type [printed] \ R. E, DENT GURA R, 7500 AUG 1929 [printed] \ *Xylographus rufipennis* n. sp. [handwritten] \ Pres. By Imp. Inst. Ent B. M. 1934-42. [printed] \ [red label] LECTOTYPE *Xylographus rufipennis* Pic [handwritten]; 1 female paralectotype (MNHN) of *Xylographus rufipennis* Pic 1934 \ R. E, DENT GURA R, 7500 AUG 1929 [printed] \ *Xylographus*

rufipennis n. sp [handwritten]\ ex. British museum [handwritten]\ [yellow label]
 PARALECTOTYPE *Xylographus rufipennis* Pic [handwritten]; 1 male, 5 females
 (NHRS) \EAK. Elgon SUAM sawmill. 2659m 22.2.1983 T-E Leiler [printed].
 SEYCHELLES: male lectotype (BMNH) of *Xylographus seychellensis* Scott 1926,
here designated \LECTOTYPE [printed]\ Mahe, 1908-9 Seychelles Exp. [printed]\
 Percy Sladen Trust Exped. Brit. Mus. 1926-246. [printed]\ *Xylographus seychellensis*,
 Scott TYPE. ♂. [handwritten]\ Figured specimen [printed] (outline whole vis)
 [handwritten]\ TYPE [printed]\ [red label] LECTOTYPE *Xylographus seychellensis*
 Scott [handwritten]. SOUTH AFRICA: male lectotype (NHRS) of *Xylographus*
tarsalis Fahraeus 1871 \Caffraria [printed]\ J. Wahlb. [printed]\ ♂ [printed]\ Lectotype
 ♂ *Xylographus tarsalis* FÅHR. Det. Julio Ferrer 1995 [handwritten]\ Riksmuseum
 Stockholm [printed]; 1 male, 1 female paralectotypes (NHRS) of *Xylographus tarsalis*
Fahraeus 1871 \Caffraria [printed]\ J. Wahlb. [printed]\ Paralectotype *Xylographus*
tarsalis FÅHR. Det. Julio Ferrer 1995 [handwritten]\ Riksmuseum Stockholm
 [printed]; 3 males, 3 females (KMMA) /Mapula Zululand [handwritten]\ COLL. MUS.
 CONGO ex coll. Breuning [printed]\ *Xylographus eichelbaumi* Reit. C. Lopes-Andrade
 det. 2008 [handwritten]; 1 female (KMMA) \ Loulhbroom [unreadable] Natal 18.4.56
 [handwritten]\ COLL. MUS. CONGO ex coll. Breuning [printed]; 1 male (BMNH)
 \Natal: Durvan. 4-IX-1920. Dept. of Agric. [handwritten]\ Pres. by Imp. Bur. Ent. Brit.
 Mus. 1924-51. [printed]\ *tarsalis* Fhs. [handwritten]; 1 female (SANC) \SOUTH
 AFRICA: KZN Monk's Cowl Foothills Drakensberg 29°03'S 29°23'E 24.iii.2008 S. &
 O. C. Nesor [printed]\ Ex bracket fungus on fallen log BF # 64 [printed]\ NATIONAL
 COLL. OF INSECTS Pretoria, South Africa [printed]; 2 females (SANC) \South
 Africa: WCAPE Montagu Pass N of George 33°54'S 22°24'E 4-xi-2009 S. & O. C.
 Nesor. [printed]\ Ex. bracket fungus #210 on fallen tree trunk [printed]\ Ex. bracket
 fungus *Coriolus hirsutus* BF # 210 [printed]\ NATIONAL COLL. OF INSECTS
 Pretoria, South Africa [printed]; 3 males (SANC) \ South Africa: WCAPE Montagu
 Pass N of George 33°54'S 22°24'E 4-xi-2009 S. & O. C. Nesor. [printed]\ Ex. bracket
 fungus #211 on *Brachylaena neriifolia* [printed]\ Ex. bracket fungus *Coriolus hirsutus*
 BF # 211 [printed]\ NATIONAL COLL. OF INSECTS Pretoria, South Africa
 [printed]; 1 female (SANC) \South Africa: MPU Mooihoek Farm nr Wakkerstroom
 27°13'S 30°32'E 15m 15-VII-2008 O. & S. Nesor [printed]\ Ex. bracket fungus
Thelephora sp. BF # 125 [printed]\ Box 3 106-135 SANC [printed]\ NATIONAL
 COLL. OF INSECTS Pretoria, South Africa [printed]; 1 male, 1 female (LAPC)

\R.S.A., East Cape Prov. OLIFANT PASS 800-814m N of Paterson, 26.-28.-XI-2000
 lgt P. Senft [printed]\ *Xylographus* sp. det. Rafal RUTA 2005 [handwritten]\
Xylographus seychellensis Scott C. Lopes-Andrade det. 2007 [handwritten].
 TANZANIA: female holotype (NMW) of *Xylographus eichelbaumi* Reitter 1908 \9
 [handwritten]\ Amani [printed]\ D. O. Afrika Eichelbaum'03 [printed]\ 13.[unreadable]
 1903 in *Fomes nigrolachatus* [handwritten]\ Amani Deutsch Oist afr.[unreadable]
 [handwritten]\ *Xylographus eichelbaumi* m. Typ. 1907. [handwritten]\ [red label]
 HOLOTYPE *Xylographus eichelbaumi* Reitt. [handwritten]\ Eichelbaumi Mambara
 Reitt. [handwritten]\; 1 male (MFNB) \Usambara Derema 850m. Dezember 91 Conradt
 S. [printed]. DEMOCRATIC REPUBLIC OF THE CONGO: 2 males (KMMA)
 \I.R.S.A.C.-MUS. CONGO Kundelungu 1750m. (Gal. forest.) 27-III-1950 N. Leleup
 [printed]\ Récolté dans polypore [printed]\; 3 females (KMMA) \I.R.S.A.C.-MUS.
 CONGO Kundelungu 1750m. (Gal. forest.) 28-III-1950 N. Leleup M.C.5 [printed]\
 Récolté dans polypore [printed]\ Voir 1 ad. et larve? en alcool [handwritten].
 RWANDA: 1 female (MHNG) \RWANDA Rangiro 1800m. 14.IX.76 Werner
 [handwritten]. UGANDA: 6 males, 7 females (KMMA) \COLL. MUS. CONGO
 Uganda: Bugiri, 1400m. savane boisée 5/8-VIII-1957 [printed]\ Mission Zoolog.
 I.R.S.A.C. en Afrique orientale (P. Basilewsky et N. Leleup) [printed]\ Dans polypore
 [printed].

Host fungi: one specimen was collected on *Ganoderma australe* (Fr.) Pat. 1889
 (=Fomes nigrolaccatus (Cooke) Sacc. 1888) (Polyporales: Ganodermataceae); some
 specimens from South Africa were collected on bracket fungus *Trametes hirsuta*
 (Wulfen) Lloyd 1924 (Polyporales: Polyporaceae), *Polyporus* sp. (Polyporales:
 Polyporaceae) and *Thelephora* sp. (Thelephorales: Thelephoraceae).

Distribution: Eastern continental Africa, from Kenya, Uganda, Rwanda, Democratic
 Republic of the Congo, Tanzania and South Africa. Also in Seychelles and Madagascar
 (Fig. 51).

Xylographus nitidissimus Pic, 1916

(Figs 18–21)

Xylographus nitidissimus Pic 1916: 13. Type locality: São Tomé.

Xylographus longicollis Pic 1922: 8. **New junior synonym** (Figs 21A–C). Type locality: Benin, Dahomey.

Diagnosis: Males with median-sized body (4.26–5.65); dorsal vestiture consisting of minute setae, shorter than a puncture-width. Left mandible bearing an upward tooth. Pronotum and elytra with shallow, sparse fine punctation. Anterior edge of pronotum with its median portion projected forward, its anteriormost margin being slightly sinuate, straight or angulated at middle forming two angulated lateral lobes; lateral margins distinctly arched inward. Penis subtriangular, about three fourths the length of tegmen; dorsal membranous lobe forming an acute apex; sclerotized arch of the ventral lobe about a half the length of the penis, forming a subtriangular apex; anterior edge with a couple of struts forming a V-shaped emargination.

Redescription: **male lectotype** (Figs 18A–C). Measurements: TL 4.75, PL 1.97, PW 2.54, EL 2.78, EW 2.68, GD 2.36. Ratios: PL/PW 0.78, EL/EW 1.04, EL/PL 1.41, GD/EW 0.88, TL/EW 1.77. **Body** elongate, subcylindrical and convex; dorsal and lateral surfaces blackish and shiny; ventral surfaces, mouthparts, legs and antennae reddish-brown; yellowish tarsi; dorsal surface glabrous. **Head** concave, hidden partially by the pronotum; punctation shallow, sparse, with microreticulate sculpture between punctures; dorsal surface mostly glabrous, but with few erect yellowish bristles mainly near each eye and over the labrum; frontoclypeal ridge sinuous, the sides slightly projected forward and upward; each lateral margin of vertex just behind the eye elevated into a subtriangular tubercle. **Mouthparts** with distinct asymmetric mandibles, in which the left mandible bears a conspicuous tooth directed upward (Fig. 18B, arrow); labrum protruding. **Eyes** coarsely faceted with GW of 0.36 mm. Each **antenna** with ten antennomeres (right antenna measured; FL 0.27, CL 0.34, CL/FL 1.26), light colored at base; length of antennomeres one to ten as follows: 0.16, 0.06, 0.08, 0.06, 0.05, 0.04, 0.04, 0.1, 0.1, 0.14; antennal club robust, in which each antennomere has a sinuous row of erect setae that divides it in an upper region bearing four conspicuous sensillifers symmetrically positioned and a lower region with scale-like cuticle; each antennal

sensillifer formed by a group of short setae arranged in concentric layers. **Pronotum** with dual punctation, consisting of scarce minute punctures about a third the size of the largest ones and devoid of setae, barely visible even in high magnifications (>80X), and shallow, sparse fine punctures; distance between fine punctures from 2 to 4 puncture-widths; in between punctures slightly microreticulated and shiny; each fine puncture bearing a yellowish decumbent minute seta; anterior edge with its median portion forming a projection, its anteriormost margin straight and its lateral margins distinctly arched inward; anterolateral angles rounded, not produced; lateral margins not visible from above, with a few long erect yellowish setae along them. **Scutelum** with BW of 0.18 mm, subtriangular, smooth and shiny. **Elytra** with similar punctation than that of pronotum; vestiture consisting of minute fine decumbent yellowish setae; surface between punctures smooth and shiny; lateral and posterolateral margins carinated, broadly rounded, with long erect yellowish setae, not visible from above. **Hind wings** developed (macropterous). **Ventral sclerites** (Fig. 18C) with most of their surfaces finely reticulate and vestiture of decumbent slender setae. **Prosternal disc** concave in front of coxae, finely reticulate, devoid of carina at the longitudinal midline; prosternal process very short, laminate, acute at apex. **Metaventricle** moderately convex, with elevated disc almost glabrous; lateral sides finely reticulate; discrimen indiscernible. **Abdominal ventrites** 1.42 mm long at midline; vestiture of sparse slender setae; shallow and sparse punctures; length of the abdominal ventrites one to five (from base to apex at the longitudinal midline) as follows: 0.54, 0.19, 0.18, 0.15, 0.36; first abdominal ventrite with a basal width of 1.82 mm and bearing a margined, circular setose sex patch (Fig. 18C, arrow) located at its middle, the patch with a transverse diameter of 0.09 mm. **Tibiae** expanded and with a row of teeth along their entire outer margin; protibia with an area of long slender yellowish setae concentrated at its inner surface. **Abdominal terminalia** in lectotype (Figs 19A–F, unless otherwise specified in the legend): **Ninth segment** (Fig. 19C) V-shaped with an erect seta at each apex. **Eight tergite** (Fig. 19A) with posterior margin rounded, bearing long bristles; lateral margins diverging; anterior margin concave, slightly sclerotized at sides. **Eight sternite** (Fig. 19B, broken, dashed line) with posterior margin rounded, bearing few long curved bristles at sides; lateral margins contiguous to the posterior margin, forming a thin projection on each side; anterior margin biconcave, rounded and sclerotized at middle, forming a short median strut. **Aedeagus** (Fig. 19D) about 1.5x as long as wide. **Basal piece** (Fig. 19F) subtriangular, membranous, with rounded angles. **Tegmen** (Fig. 19D,

dotted lines) twice as wide and 1.5x as long as penis, with anterior portion width and subtriangular; lateral margins subparallel, slightly diverging to apex; posterior portion of its ventral surface with a V-shaped emargination of about one-fourth the length of tegmen, forming two rounded lateral lobes, each lobe with a patch of sensillae at the apex. **Penis** (Fig. 19E) subtriangular (excluding the struts on its anterior border), about 3x as long as wide, divided into a dorsal membranous lobe and a long ventral sclerotized lobe of about a half the length of the penis; membranous lobe forming a sharpen angle on its apex with a row of sensillae along each side of the ejaculatory duct; sclerotized arch of the ventral lobe forming a subtriangular apex and ultrapassing the top of the dorsal lobe; convex lateral margins converging to apex; anterior edge with a couple of struts forming a V-shaped emargination.

Variation: males, measurements (n = 22, including the lectotype): TL 4.26–5.65 (4.99 ± 0.40); PL 1.72–2.70 (2.12 ± 0.26); PW 2.10–2.85 (2.52 ± 0.22); EL 2.54–3.15 (2.84 ± 0.19); EW 2.25–3.00 (2.67 ± 0.20); GD 2.10–2.71 (2.46 ± 0.18). Ratios: PL/PW 0.75–1.29 (0.85 ± 0.12); EL/EW 1.00–1.23 (1.07 ± 0.05); EL/PL 1.09–1.54 (1.35 ± 0.12); GD/EW 0.78–1.07 (0.92 ± 0.06); TL/EW 1.75–2.35 (1.86 ± 0.13). Head more concave and with comparatively finer punctation in large and median-sized males, and flat with sparse punctures in small males; lateral tubercles above the eyes less elevated in small males; the length of the elevated tooth of the left mandible varies in proportion to the length of the specimen, so that large males usually have longer tooth than small males; anterior edge of pronotum with its median portion strongly projected forward, slightly turned upward, its anteriormost margin angulated at middle forming two angulated lateral lobes in large-sized males (Figs 20A–C); straight or slightly sinuated in median-sized and small-sized males (Fig. 20D–F). Females (Figs 18D–F), measurements (n = 33): TL 3.83–4.88 (4.35 ± 0.29); PL 1.62–2.23 (1.86 ± 0.19); PW 1.73–2.55 (2.12 ± 0.21); EL 2.10–2.71 (2.47 ± 0.19); EW 2.03–2.70 (2.36 ± 0.20); GD 1.50–2.55 (2.16 ± 0.25). Ratios: PL/PW 0.79–0.96 (0.85 ± 0.05); EL/EW 0.94–1.14 (1.06 ± 0.06); EL/PL 1.15–1.54 (1.36 ± 0.13); GD/EW 0.74–1.00 (0.91 ± 0.07); TL/EW 1.75–1.93 (1.84 ± 0.05). Similar to males except in the following features: abdominal sex patch absent; head flat, punctation comparatively denser; left mandible devoid of projected tooth; anterior edge of pronotum rounded, not produced; pronotum with coarse punctation.

Type material: SÃO TOMÉ AND PRÍNCIPE: male lectotype (MNHN) of *Xylographus nitidissimus* Pic 1916, **here designated** \San. Thomé [printed]\ n. sp. [handwritten]\ type [handwritten]\ nitidissimus Pic [handwritten]\ [red label] LECTOTYPE *Xylographus nitidissimus* Pic [handwritten]; 5 males, 4 females paralectotypes (MNHN) of *Xylographus nitidissimus* Pic 1916 \San Thomé [handwritten]\ type [handwritten]\ [yellow label] PARALECTOTYPE *Xylographus nitidissimus* Pic [handwritten];

Additional material: 61 specimens. SÃO TOMÉ AND PRÍNCIPE: 1 males, 2 females (MNHN) \San-Thomé [printed]; 26 males, 29 females (MNHN) \MUSEUM PARIS AFRIQUE OCCID. I. SAN THOMÉ A. MOCQUERYS 1901 [printed]. BENIN: female lectotype (MNHN) of *Xylographus longicollis* Pic, 1922, **here designated** \? Dahomey [handwritten]\ Provenance ? [handwritten]\ longicollis n. sp. [handwritten]\ [red label] LECTOTYPE *Xylographus longicollis* Pic [handwritten]. CAMEROON: 2 females (MNHN) \Kamerun Musake [printed]\ PIC [handwritten].

Host fungi: Unknown.

Distribution: Western tropical Africa from Benin and Cameroon. Also in São Tomé and Príncipe (Fig. 53).

***Xylographus perforatus* Gerstaecker, 1871**

(Figs 22–24)

Xylographus perforatus Gerstaecker 1871: 57. Type locality: Tanzania, Zanzibar.

Diagnosis: Males with median-sized body (3.37–5.13); dorsal vestiture consisting of short erect setae (better seen in lateral view), longer than a puncture-width. Left mandible bearing an upward tooth. Pronotum and elytra with deep coarse punctation; elytral punctation sparse. Anterior edge of pronotum with its median portion projected forward, its anteriormost margin being rounded, slightly sinuated, straight or angulated at middle forming two rounded lateral lobes; lateral margins distinctly arched inward. Penis subtriangular, about three fourths the length of tegmen; dorsal membranous lobe

forming an acute apex; sclerotized arch of the ventral lobe about a third the length of the penis, forming a subtriangular apex; anterior edge slightly emarginated at middle, forming a couple of short lateral lobes.

Redescription: **male lectotype** (Figs 22A–C). Measurements: TL 3.95, PL 1.66, PW 2.01, EL 2.29, EW 2.22, GD 2.09. Ratios: PL/PW 0.83, EL/EW 1.03, EL/PL 1.38, GD/EW 0.94, TL/EW 1.78. **Body** elongate, robust, subcylindrical and convex; dorsal and ventral surfaces blackish and shiny; legs and abdominal ventrites reddish-brown; mouthparts, tarsi and antennae light-brown; dorsal vestiture consisting of short erect setae, longer than a puncture-width. **Head** concave, hidden partially by the pronotum; microreticulate sculpture about its regular and shallow punctures; dorsal surface mostly glabrous, but with erect yellowish bristles mainly near each eye and over the labrum; frontoclypeal ridge sinuous, the sides slightly projected forward and upward; each lateral margin of vertex just behind the eye elevated into a subtriangular tubercle. **Mouthparts** with distinct asymmetric mandibles, in which the left mandible bears a conspicuous tooth directed upward (Fig. 22B, arrow); labrum protruding. **Eyes** coarsely faceted with GW of 0.32 mm. Each **antenna** with ten antennomeres (left antenna measured; FL 0.2, CL 0.21, CL/FL 1.05); length of antennomeres one to ten as follows: 0.16, 0.06, 0.07, 0.04, 0.03, 0.03, 0.03, 0.06, 0.07, 0.08; antennal club robust, in which each antennomere has a sinuous row of long erect setae that divides it in an upper region bearing four conspicuous sensillifers symmetrically positioned and a lower region with scale-like cuticle; each antennal sensillifer formed by a group of short setae arranged in concentric layers. **Pronotum** with dual punctation, consisting of scarce minute punctures about a third the size of the largest ones and devoid of setae, barely visible even in high magnifications (>80X), and uniformly distributed deep coarse punctures; distance between coarse punctures from 0.5 to 1.5 puncture-widths; in between punctures microreticulated and shiny; each coarse puncture bearing a short erect setae (better seen in lateral view), longer than a puncture-width; anterior edge with its median portion forming a projection, its anteriormost margin straight and its lateral margins distinctly arched inward; anterolateral angles rounded, not produced; lateral margins not visible from above, with a few long erect yellowish setae along them. **Scutelum** with BW of 0.13 mm, subtriangular, smooth and shiny. **Elytra** with similar punctation but slightly sparser than that of pronotum; vestiture consisting of short erect setae, longer than a puncture-width; distance between punctures of 1 to 3 puncture-widths; surface

between punctures smooth and shiny; lateral and posterolateral margins emarginated, broadly rounded, with long erect yellowish setae, not visible from above. **Hind wings** developed (macropterous). **Ventral sclerites** (Fig. 22C) with most of their surfaces finely reticulate and vestiture of decumbent slender setae. **Prosternal disc** concave in front of coxae, finely reticulate, devoid of carina at the longitudinal midline; prosternal process very short, laminate, acute at apex. **Metaventricle** moderately convex, with disc almost glabrous; lateral sides with coarse, irregular, sparse punctation; discrimen indiscernible. **Abdominal ventrites** 1.08 mm long at midline; vestiture of sparse erect setae; coarse punctures; length of the abdominal ventrites one to five (from base to apex at the longitudinal midline) as follows: 0.46, 0.14, 0.13, 0.12, 0.23; first abdominal ventrite with a basal width of 1.48 mm and bearing a margined, circular yellowish setose sex patch (Fig. 22C, arrow) located at its middle, the patch with a transverse diameter of 0.09 mm. **Tibiae** expanded and with a row of teeth along their entire outer margin; protibia with an area of long slender yellowish setae concentrated at its inner surface. **Abdominal terminalia** (Figs 23A–F): **Ninth segment** (Fig. 23D) V-shaped with an erect seta at each apex. **Eight tergite** (Fig. 23A) with posterior margin almost straight, bearing long bristles; lateral margins diverging; anterior margin concave, slightly sclerotized at sides. **Eight sternite** (Fig. 23B) with posterior margin rounded, bearing few long curved bristles at sides; lateral margins contiguous to the posterior margin, forming a thin projection on each side; anterior margin biconcave, rounded and sclerotized at middle, forming a short median strut. **Aedeagus** (Fig. 23C) about 1.5x as long as wide. **Basal piece** (Fig. 23F) subtriangular, membranous, with rounded angles; posterior margin arched inward forming two lateral lobes. **Tegmen** (Fig. 23C, dotted lines) twice as wide and 1.5x as long as penis, with anterior portion width and subtriangular; lateral margins subparallel, slightly diverging to apex; posterior portion of its ventral surface with a V-shaped emargination of about one-fourth the length of tegmen, forming two lateral lobes, each lobe with a patch of sensillae at the apex. **Penis** (Fig. 23E) subtriangular, about 1.5x as long as wide, divided into a dorsal membranous lobe and a ventral sclerotized lobe of about a third the length of the penis; membranous lobe forming a sharpen angle on its apex with a row of sensillae along each side of the ejaculatory duct; sclerotized arch of the ventral lobe forming a subtriangular apex; sublateral margins converging to apex; anterior edge slightly emarginated at middle, forming a couple of short lateral lobes.

Variation: males, measurements (n = 22, including the lectotype): TL 3.37–5.13 (4.26 ± 0.44); PL 1.40–2.17 (1.79 ± 0.22); PW 1.72–2.79 (2.19 ± 0.28); EL 1.95–2.96 (2.46 ± 0.27); EW 1.89–2.82 (2.33 ± 0.25); GD 1.65–2.58 (2.13 ± 0.25). Ratios: PL/PW 0.76–0.92 (0.82 ± 0.03); EL/EW 1.00–1.13 (1.06 ± 0.04); EL/PL 1.17–1.56 (1.38 ± 0.09); GD/EW 0.79–0.97 (0.91 ± 0.04); TL/EW 1.76–1.92 (1.83 ± 0.04). Head more concave in large and median-sized males, and flat to convex in small males; lateral tubercles above the eyes less elevated to absent in small males; the length of the elevated tooth of the left mandible varies in proportion to the length of the specimen, so that large males usually have longer tooth than small males; some small males with a tiny tooth; anterior edge of pronotum with its median portion strongly projected forward, slightly turned upward, its anteriormost margin angulated at middle forming two rounded lateral lobes in large-sized males (Figs 24A–C); straight or slightly sinuated in median-sized males (Figs 22A–C) and rounded in small-sized males (Fig. 24D–F), making the smallest males morphologically similar to females. Females (Figs 22D–F), measurements (n = 21): TL 3.45–4.65 (4.00 ± 0.34); PL 1.45–2.01 (1.72 ± 0.18); PW 1.68–2.31 (2.00 ± 0.18); EL 1.95–2.78 (2.28 ± 0.20); EW 1.86–2.51 (2.16 ± 0.19); GD 1.62–2.31 (1.98 ± 0.21). Ratios: PL/PW 0.78–0.93 (0.86 ± 0.04); EL/EW 0.94–1.18 (1.06 ± 0.06); EL/PL 1.14–1.54 (1.33 ± 0.11); GD/EW 0.75–1.02 (0.92 ± 0.06); TL/EW 1.73–2.00 (1.85 ± 0.06). Similar to males except in the following features: abdominal sex patch absent; head flat, punctation comparatively denser; left mandible devoid of projected tooth; anterior edge of pronotum rounded, marginated; sculpture of pronotum with coarse transversely stretched punctation. Female abdominal terminalia not examined.

Type material: TANZANIA: male lectotype (MFNB), **here designated** \perforatus Gerst.* Sansibar Cooke [handwritten] 56743 [printed] Hist.-Coll. (Coleoptera) Nr. 56743 (1. Ex) Xylographus perforatus Gerst. Sansibar, Cooke Zool. Mus. Berlin [printed] [red label] SYNTYPUS Xylographus perforatus Gerstaecker 1871 labelled by MNHUB 1998\ [red label] LECTOTYPE Xylographus perforatus Gerstaecker [handwritten]; 2 males, 3 females paralectotypes (MFNB) \Hist.-Coll. (Coleoptera) Nr. 56743 (1.-5. Ex) Xylographus perforatus Gerst. Sansibar, Cooke Zool. Mus. Berlin [printed] [red label] SYNTYPUS Xylographus perforatus Gerstaecker 1871 labelled by MNHUB 1998\ [yellow label] PARALECTOTYPE Xylographus perforatus Gerstaecker [handwritten]; 1 female paralectotype (MNHN) \Zanzibar, C. Cooke.

[printed]\ MUSEUM PARIS Collection Léon Fairmaire 1906 [printed]\ Xylographus perforatus Gerst. [handwritten] P. Lesne vid. [printed]\ [yellow label] PARALECTOTYPE Xylographus perforatus Gerstaecker [handwritten]\; 1 female paralectotype (MNHN) \Zanzibar, C. Cooke. [printed]\ Bragance (Para) M. de Mathan [printed]\ Kein Scolytide [handwritten]\ [yellow label] PARALECTOTYPE Xylographus perforatus Gerstaecker [handwritten]\; 1 male, 1 female paralectotype (MNHN) \Zanzibar, C. Cooke. [printed]\ Xylographus perforatus Gerst. Zanzib. [handwritten]\ [yellow label] PARALECTOTYPE Xylographus perforatus Gerstaecker [handwritten]\; 1 male, 1 female paralectotypes (MCZ) \Zanzibar, C. Cooke. [printed]\ Xylographus perforatus 140 Gerstaecker [printed]\ [yellow label] PARALECTOTYPE Xylographus perforatus Gerstaecker [handwritten]\;

Additional material: 25 specimens. TANZANIA: 12 males, 10 females (KMMA) \Tanzanie: Mts Uluguru Kinola, for. Transition alt. 1500-1750m polypores, 6-13/VI/71 [printed]\ Coll. Mus. Tervuren Mission Mts Uluguru L. Berger, N. Leleup J. Debecker V/VIII/71 [printed]\ Xylographus perforatus Gerst. LAPC [handwritten]\; 2 females (MFNB) \Trockenwald vef Mtotohovu D. O. A. März1916. leg. Methner [printed]\. KENYA: 1 female (MNHN) \A. F. J. GEDYE RABAI JAN. FEB 1929 [printed]\ Xylographus perforatus [unreadable] [handwritten]\ PIC [handwritten]\.

Host fungi: unknown.

Distribution: Eastern Africa from the coasts of Tanzania, including Zanzibar, and Kenya (Fig. 50).

Xylographus subopacus Pic, 1929

(Figs 25–27)

Xylographus subopacus Pic 1929: 264. Type locality: Democratic Republic of the Congo, Elisabethville.

Diagnosis: Males with median-sized body (3.03–4.42); dorsal vestiture consisting of minute setae, shorter than a puncture-width. Left mandible bearing an upward tooth.

Pronotum and elytra with fine punctation; elytral punctation coarse. Anterior edge of pronotum with its median portion barely or not produced beyond head, seen in lateral view; its anteriormost margin being rounded or angulated at middle forming two rounded lateral lobes; lateral margins distinctly sinuous to straight. Penis subtriangular, about three fourths the length of tegmen; dorsal membranous lobe expanded above the plane of the penis (displace laterally during mounting), without an evident row of sensillae along each side of the ejaculatory duct; slightly sclerotized arch of the ventral lobe about a fourth the length of the penis, forming a subtriangular apex; anterior edge with a couple of narrow struts forming a V-shaped emargination.

Redescription: **male plesiotype** (Figs 25A–C). Measurements: TL 4.07, PL 1.66, PW 2.27, EL 2.41, EW 2.38, GD 2.16. Ratios: PL/PW 0.73, EL/EW 1.01, EL/PL 1.45, GD/EW 0.91, TL/EW 1.71. **Body** elongate, robust, subcylindrical and convex; dorsal and ventral surfaces blackish and shiny; mouthparts, tarsi and antennae reddish-brown; dorsal surface glabrous. **Head** concave, hidden partially by the pronotum; punctation shallow, sparse, with microreticulate shiny sculpture between punctures; dorsal surface mostly glabrous, but with erect yellowish bristles mainly near each eye and over the labrum; frontoclypeal ridge sinuous, the sides slightly projected forward and upward; each lateral margin of vertex just behind the eye elevated into a small subtriangular tubercle. **Mouthparts** with distinct asymmetric mandibles, in which the left mandible bears a conspicuous tooth directed upward (Fig. 25B, arrow); labrum protruding. **Eyes** coarsely faceted with GW of 0.33 mm. Each **antenna** with ten antennomeres (left antenna measured; FL 0.22, CL 0.23, CL/FL 1.05), light colored at base; length of antennomeres one to ten as follows: 0.13, 0.07, 0.07, 0.05, 0.04, 0.03, 0.03, 0.06, 0.07, 0.1; antennal club robust, in which each antennomere has a sinuous row of erect setae that divides it in an upper region bearing four conspicuous sensillifers symmetrically positioned and a lower region with scale-like cuticle; each antennal sensillifer formed by a group of short setae arranged in concentric layers. **Pronotum** with dual punctation, consisting of scarce minute punctures about a third the size of the largest ones and devoid of setae, barely visible even in high magnifications (>80X), and uniformly distributed fine punctures; distance between fine punctures from 1 to 4 puncture-widths; in between punctures microreticulated and shiny; each fine puncture bearing a yellowish decumbent minute seta; anterior edge with its median portion barely produced beyond head, seen in lateral view; its anteriormost margin angulated at middle forming two

rounded lateral lobes; lateral margins distinctly sinuous; anterolateral angles rounded, not produced; lateral margins not visible from above, with some long erect yellowish setae along them. **Scutelum** with BW of 0.19 mm, subtriangular, smooth and shiny. **Elytra** with punctation slightly coarser than that of pronotum; vestiture consisting of minute fine decumbent yellowish setae; surface between punctures smooth and shiny; lateral and posterolateral margins carinated, broadly rounded, with long erect yellowish setae, barely visible from above. **Hind wings** developed (macropterous). **Ventral sclerites** (Fig. 25C) with most of their surfaces finely reticulate and vestiture of decumbent slender setae. **Prosternal disc** concave in front of coxae, finely reticulate, devoid of carina at the longitudinal midline; prosternal process very short, laminate, acute at apex. **Metaventricle** moderately convex, with disc almost glabrous; lateral sides finely reticulated; discrimen indiscernible. **Abdominal ventrites** 1.23 mm long at midline; vestiture of sparse slender setae; shallow and sparse punctures; length of the abdominal ventrites one to five (from base to apex at the longitudinal midline) as follows: 0.47, 0.16, 0.5 0.16, 0.29; first abdominal ventrite with a basal width of 1.57 mm and bearing a margined, circular setose sex patch (Fig. 25C, arrow) located at its middle, the patch with a transverse diameter of 0.07 mm. **Tibiae** expanded and with a row of teeth along their entire outer margin; protibia with an area of long slender yellowish setae concentrated at its inner surface. **Abdominal terminalia** in plesiotype (Figs 26A–F, unless otherwise specified in legend): **Ninth segment** (Fig. 26C) V-shaped with an erect seta at each expanded apex. **Eight tergite** (Fig. 26A) with posterior margin rounded, bearing long bristles; lateral margins diverging; anterior margin concave, slightly sclerotized at sides. **Eight sternite** (Fig. 26B) with posterior margin rounded, bearing few long curved bristles at sides; lateral margins contiguous to the posterior margin, forming a thin projection on each side; anterior margin biconcave, rounded and sclerotized at middle, forming a short median strut. **Aedeagus** (Fig. 26D) about 2.3x as long as wide. **Basal piece** (Fig. 26F) subtriangular, membranous, with rounded angles; posterior margin arched inward forming two lateral lobes. **Tegmen** (Fig. 26D, dotted lines) twice as wide and 1.3x as long as penis, with anterior portion subtriangular; lateral margins subparallel, slightly diverging to apex; posterior portion of its ventral surface with a deep V-shaped emargination of about one-fifth the length of tegmen, forming two lateral lobes, each lobe with a patch of sensillae at the apex. **Penis** (Fig. 26E) subtriangular (excluding the struts on its anterior border), about 3x as long as wide, divided into a long dorsal membranous lobe and a short ventral slightly

sclerotized lobe of about a fourth the length of the penis; membranous lobe expanded above the plane of the penis (displace laterally during mounting), without an evident row of sensillae along each side of the ejaculatory duct; slightly sclerotized arch of the ventral lobe forming a subtriangular apex; lateral margins converging to apex; anterior edge with a couple of narrow struts forming a V-shaped emargination.

Variation: males, measurements (n = 46, including the plesiotype): TL 3.03–4.42 (3.80 ± 0.30); PL 1.24–1.88 (1.58 ± 0.15); PW 1.67–2.33 (2.07 ± 0.16); EL 1.66–2.66 (2.23 ± 0.20); EW 1.77–2.46 (2.22 ± 0.16); GD 1.56–2.37 (2.01 ± 0.18). Ratios: PL/PW 0.67–0.86 (0.76 ± 0.04); EL/EW 0.90–1.11 (1.00 ± 0.05); EL/PL 1.19–1.69 (1.42 ± 0.13); GD/EW 0.80–1.01 (0.91 ± 0.04); TL/EW 1.57–1.85 (1.72 ± 0.05). Head more concave in large and median-sized males than small-sized males; lateral tubercles above the eyes less elevated in small males; the length of the elevated tooth of the left mandible varies in proportion to the length of the specimen, with small males with shorter tooth; anterior edge of pronotum with its median portion barely or not produced beyond head, seen in lateral view; its anteriormost margin angulated at middle forming two rounded lateral lobes in large-sized males and rounded and slightly produced in median-sized (Figs 27A–C) and small-sized males (Fig. 27D–F), making the smallest males morphologically similar to females; lateral margins distinctly sinuous to straight. Females (Figs 25D–F), measurements in mm (n = 47, including the lectotype): TL 3.16–4.09 (3.60 ± 0.23); PL 1.24–1.88 (1.50 ± 0.14); PW 1.76–2.16 (1.94 ± 0.12); EL 1.84–2.41 (2.10 ± 0.16); EW 1.82–2.31 (2.10 ± 0.13); GD 1.64–2.25 (1.94 ± 0.15). Ratios: PL/PW 0.65–0.93 (0.77 ± 0.06); EL/EW 0.84–1.13 (1.00 ± 0.06); EL/PL 1.05–1.76 (1.41 ± 0.15); GD/EW 0.80–1.09 (0.92 ± 0.05); TL/EW 1.49–2.03 (1.72 ± 0.07). Similar to males except in the following features: abdominal sex patch absent; head flat, punctation comparatively coarser; left mandible devoid of projected tooth; anterior edge of pronotum rounded, not produced; anterior portion of pronotum with coarse and deep transversely stretched punctation. Female abdominal terminalia not examined.

Type material: DEMOCRATIC REPUBLIC OF THE CONGO: female lectotype (BMNH), **here designated** LECTOTYPE [printed] BELGIAN CONGO. 18 m. S. W. of Elizabethville. 24.iii.1928. Dr. H. S. Evans. [printed] Pres. by Imp. Inst. Ent. Brit. Mus. 1932-147. [printed] [red labeled] LECTOTYPE *Xylographus subopacus* Pic

[handwritten]; 1 female paralectotype (MNHN) \BELGIAN CONGO. 18 m. S. W. of Elizabethville. 1928. Dr. H. S. Evans. [printed]\ *Xylographus subopacus* n. sp. [handwritten]\ [yellow label] PARALECTOTYPE *Xylographus subopacus* Pic [handwritten]\.

Additional material: 326 specimens. DEMOCRATIC REPUBLIC OF THE CONGO: male plesiotype (KMMA) \COLL. MUS. CONGO Equateur: Eala I-1940 I.N.E.A.C. [printed]\ Sur fruits *Allanblackia floribunda* [printed]\ [orange label] PLESIOTYPE *Xylographus subopacus* Pic [handwritten]; 30 males, 14 females (KMMA) \COLL. MUS. CONGO Equateur: Eala I-1940 I.N.E.A.C. [printed]\ Sur fruits *Allanblackia floribunda* [printed]; 1 female (KMMA) \MUSÉE DU CONGO Eala II-1935 J. Ghesquière [printed]; 1 female (KMMA) \MUSÉE DU CONGO Eala III-1935 J. Ghesquière [printed]; 3 males, 1 female (KMMA) \MUSÉE DU CONGO Eala IV-1935 J. Ghesquière 408 [printed]\ Eclos de champignons [handwritten]\ *Xylographus* sp. [handwritten]; 8 males, 32 females (KMMA) \MUSÉE DU CONGO Eala VI-1935 J. Ghesquière 613 [printed]\ sur champignons globuleux bruns [handwritten]\ une partie en alcool [handwritten]\ *Xylographus* sp. (Cioidae) [handwritten]; 1 male, 5 females (KMMA) \MUSÉE DU CONGO Eala VII-1935 J. Ghesquière [printed]; 3 males, 1 female (KMMA) \MUSÉE DU CONGO Eala IX-1936 J. Ghesquière [printed]; 14 males, 9 females (KMMA) \MUS. CONGO Eala VII-1938 J. Ghesquière 7128 [printed]\ Congo belge INEAC Eala VII-1938 J. Ghesquière [printed]; 39 males, 20 females (KMMA) \COLL. MUS. CONGO Eala 4-XII-1939 G. Couteaux [printed]\ sur Albrizzia [handwritten]; 29 males, 31 females (KMMA) \MUSÉE DU CONGO Congo da Lemba V-1911 R. Mayné [printed]\ Récolté sur *Elaeis guineensis* [printed]\ R. DÉT. 628 [printed]\ *Xylographus* sp. DET. G.A.K.M. [handwritten]\ *Xylographus tarsalis* Fhrs. C. Lopes-Andrade det. 2008 [handwritten]; 1 female (KMMA) \COLL. MUS. CONGO Kafakumba XI-1933 G. F. Overlaet [printed]; 10 males, 13 females (KMMA) \MUSÉE DU CONGO Leverville 1918 R. Mayné [printed]\ *Xylographes tarsalis* Fhrs. C. Lopes-Andrade det. 2008 [handwritten]; 25 males, 26 females (KMMA) \MUSÉE DU CONGO Lulua: Sandoa VIII-1930 F. G. Overlaet [printed]; 1 female (KMMA) \Coll. Mus. Tervuren Tshuapa: Etata VIII 1969 J. Hauwaerts [printed]\. CONGO: 1 female (KMMA) \MUSÉE DU CONGO Tshela 16-XI-1920 Dr H. Schouteden [printed]\. IVORY COAST: 1 male, 1 female (KMMA) \COLL. MUS. TERVUREN Côte d'ivoire: Bingerville IX.1962 J. Decelle [printed]; 1 male (KMMA) \COLL. MUS

TERVUREN Côte d'ivoire: Bingerville X.1962 J. Decelle [printed]\ Dans Polypore [printed]. TOGO: 1 male (MHNG) \TOGO PALIME Forêt de Klouto 20-24-IV-74 S. Vit [printed]. UGANDA: 1 male, 1 female (LAPC) \Uganda K'la KIKAYA 20.4.91 Champignon [printed]\ *Xylographus* [handwritten]\ *Xylographus tarsalis* Fahraeus LAPC [handwritten].

Host fungi: some specimens were reported as being collected on *Albizia* sp. (Fabales: Fabaceae); a big series of specimens from Democratic Republic of the Congo, Eala were collected on fruits of the tree *Allanblackia floribunda* Oliv. (Malpighiales: Clusiaceae); specimens from Democratic Republic of the Congo, Congo da Lemba were collected on the African oil palm *Elaeis guineensis* Jacq. 1897 (Arecales: Arecaceae).

Distribution: Continental tropical Africa from Ivory Coast, Togo, Congo, Democratic Republic of the Congo and Uganda (Fig. 51).

***Xylographus subsinuatus* Pic, 1916**

(Figs 28–31)

Xylographus subsinuatus Pic 1916: 4. Type locality: Madagascar.

Xylographus rufescens Pic 1921: 7. **New junior synonym** (Figs 31A–C). Type locality: Bourbon Island.

Diagnosis: Males with median-size body (3.46–5.38); dorsal vestiture consisting of short erect setae (better seen in lateral view), longer than a puncture-width. Left mandible bearing an upward tooth. Pronotum and elytra with fine punctation; elytral punctation coarse and dense. Anterior edge of pronotum with its median portion projected forward, its anteriormost margin being rounded, straight or angulated at middle forming two rounded lateral lobes; lateral margins distinctly arched inward. Penis subtriangular, about three fourths the length of tegmen; dorsal membranous lobe forming an acute apex; sclerotized arch of the ventral lobe about a third the length of the penis, forming an acute apex; anterior edge with a couple of short struts forming a V-shaped emargination.

Redescription: **male lectotype** (Figs 28A–C). Measurements: TL 4.79, PL 2.08, PW 2.54, EL 2.71, EW 2.60, GD 2.38. Ratios: PL/PW 0.82, EL/EW 1.04, EL/PL 1.30, GD/EW 0.92, TL/EW 1.84. **Body** elongate, robust, subcylindrical and convex; dorsal and some ventral surfaces blackish and shiny; mouthparts, tarsi, abdominal ventrites and antennae reddish-brown; dorsal vestiture consisting of short erect setae, longer than a puncture-width, more evident in the elytra. **Head** convex, hidden partially by the pronotum; regular punctated with a yellowish decumbent minute seta inside each shallow puncture and microreticulate sculpture between them; dorsal surface mostly glabrous, but with erect yellowish bristles over the labrum; frontoclypeal ridge sinuous, the sides slightly projected forward and upward; each lateral margin of vertex just behind the eye elevated into a subtriangular tubercle. **Mouthparts** with distinct asymmetric mandibles, in which the left mandible bears a conspicuous tooth directed upward (Fig. 28B, arrow); labrum protruding. **Eyes** coarsely faceted with GW of 0.34 mm. Each **antenna** with ten antennomeres (right antenna measured; FL 0.33, CL 0.35, CL/FL 1.06); length of antennomeres one to ten as follows: 0.2, 0.09, 0.13, 0.07, 0.05, 0.04, 0.04, 0.1, 0.11, 0.14; antennal club robust, in which each antennomere has a sinuous row of erect setae that divides it in an upper region bearing four conspicuous sensillifers symmetrically positioned and a lower region with scale-like cuticle; each antennal sensillifer formed by a group of short setae arranged in concentric layers. **Pronotum** with dual punctation, consisting of scarce minute punctures about a third the size of the largest ones and devoid of setae, barely visible even in high magnifications (>80X), and uniformly distributed fine punctures; distance between fine punctures from 2 to 3.5 puncture-widths; in between punctures microreticulated and very shiny; each fine puncture bearing a short erect setae (better seen in lateral view), longer than a puncture-width; anterior edge with its median portion forming a projection, its anteriormost margin straight and its lateral margins distinctly arched inward; anterolateral angles rounded, not produced; lateral margins not visible from above, with a few long erect yellowish setae along them. **Scutelum** with BW of 0.16 mm, subtriangular, smooth and shiny. **Elytra** punctation coarser and slightly denser than that of pronotum; vestiture consisting of short erect setae, longer than a puncture-width; surface between punctures smooth and shiny; lateral and posterolateral margins carinated, broadly rounded, with long erect yellowish setae, not visible in dorsal view. **Hind wings** developed (macropterous). **Ventral sclerites** (Fig. 28C) with most of their surfaces finely reticulate and vestiture of decumbent slender setae. **Prosternal disc**

concave in front of coxae, finely reticulate, devoid of carina at the longitudinal midline; prosternal process very short, laminate, acute at apex. **Metaventricle** moderately convex, with disc bearing sparse long erect setae; lateral sides with irregular, sparse punctation; discrimen indiscernible. **Abdominal ventrites** 1.35 mm long in midline; vestiture of sparse erect setae; coarse punctures; length of the abdominal ventrites one to five (from base to apex at the longitudinal midline) as follows: 0.58, 0.17, 0.15, 0.17, 0.28; first abdominal ventrite with a basal width of 1.8 mm and bearing a margined, circular setose sex patch (Fig. 28C, arrow) located at its middle, the patch with a transverse diameter of 0.07 mm. **Tibiae** expanded and with a row of teeth along their entire outer margin; protibia with an area of long slender yellowish setae concentrated at its inner surface. **Abdominal terminalia** in a paralectotype (Figs 29A–F, unless otherwise specified in the legend): **Ninth segment** (Fig. 29D) V-shaped with an erect seta at each apex. **Eight tergite** (Fig. 29A) with posterior margin rounded, bearing long bristles; lateral margins diverging; anterior margin concave, slightly sclerotized at sides. **Eight sternite** (Fig. 29B) with posterior margin rounded, bearing few long curved bristles at sides; lateral margins contiguous to the posterior margin, forming a thin projection on each side; anterior margin biconcave, rounded and sclerotized at middle, forming a short median strut. **Aedeagus** (Fig. 29C) about 2.2x as long as wide. **Basal piece** (Fig. 29F) subtriangular, membranous, with rounded angles; posterior margin arched inward forming two lateral lobes. **Tegmen** (Fig. 29C, dotted lines) 1.5x as wide and 1.5x as long as penis, with anterior portion subtriangular and acute; lateral margins subparallel, slightly diverging to apex; posterior portion of its ventral surface with a V-shaped emargination of about one-fourth the length of tegmen, forming two lateral lobes, each lobe with a patch of sensillae at the apex. **Penis** (Fig. 29E) subtriangular (excluding the struts on its anterior border), about 2.3x as long as wide, divided into a dorsal membranous lobe and a ventral sclerotized lobe of about a third the length of the penis; membranous lobe forming a sharpen angle on its apex with a row of sensillae along each side of the ejaculatory duct; sclerotized arch of the ventral lobe forming an acute apex; sublateral margins converging to apex; anterior edge with a couple of short struts forming a V-shaped emargination.

Variation: males, measurements (n = 35, including the lectotype): TL 3.46–5.38 (4.49 ± 0.49); PL 1.39–2.55 (1.94 ± 0.27); PW 1.81–2.74 (2.35 ± 0.26); EL 2.07–3.10 (2.50 ± 0.26); EW 1.95–2.96 (2.44 ± 0.24); GD 1.75–2.51 (2.15 ± 0.20). Ratios: PL/PW

0.75–0.98 (0.82 ± 0.04); EL/EW 0.94–1.07 (1.02 ± 0.03); EL/PL 1.06–1.52 (1.30 ± 0.10); GD/EW 0.81–0.94 (0.88 ± 0.04); TL/EW 1.71–2.06 (1.82 ± 0.06). Head more concave in large and median-sized males, and flat in small males; lateral tubercles above the eyes less elevated to absent in small males; the length of the elevated tooth of the left mandible varies in proportion to the length of the specimen, with some small males with an insignificant tooth; anterior edge of pronotum with its median portion strongly projected forward, slightly turned upward, its anteriormost margin angulated at middle forming two rounded lateral lobes or straight in large-sized males (Fig 28A–C) and median-sized males (Figs 30A–C); slightly sinuated or rounded and slightly produced in small-sized males (Fig. 30D–F), making the smallest males morphologically similar to females. Females (Figs 28D–F), measurements (n = 18): TL 3.49–4.97 (4.17 ± 0.43); PL 1.53–2.16 (1.83 ± 0.19); PW 1.84–2.40 (2.12 ± 0.18); EL 1.95–2.81 (2.25 ± 0.25); EW 2.00–2.53 (2.25 ± 0.19); GD 1.78–2.41 (2.03 ± 0.20). Ratios: PL/PW 0.77–1.09 (0.86 ± 0.08); EL/EW 0.94–1.38 (1.00 ± 0.12); EL/PL 1.11–1.35 (1.23 ± 0.08); GD/EW 0.80–1.18 (0.91 ± 0.09); TL/EW 1.71–2.44 (1.82 ± 0.19). Similar to males except in the following features: abdominal sex patch absent; head flat, punctation comparatively denser; left mandible devoid of projected tooth; anterior edge of pronotum rounded, marginated; anterior portion of pronotum with coarse and deep transversely stretched punctation. Female abdominal terminalia not examined.

Type material: MADAGASCAR: male lectotype (MNHN), **here designated** \MADAGASCAR Plantations du Sambirano COLLECTION LE MOULT [printed] Coll. C [handwritten] Type [handwritten] subsinuatus Pic [handwritten] [red label] LECTOTYPE Xylographus subsinuatus Pic [handwritten]; 6 males, 3 females, 17 specimens paralectotypes (MNHN) \MADAGASCAR Plantations du Sambirano COLLECTION LE MOULT [printed] Coll. C [handwritten] [yellow label] PARALECTOTYPE Xylographus subsinuatus Pic [handwritten].

Material examined: 49 specimens. MADAGASCAR: 5 males, 5 females (MNHN) \MUSEUM PARIS MADAGASCAR PERRIER DE LA BATHIE COLL. LÉON FAIRMAIRE 1906; 1 male [FMNH] Fanna Ins. Nossibé. [printed]; 1 male (MNHN) \Madagascar [handwritten]; 1 male (MNHN) \[unreadable] Réunion [handwritten]; 5 males, 1 female (MNHN) \MUSEUM PARIS MADAGASCAR Collection Léon Fairmaire 1906 [printed] Xylographus antracinus Mellié Madag. [handwritten]; 2

males, 1 female (MNHN)\ Madag [handwritten]\ *Xylographus anthracinus* Madag [handwritten]; 11 males, 6 females (MFNB)\ N.W. Madagascar J. Nossibé 7-X.95 Voeltzkow S. [printed] = N° 48446 [handwritten]\ 12 [handwritten]. REUNION: male lectotype (MNHN) of *Xylographus rufescens* Pic 1921, **here designated** \Ile Bourbon n. sp. [handwritten]\ type [handwritten]\ *rufescens* Pic [handwritten]\ [red label] LECTOTYPE *Xylographus rufescens* Pic [handwritten].

Host fungi: unknown.

Distribution: Madagascar and Reunion (Fig. 50).

New species

***Xylographus* sp. nov. 01 Sandoval-Gómez & Lopes-Andrade, 2013**

(Figs 32–34)

Xylographus sp. nov. 01 Sandoval-Gómez & Lopes-Andrade 2013. Type locality: Madagascar.

Diagnosis: Males with large-sized body (4.38–6.06); dorsal vestiture consisting of minute setae, shorter than a puncture-width. Left mandible bearing an upward tooth. Pronotum and elytra with fine punctation; elytral punctation coarse. Anterior edge of pronotum with its median portion projected forward, its anteriormost margin being straight or angulated at middle forming two angulated lateral lobes; lateral margins distinctly arched inward. Penis subtriangular, less than half the length of tegmen; long dorsal membranous lobe forming an acute apex; sclerotized arch of the ventral lobe about a half the length of the penis, shorter than the dorsal lobe; anterior edge with a couple of struts forming a V-shaped emargination.

Description: **male holotype** (Figs 32A–C). Measurements: TL 5.52, PL 2.34, PW 2.87, EL 3.18, EW 2.95, GD 2.72. Ratios: PL/PW 0.82, EL/EW 1.08, EL/PL 1.36, GD/EW 0.92, TL/EW 1.87. **Body** elongate, robust, subcylindrical and convex; dorsal and ventral surfaces blackish and shiny; mouthparts, tarsi and antennae reddish-brown;

dorsal surface glabrous. **Head** concave, hidden partially by the pronotum; punctation shallow, sparse, with microreticulate sculpture between punctures; dorsal surface mostly glabrous, but with erect yellowish bristles mainly near each eye and over the labrum; frontoclypeal ridge sinuous, the sides slightly projected forward and upward; each lateral margin of vertex just behind the eye elevated into a width subtriangular tubercle. **Mouthparts** with distinct asymmetric mandibles, in which the left mandible bears a conspicuous tooth directed upward (Fig. 32B, arrow); labrum protruding. **Eyes** coarsely faceted with GW of 0.36 mm. Each **antenna** with ten antennomeres (right antenna measured; FL 0.29, CL 0.32, CL/FL 1.1), light colored at base; length of antennomeres one to ten as follows: 0.16, 0.09, 0.1, 0.06, 0.05, 0.04, 0.04, 0.09, 0.1, 0.13; antennal club robust, in which each antennomere has a sinuous row of erect setae that divides it in an upper region bearing four conspicuous sensillifers symmetrically positioned and a lower region with scale-like cuticle; each antennal sensillifer formed by a group of short setae arranged in concentric layers. **Pronotum** with dual punctation, consisting of scarce minute punctures about a third the size of the largest ones and devoid of setae, barely visible even in high magnifications (>80X), and uniformly distributed fine punctures; distance between fine punctures from 3 to 5 puncture-widths; in between punctures microreticulated and shiny; each fine puncture bearing a yellowish decumbent minute seta; anterior edge with its median portion forming a projection, its anteriormost margin angulated at middle forming two angulated lateral lobes and its lateral margins distinctly arched inward; anterolateral angles rounded, not produced; lateral margins not visible from above, with a few long erect yellowish setae along them. **Scutelum** with BW of 0.23 mm, subtriangular, smooth and shiny. **Elytra** with similar punctation but slightly coarser than that of pronotum; vestiture consisting of minute fine decumbent yellowish setae; surface between punctures smooth and shiny; lateral and posterolateral margins carinated, broadly rounded, with long erect yellowish setae, not visible in dorsal view. **Hind wings** developed (macropterous). **Ventral sclerites** (Fig. 32C) with most of their surfaces finely reticulate and vestiture of abundant decumbent slender setae. **Prosternal disc** concave in front of coxae, finely reticulate, devoid of carina at the longitudinal midline; prosternal process very short, laminate, acute at apex. **Metaventricle** moderately convex; elevated disc with few long erect yellowish setae; lateral sides finely reticulate; discrimen indiscernible. **Abdominal ventrites** 1.67 mm long at midline; vestiture of sparse slender setae; shallow and sparse punctures; length of the abdominal ventrites one to five (from base to apex at the longitudinal midline) as

follows: 0.67, 0.23, 0.23, 0.23, 0.31; first abdominal ventrite with a basal width of 1.94 mm and bearing a margined, circular setose sex patch (Fig. 32C, arrow) located at its middle, the patch with a transverse diameter of 0.08 mm. **Tibiae** expanded and with a row of teeth along their entire outer margin; protibia with an area of long slender yellowish setae concentrated at its inner surface. **Abdominal terminalia** in paratype (Figs 33A–F, unless otherwise specified in the legend): **Ninth segment** (Fig. 33D) V-shaped with an erect seta at each expanded apex. **Eight tergite** (Fig. 33A) with posterior margin rounded, bearing long bristles; lateral margins diverging; anterior margin concave, slightly sclerotized at sides. **Eight sternite** (Fig. 33B) with posterior margin rounded, bearing few long curved bristles at sides; lateral margins contiguous to the posterior margin, forming a thin projection on each side; anterior margin biconcave, rounded and sclerotized at middle, forming a short median strut. **Aedeagus** (Fig. 33C) about 2.3x as long as wide. **Basal piece** (Fig. 33F) subtriangular, membranous, with rounded angles. **Tegmen** (Fig. 33C, dotted lines) twice as wide and 2.7x as long as penis, with anterior portion subtriangular; lateral margins subparallel, slightly diverging to apex; posterior portion of its ventral surface with a V-shaped emargination of about one-fifth the length of tegmen, forming two lateral lobes, each lobe with a patch of sensillae at the apex. **Penis** (Fig. 33E) subtriangular, about 1.5x as long as wide, divided into a long dorsal membranous lobe and a short ventral sclerotized lobe of about a half the length of the penis; membranous lobe forming a sharpen angle on its apex with a row of sensillae along each side of the ejaculatory duct; sclerotized arch of the ventral lobe about a half the length of the penis, shorter than the dorsal lobe; lateral margins converging to apex; anterior edge with a couple of short struts forming a V-shaped emargination.

Variation: males, measurements (n = 12, including the holotype): TL 4.38–6.06 (5.30 ± 0.44); PL 1.80–2.63 (2.23 ± 0.23); PW 2.18–3.05 (2.71 ± 0.25); EL 2.58–3.43 (3.07 ± 0.23); EW 2.33–3.13 (2.85 ± 0.23); GD 2.25–3.02 (2.59 ± 0.21). Ratios: PL/PW 0.78–0.86 (0.82 ± 0.02); EL/EW 1.03–1.14 (1.08 ± 0.04); EL/PL 1.28–1.49 (1.38 ± 0.08); GD/EW 0.84–0.97 (0.91 ± 0.04); TL/EW 1.79–1.94 (1.86 ± 0.04). Head more concave and with comparatively finer punctation in large and median-sized males, and flat with sparse punctures in small males; lateral tubercles above the eyes less elevated to absent in small males; the length of the elevated tooth of the left mandible varies in proportion to the length of the specimen, so that large males usually have longer tooth than small

males; anterior edge of pronotum with its median portion strongly projected forward, slightly turned upward, its anteriormost margin angulated at middle forming two angulated lateral lobes in large-sized males and slightly sinuated (Figs 34A–C) to straight (Fig. 34D–F) in median-sized and small-sized males. Females (Figs 32D–F), measurements (n = 13): TL 4.33–5.46 (5.02 ± 0.33); PL 1.89–2.29 (2.10 ± 0.12); PW 2.28–3.00 (2.60 ± 0.19); EL 2.33–3.25 (2.91 ± 0.26); EW 2.38–3.05 (2.71 ± 0.19); GD 2.25–2.72 (2.51 ± 0.15). Ratios: PL/PW 0.67–0.88 (0.81 ± 0.06); EL/EW 0.94–1.12 (1.07 ± 0.05); EL/PL 1.16–1.59 (1.39 ± 0.12); GD/EW 0.89–0.97 (0.93 ± 0.02); TL/EW 1.75–1.92 (1.85 ± 0.05). Similar to males except in the following features: abdominal sex patch absent; head flat, punctation comparatively coarser; left mandible devoid of projected tooth; anterior edge of pronotum rounded, not produced; anterior portion of pronotum with coarse transversely stretched punctation. Female abdominal terminalia not examined.

Type material: MADAGASCAR: male holotype (MFNB) \Madagaskar [printed] \Xylographus anthracinus [handwritten] \Fairmaire determ. [handwritten] \Coll. L. W. Schaufuss [printed] \ [red label] HOLOTYPE Xylographus sp. nov. 01 Sandoval-Gómez & Lopes-Andrade [handwritten]; 5 males, 3 females paratypes (MFNB) \Madagaskar [printed] \Coll. L. W. Schaufuss [printed] \ [yellow label] PARATYPE Xylographus sp. nov. 01 Sandoval-Gómez & Lopes-Andrade [handwritten].

Additional material: 17 specimens. MADAGASCAR: 4 males, 4 females (MNHN) \MUSEUM PARIS MADAGASCAR SIKORA 821-93 [printed] \ [circular label] Madagascar Sikora [printed] \ vit dans des champignons [handwritten]; 3 males, 4 females (FMNH) \Tananarivo MADAGASCAR Staudinger & Hass Coll'n 35 [printed]; 2 females (FMNH) \Tananarive Madag. [printed] \ CNHM 1960—Purchase from E. Hennecke (Staudinger & B. Haas residual Coleop. Colln.) [printed] \ 35 [printed] \ Xylographus anthracinus Mellié [printed].

Host fungi: unknown.

Distribution: Madagascar (Fig. 52).

Xylographus sp. nov. 02 Sandoval-Gómez & Lopes-Andrade, 2013

(Figs 35–37)

Xylographus sp. nov. 02 Sandoval-Gómez & Lopes-Andrade 2013. Type locality: Democratic Republic of the Congo, Eala.

Diagnosis: Males with small-sized body (2.76–4.05); dorsal vestiture consisting of minute setae, shorter than a puncture-width. Left mandible bearing an upward tooth. Pronotum with fine punctation; elytra with distinctly coarse punctation. Anterior edge of pronotum with its median portion projected forward, its anteriormost margin being rounded, straight or slightly sinuated forming two small rounded lateral lobes; lateral margins distinctly arched inward. Penis subtriangular, about two thirds the length of tegmen; dorsal membranous lobe forming an acute apex; sclerotized arch of the ventral lobe (Fig. 36E, arrow) more than half the length of the penis, forming an acute apex; anterior edge with a couple of struts forming a V-shaped emargination.

Description: **male holotype** (Figs 35A–C). Measurements: TL 3.80, PL 1.65, PW 2.02, EL 2.15, EW 2.15, GD 2.03. Ratios: PL/PW 0.82, EL/EW 1.00, EL/PL 1.30, GD/EW 0.94, TL/EW 1.77. **Body** elongate, robust, subcylindrical and convex; dorsal and ventral surfaces, legs and tarsi blackish and shiny; mouthparts and antennae reddish-brown; dorsal surface glabrous. **Head** concave, hidden partially by the pronotum; punctation shallow, sparse, with microreticulate sculpture between punctures; dorsal surface mostly glabrous, but with erect yellowish bristles mainly near each eye and over the labrum; frontoclypeal ridge sinuous, the sides slightly projected forward and upward; each lateral margin of vertex just behind the eye elevated into a subtriangular tubercle. **Mouthparts** with distinct asymmetric mandibles, in which the left mandible bears a conspicuous tooth directed upward (Fig. 35B, arrow); labrum protruding. **Eyes** coarsely faceted with GW of 0.25 mm. Each **antenna** with ten antennomeres (right antenna measured; FL 0.15, CL 0.23, CL/FL 1.53); length of antennomeres one to ten as follows: 0.13, 0.04, 0.04, 0.03, 0.03, 0.03, 0.02, 0.06, 0.07, 0.1; antennal club robust, in which a row of erect setae about each or the four conspicuous sensillifers symmetrically positioned; each antennal sensillifer formed by a group of short setae arranged in concentric layers. **Pronotum** with dual punctation, consisting of scarce minute punctures about a third the size of the largest ones and

devoid of setae, barely visible even in high magnifications (>80X), and uniformly distributed fine punctures; distance between fine punctures from 1.5 to 3.5 puncture-widths; in between punctures microreticulated and shiny; each fine puncture bearing a yellowish decumbent minute seta; anterior edge with its median portion forming a projection, its anteriormost margin slightly sinuated forming two small rounded lateral lobes and its lateral margins distinctly arched inward; anterolateral angles rounded, not produced; lateral margins not visible from above, with a few long erect yellowish setae along them. **Scutelum** with BW of 0.15 mm, subtriangular, smooth and shiny. **Elytra** with distinctly coarse and deep punctation, slightly denser than that of pronotum; vestiture consisting of minute fine decumbent yellowish setae; surface between punctures smooth and shiny; lateral and posterolateral margins carinated, broadly rounded, with long erect yellowish setae, barely visible from above. **Hind wings** developed (macropterous). **Ventral sclerites** (Fig. 35C) with most of their surfaces finely reticulate and vestiture of few decumbent slender setae. **Prosternal disc** concave in front of coxae, finely reticulate, devoid of carina at the longitudinal midline; prosternal process very short, laminate, acute at apex. **Metaventricle** moderately convex, with disc almost glabrous; lateral sides with sparse punctation; discrimen indiscernible. **Abdominal ventrites** 1.15 mm long at midline; vestiture of sparse slender setae; shallow and sparse punctures; length of the abdominal ventrites one to five (from base to apex at the longitudinal midline) as follows: 0.43, 0.16, 0.15, 0.15, 0.26; first abdominal ventrite with a basal width of 1.36 mm and bearing a margined, circular setose sex patch (Fig. 35C, arrow) located at its middle, the patch with a transverse diameter of 0.05 mm. **Tibiae** expanded and with a row of teeth along their entire outer margin; protibia with an area of long slender yellowish setae concentrated at its inner surface. **Abdominal terminalia** in paratype (Figs 36A–F, unless otherwise specified in the legend): **Ninth segment** (Fig. 36C) V-shaped with an erect seta at each apex. **Eight tergite** (Fig. 36A) with posterior margin rounded, bearing long bristles; lateral margins diverging; anterior margin concave, slightly sclerotized at sides. **Eight sternite** (Fig. 36B) with posterior margin rounded, bearing few long curved bristles at sides; lateral margins contiguous to the posterior margin, forming a thin projection on each side; anterior margin biconcave, rounded and sclerotized at middle, forming a short median strut. **Aedeagus** (Fig. 36D) about 2.2x as long as wide. Basal piece (Fig. 36F) subtriangular, membranous, with rounded angles; posterior margin arched inward forming two lateral lobes. **Tegmen** (Fig. 36D, dotted lines) 1.5x as wide and 1.7x as

long as penis, with anterior portion subtriangular; lateral margins subparallel, slightly diverging to apex; posterior portion of its ventral surface with a deep V-shaped emargination of about one-fifth the length of tegmen, forming two lateral lobes, each lobe with a patch of sensillae at the apex. **Penis** (Fig. 36E) subtriangular (excluding the struts on its anterior border), about 2.5x as long as wide, divided into a long dorsal membranous lobe and a ventral sclerotized lobe of about more than half the length of the penis; membranous lobe forming a sharpen angle on its apex with a row of sensillae along each side of the ejaculatory duct; sclerotized arch of the ventral lobe (Fig. 36E, arrow) forming an acute apex; lateral margins converging to apex; anterior edge with a couple of struts forming a V-shaped emargination.

Variation: males, measurements (n = 11, including the holotype): TL 2.76–4.05 (3.62 ± 0.34); PL 1.13–1.69 (1.49 ± 0.16); PW 1.46–2.08 (1.88 ± 0.17); EL 1.63–2.39 (2.13 ± 0.20); EW 1.54–2.21 (2.00 ± 0.18); GD 1.46–2.11 (1.84 ± 0.17). Ratios: PL/PW 0.75–0.82 (0.79 ± 0.02); EL/EW 1.00–1.12 (1.07 ± 0.04); EL/PL 1.30–1.61 (1.44 ± 0.10); GD/EW 0.86–0.97 (0.92 ± 0.04); TL/EW 1.74–1.92 (1.81 ± 0.05). Head more concave in large and median-sized males, and flat in small males; lateral tubercles above the eyes less elevated to absent in small males; the length of the elevated tooth of the left mandible varies in proportion to the length of the specimen, so that large males usually have longer tooth than small males; anterior edge of pronotum with its median portion strongly projected forward, slightly turned upward, its anteriormost margin slightly sinuated forming two small rounded lateral lobes in large-sized males; straight in median-sized males (Figs 37A–C) and rounded in small-sized males (Fig. 37D–F), making the smallest males morphologically similar to females. Females (Figs 35D–F), measurements in mm (n = 2): TL 3.37–3.60 (3.49 ± 0.16); PL 1.45–1.51 (1.48 ± 0.04); PW 1.78–1.85 (1.82 ± 0.05); EL 1.86–2.15 (2.01 ± 0.21); EW 1.90–1.98 (1.94 ± 0.06); GD 1.84–1.90 (1.87 ± 0.04). Ratios: PL/PW 0.78–0.85 (0.82 ± 0.05); EL/EW 0.98–1.09 (1.03 ± 0.08); EL/PL 1.23–1.48 (1.36 ± 0.18); GD/EW 0.96–0.97 (0.96 ± 0.01); TL/EW 1.77–1.82 (1.80 ± 0.03). Similar to males except in the following features: abdominal sex patch absent; head flat, punctation comparatively coarser; left mandible devoid of projected tooth; anterior edge of pronotum rounded, not produced; anterior portion of pronotum with deep transversely stretched punctation. Female abdominal terminalia not examined.

Type material: DEMOCRATIC REPUBLIC OF THE CONGO: male holotype (KMMA) \MUSÉE DU CONGO Eala 1921 L¹ Ghesquière [printed]\ *Xylographus seychellensis* Scott LAPC [handwritten] \ [red label] HOLOTYPE *Xylographus* sp. nov. 02 Sandoval-Gómez & Lopes-Andrade [handwritten]; 5 males, 2 females paratypes (KMMA) \MUSÉE DU CONGO Eala 1921 L¹ Ghesquière Ganoderma [printed] \ [yellow label] PARATYPE *Xylographus* sp. nov. 02 Sandoval-Gómez & Lopes-Andrade [handwritten].

Additional material: 5 specimens. DEMOCRATIC REPUBLIC OF THE CONGO: 1 male (KMMA) \Stanleyville VII-1954 [handwritten]\ Collection J. G. Pantos [printed] \ 858 [handwritten] \ COLL. MUS. CONGO 858 ex coll. J. Pantos [printed]; 1 male (KMMA) \YANGAMBI, 1952 C. DONIS Z. A434 [printed] \ COLL. R. MAYNÉ COM. ÉT. BOIS CONGO R. 2453 [printed] \ COLL. MUS. TERVUREN don R. Mayné [printed]. EQUATORIAL GUINEA: 1 male (MNHN) \Benito Congo Franc. [printed] \ MUSEUM PARIS Coll. A. GROUVELLE 1917 [printed] \ *Xylographus* sp. distinct from *X. seychellensis*, Scott [handwritten]. GHANA: 2 males (SANC) \GHANA: Ankasa National Park, NW Axim 05°20'N 02°34'W viii.2005 S. Nesor [printed] \ Ex large bracket fungi on dead logs (APHYLLOPHORALES) [printed] \ NATIONAL COLL. OF INSECTS Pretoria, South Africa [printed].

Host fungi: some specimens were reported as being collected on *Ganoderma* sp. (Polyporales: Ganodermataceae).

Distribution: Western Africa to western Central Africa from Ghana, Equatorial Guinea and Democratic Republic of the Congo (Fig. 53).

***Xylographus* sp. nov. 03 Sandoval-Gómez & Lopes-Andrade, 2013**

(Figs 38–40)

Xylographus sp. nov. 03 Sandoval-Gómez & Lopes-Andrade 2013. Type locality: Kamerun, Mokundange.

Diagnosis: Males with small-sized body (TL 2.66–2.90); dorsal vestiture consisting of minute setae, shorter than a puncture-width. Left mandible bearing an upward tooth. Pronotum and elytra with coarse punctation; elytral punctation dense and deep. Anterior edge of pronotum with its median portion projected forward, its anteriormost margin being rounded; lateral margins distinctly straight. Elytra bearing two conspicuous calli at the posterior portion, one in each side close of the elytral suture. Penis subtriangular, about three fourths the length of tegmen; dorsal membranous lobe forming a subtriangular apex; ventral membranous lobe about a third the length of the penis, forming a subtriangular apex; anterior edge with a couple of long and narrow struts forming a V-shaped emargination. Females with abdominal sex patch.

Description: **male holotype** (Figs 38A–C). Measurements: TL 2.66, PL 1.18, PW 1.52, EL 1.48, EW 1.60, GD 1.41. Ratios: PL/PW 0.78, EL/EW 0.93, EL/PL 1.25, GD/EW 0.88, TL/EW 1.66. **Body** elongate, robust, subcylindrical and convex; dorsal and ventral surfaces blackish and shiny; mouthparts, legs, tarsi and antennae reddish-brown; dorsal surface glabrous. **Head** concave, hidden by the pronotum; punctation shallow, sparse, with microreticulate sculpture between punctures; dorsal surface mostly glabrous, but with erect yellowish bristles mainly near each eye and over the labrum; frontoclypeal ridge sinuous, the sides slightly projected forward and upward. **Mouthparts** with distinct asymmetric mandibles, in which the left mandible bears a conspicuous tooth directed upward (Fig. 40A, arrow); labrum protruding. **Eyes** coarsely faceted with GW of 0.2 mm. Each **antenna** with ten antennomeres (right antenna measured; FL 0.16, CL 0.22, CL/FL 1.37), light colored at base; length of antennomeres one to ten as follows: 0.09, 0.05, 0.05, 0.04, 0.03, 0.02, 0.02, 0.07, 0.06, 0.09; antennal club robust, in which each antennomere has some erect setae about the four conspicuous sensillifers symmetrically positioned and a lower region with scale-like cuticle; each antennal sensillifer formed by a group of short setae arranged in concentric layers. **Pronotum** with dual punctation, consisting of scarce minute punctures about a third the size of the largest ones and devoid of setae, barely visible even in high magnifications (>80X), and irregularly distributed coarse punctures; anterior portion with transversely stretched punctation; distance between coarse punctures from 1 to 2.5 puncture-widths; in between punctures microreticulated and shiny; each coarse puncture bearing a yellowish decumbent minute seta; anterior edge with its median portion forming a projection, its anteriormost margin rounded and its lateral margins distinctly straight;

anterolateral angles rounded, not produced; lateral margins not visible from above, with a few long erect yellowish setae along them. **Scutelum** with BW of 0.15 mm, subtriangular, smooth and shiny. **Elytra** with punctation slightly denser and deeper than that of pronotum; vestiture consisting of minute fine decumbent yellowish setae; surface between punctures smooth and shiny; distance between punctures from 1 to 3 puncture-widths; posterior portion bearing two conspicuous calli, one in each side close of the elytral suture (Figs 38A–B, arrows); lateral and posterolateral margins carinated, broadly rounded, with long erect yellowish setae, barely visible in dorsal view. **Hind wings** developed (macropterous). **Ventral sclerites** (Fig. 38C) with most of their surfaces finely reticulate and vestiture of decumbent slender setae. **Prosternal disc** concave in front of coxae, finely reticulate, devoid of carina at the longitudinal midline; prosternal process very short, laminate, acute at apex. **Metaventricle** moderately convex, with disc almost glabrous; lateral sides finely reticulate; discrimen indiscernible. **Abdominal ventrites** 0.69 mm long at midline; vestiture of sparse slender setae; shallow and sparse punctures; length of the abdominal ventrites one to five (from base to apex at the longitudinal midline) as follows: 0.28, 0.1, 0.09, 0.13, 0.09; first abdominal ventrite with a basal width of 0.94 mm and bearing a margined, circular setose sex patch (Fig. 38C, arrow) located at its middle, the patch with a transverse diameter of 0.03 mm. **Tibiae** expanded and with a row of teeth along their entire outer margin; protibia with an area of long slender yellowish setae concentrated at its inner surface. **Abdominal terminalia** in paratype (Figs 39A–F): **Ninth segment** (Fig. 39C) V-shaped with an erect seta at each expanded apex. **Eight tergite** (Fig. 39A) with posterior margin almost straight, bearing long bristles; lateral margins diverging; anterior margin concave, slightly sclerotized at sides. **Eight sternite** (Fig. 39B) with posterior margin rounded, bearing few long curved bristles at sides; lateral margins contiguous to the posterior margin, forming a thin projection on each side; anterior margin biconcave, rounded and sclerotized at middle, forming a short median strut. **Aedeagus** (Fig. 39D) about 3x as long as wide. **Basal piece** (Fig. 39F) subtriangular, membranous, with rounded angles; posterior margin arched inward forming two lateral lobes. **Tegmen** (Fig. 39D, dotted lines) twice as wide and 1.5x as long as penis, with anterior portion subtriangular; lateral margins subparallel, slightly diverging to apex; posterior portion of its ventral surface with a V-shaped emargination of about one-fifth the length of tegmen, forming two lateral lobes, each lobe with a patch of sensillae at the apex. **Penis** (Fig. 39E) subtriangular (excluding the struts on its anterior border),

about 3x as long as wide, divided into a dorsal membranous lobe and a ventral lobe of about a third the length of the penis, not sclerotized; membranous lobe forming a subtriangular apex with a row of sensillae along each side of the ejaculatory duct; ventral membranous lobe forming a subtriangular apex; sublateral margins converging to apex; anterior edge with a couple of long and narrow struts forming a V-shaped emargination.

Variation: males, measurements (n = 3, including the holotype): TL 2.66–2.90 (2.80 ± 0.12); PL 1.11–1.18 (1.14 ± 0.04); PW 1.52–1.63 (1.58 ± 0.06); EL 1.48–1.76 (1.65 ± 0.15); EW 1.60–1.73 (1.65 ± 0.07); GD 1.23–1.53 (1.39 ± 0.15). Ratios: PL/PW 0.70–0.78 (0.72 ± 0.04); EL/EW 0.93–1.07 (1.00 ± 0.07); EL/PL 1.25–1.55 (1.45 ± 0.17); GD/EW 0.76–0.88 (0.84 ± 0.07); TL/EW 1.66–1.76 (1.70 ± 0.05). Any important morphological variation was found in males of this species. Females (Figs 38D–F), measurements (n = 14): TL 2.34–3.19 (2.83 ± 0.25); PL 1.03–1.39 (1.23 ± 0.12); PW 1.31–1.86 (1.61 ± 0.14); EL 1.31–1.84 (1.61 ± 0.17); EW 1.45–1.94 (1.72 ± 0.14); GD 0.97–1.74 (1.48 ± 0.20). Ratios: PL/PW 0.72–0.85 (0.76 ± 0.04); EL/EW 0.83–1.01 (0.93 ± 0.06); EL/PL 1.07–1.49 (1.31 ± 0.12); GD/EW 0.67–0.96 (0.86 ± 0.08); TL/EW 1.51–1.71 (1.64 ± 0.05). Similar to males except in the following features: head flat; left mandible devoid of projected tooth; anterior portion of pronotum with coarse and deep transversely stretched punctation. Abdominal sex patch present (Fig. 40B, arrow), being the first report in the genus and making females and males difficult to separate without seeing the mandibular tooth. Female abdominal terminalia not examined.

Type material: CAMEROON: male holotype (MFNB) \Kamerun Mokundange 1-15 VI 05 G. Teßmann S. G [printed]\ 1185-98 [handwritten]\ [red label] HOLOTYPE *Xylographus* sp. nov. 03 Sandoval-Gómez & Lopes-Andrade [handwritten]; 2 males, 11 females paratypes (MFNB) \Kamerun Mokundange 1-15 VI 05 G. Teßmann S. G. [printed]\ 1185-98 [handwritten]\ [yellow label] PARATYPE *Xylographus* sp. nov. 03 Sandoval-Gómez & Lopes-Andrade [handwritten].

Additional material: 3 specimens. DEMOCRATIC REPUBLIC OF THE CONGO: 2 females (KMMA) \MUSÉE DU CONGO TENGO KATANTA MANYEMA 1918 Dr. Gérard [printed]. EQUATORIAL GUINEA: 1 female (MFNN) \Alén [printed]\ Span. Guinea Benitogbt. 6.X 06 G. Teßmann S. G [printed].

Host fungi: unknown.

Distribution: Central Africa from Cameroon, Equatorial Guinea and Democratic Republic of the Congo (Fig. 53).

Xylographus sp. nov. 04 Sandoval-Gómez & Lopes-Andrade, 2013

(Figs 41–42)

Xylographus sp. nov. 04 Sandoval-Gómez & Lopes-Andrade 2013. Type locality: Côte d'Ivoire, Parc du Banco.

Diagnosis: Males with small-sized body (3.24 mm); dorsal vestiture consisting of minute setae, shorter than a puncture-width. Left mandible bearing an upward tooth. Pronotum and elytra with coarse regular punctation; surface between punctures conspicuously microreticulated. Anterior edge of pronotum with its median portion projected forward, its anteriormost margin being straight; lateral margins distinctly sinuous. Penis subtriangular, less than half the length of tegmen; dorsal membranous lobe forming a rounded apex; sclerotized arch of the ventral lobe about a half the length of the penis, shorter than the dorsal lobe; anterior edge with a couple of struts forming a V-shaped emargination, slightly straight on the posterior part.

Description: **male holotype** (Figs 41A–C). Measurements: TL 3.24, PL 1.34, PW 1.71, EL 1.90, EW 1.84, GD 1.64. Ratios: PL/PW 0.78, EL/EW 1.03, EL/PL 1.42, GD/EW 0.89, TL/EW 1.76. **Body** elongate, robust, subcylindrical and convex; dorsal, ventral surfaces and legs blackish and shiny; mouthparts, tarsi and antennae reddish-brown; dorsal surface glabrous. **Head** flat, hidden partially by the pronotum; punctation shallow, sparse, with microreticulate sculpture between punctures; dorsal surface mostly glabrous, but with erect yellowish bristles mainly near each eye and over the labrum; frontoclypeal ridge sinuous, the sides slightly projected forward and upward; each lateral margin of vertex just behind the eye elevated into a small subtriangular tubercle. **Mouthparts** with distinct asymmetric mandibles, in which the left mandible bears a small tooth directed upward (Fig. 41B, arrow); labrum protruding. **Eyes** coarsely faceted with GW of 0.22 mm. Each **antenna** with ten antennomeres (right antenna

measured; FL 0.15, CL 0.23, CL/FL 1.53), light colored at base; length of antennomeres one to ten as follows: 0.1, 0.05, 0.07, 0.03, 0.02, 0.02, 0.01, 0.07, 0.07, 0.09; antennal club robust, in which each antennomere has a sinuous row of erect setae that divides it in an upper region bearing four conspicuous sensillifers symmetrically positioned and a lower region with scale-like cuticle; each antennal sensillifer formed by a group of short setae arranged in concentric layers. **Pronotum** with dual punctation, consisting of scarce minute punctures about a third the size of the largest ones and devoid of setae, barely visible even in high magnifications (>80X), and uniformly distributed coarse punctures; distance between coarse punctures from 1 to 3 puncture-widths; in between punctures conspicuously microreticulated and shiny; each large puncture bearing a yellowish decumbent minute seta; anterior edge with its median portion forming a projection, its anteriormost margin straight and its lateral margins distinctly straight; anterolateral angles rounded, not produced; lateral margins not visible from above, with a few long erect yellowish setae along them. **Scutelum** with BW of 0.15 mm, subtriangular, smooth and shiny. **Elytra** with similar punctation than that of pronotum; vestiture consisting of minute fine decumbent yellowish setae; surface between punctures smooth and shiny; lateral and posterolateral margins carinated, broadly rounded, with long erect yellowish setae, not visible from above. **Hind wings** developed (macropterous). **Ventral sclerites** (Fig. 41C) with most of their surfaces finely reticulate and vestiture of abundant decumbent slender setae. **Prosternal disc** concave in front of coxae, finely reticulate, devoid of carina at the longitudinal midline; prosternal process very short, laminate, acute at apex. **Metaventricle** moderately convex, with disc almost glabrous; lateral sides with coarse, irregular, sparse punctation; discrimen indiscernible. **Abdominal ventrites** 0.65 mm long at midline; vestiture of sparse slender setae; shallow and sparse punctures; length of the abdominal ventrites one to five (from base to apex at the longitudinal midline) as follows: 0.27, 0.08, 0.1, 0.09, 0.11; first abdominal ventrite with a basal width of 1.2 mm and bearing a margined, circular setose sex patch (Fig. 41C, arrow) located at its middle, the patch with a transverse diameter of 0.06 mm. **Tibiae** expanded and with a row of teeth along their entire outer margin; protibia with an area of long slender yellowish setae concentrated at its inner surface. **Abdominal terminalia** in holotype (Figs 42A–D): **Ninth segment** (Fig. 42C) V-shaped with an erect seta at each expanded apex. **Eight tergite** (Fig. 42A, broken, dashed line) with posterior margin rounded, bearing long bristles; lateral margins diverging; anterior margin concave, slightly sclerotized at sides.

Eight sternite (Fig. 42B) with posterior margin rounded, bearing few long curved bristles at sides; lateral margins contiguous to the posterior margin, forming a thin projection on each side; anterior margin biconcave, rounded and sclerotized at middle, forming a short median strut. **Aedeagus** (Fig. 42D) about 2.2x as long as wide. **Basal piece** not observed. **Tegmen** (Fig. 42D, dotted lines) twice as wide and 2.5x as long as penis, with anterior portion subtriangular; lateral margins convex, slightly diverging to apex; posterior portion of its ventral surface with a V-shaped emargination of about one-fifth the length of tegmen, forming two lateral lobes, each lobe with a patch of sensillae at the apex. **Penis** (Fig. 42D, dotted lines) subtriangular (excluding the struts on its anterior border), about 1.5x as long as wide, divided into a long dorsal membranous lobe and a short ventral sclerotized lobe of about a half the length of the penis; membranous lobe forming a rounded apex, with a row of sensillae along each side of the ejaculatory duct; sclerotized arch of the ventral lobe rounded; convex lateral margins converging to apex; anterior edge with a couple of struts forming a V-shaped emargination, slightly straight on the posterior part.

Females (Figs 41D–F): Measurements: TL 3.51, PL 1.44, PW 1.83, EL 2.07, EW 1.99, GD 1.81. Ratios: PL/PW 0.79, EL/EW 1.04, EL/PL 1.44, GD/EW 0.91, TL/EW 1.76. Similar to male except in the following features: abdominal sex patch absent; left mandible devoid of projected tooth; anterior edge of pronotum rounded, not produced; pronotum and elytra with coarse and dense punctation; anterior portion of pronotum with deep transversely stretched punctation. Female abdominal terminalia not examined.

Type material: IVORY COAST: male holotype (MHNG) \Côte d'Ivoire Parc du Banco 14.III.77 I. I. Löbl [printed] \ [red label] HOLOTYPE *Xylographus* sp. nov. 04 Sandoval-Gómez & Lopes-Andrade [handwritten]; 1 female paratype (MHNG) \Côte d'Ivoire Parc du Banco 18.III.77 I. I. Löbl [printed] \ [yellow label] PARATYPE *Xylographus* sp. nov. 04 Sandoval-Gómez & Lopes-Andrade [handwritten].

Host fungi: unknown.

Distribution: Ivory Coast (Fig. 53).

Xylographus sp. nov. 05 Sandoval-Gómez & Lopes-Andrade, 2013

(Figs 43–44)

Xylographus sp. nov. 05 Sandoval-Gómez & Lopes-Andrade 2013. Type locality: Kamerun, Nau-Kamerun.

Diagnosis: Males with small-sized body (3.32–3.67); dorsal vestiture consisting of minute setae, shorter than a puncture-width. Left mandible devoid of upward tooth. Pronotum with coarse transversely stretched punctation on its anterior portion; surface between punctures conspicuously microreticulated; elytral punctation sparse and fine. Anterior edge of pronotum with its median portion projected forward, its anteriormost margin being rounded; lateral margins distinctly straight (Fig. 43B, arrow). Penis subconical, about three fourths the length of tegmen; dorsal membranous lobe forming an expanded rounded apex; sclerotized arch of the ventral lobe about a third the length of the penis, rounded; anterior edge with a couple of narrow and long struts, forming a V-shaped emargination with curved inward tips.

Description: **male holotype** (Figs 43A–C). Measurements: TL 3.62, PL 1.54, PW 1.97, EL 2.08, EW 2.01, GD 1.85. Ratios: PL/PW 0.78, EL/EW 1.03, EL/PL 1.35, GD/EW 0.92, TL/EW 1.80. **Body** elongate, robust, subcylindrical and convex; dorsal and ventral surfaces blackish and shiny; mouthparts, legs and antennae reddish-brown; yellowish tarsi; dorsal surface glabrous. **Head** flat, hidden partially by the pronotum; punctation shallow, sparse, with microreticulate sculpture between punctures; dorsal surface mostly glabrous, but with erect yellowish bristles mainly near frontoclypeus ridge, each eye and over the labrum; frontoclypeal ridge sinuous, the sides slightly projected forward and upward. **Mouthparts** without distinct asymmetric mandibles; labrum protruding. **Eyes** coarsely faceted with GW of 0.2 mm. Each **antenna** with ten antennomeres (left antenna measured; FL 0.16, CL 0.25, CL/FL 1.56); length of antennomeres one to ten as follows: 0.12, 0.05, 0.06, 0.03, 0.03, 0.02, 0.02, 0.07, 0.07, 0.11; antennal club robust, in which each antennomere has a sinuous row of erect setae that divides it in an upper region bearing four conspicuous sensillifers symmetrically positioned and a lower region with scale-like cuticle; each antennal sensillifer formed by a group of short setae arranged in concentric layers. **Pronotum** with dual punctation, consisting of scarce minute punctures about a third the size of the largest ones and

devoid of setae, barely visible even in high magnifications (>80X), and coarse transversely stretched punctation; distance between coarse punctures from 1 to 3 puncture-widths; in between punctures conspicuously microreticulated and shiny; each coarse puncture bearing a yellowish decumbent minute seta; anterior edge with its median portion forming a projection, its anteriormost margin rounded and its lateral margins distinctly straight (Fig. 43B, arrow); anterolateral angles rounded, not produced; lateral margins not visible from above, with several long erect yellowish setae along them. **Scutelum** with BW of 0.19 mm, subtriangular, smooth and shiny. **Elytra** with punctation sparser and finer than that of the posterior portion of pronotum; vestiture consisting of minute fine decumbent yellowish setae; surface between punctures smooth and shiny; lateral and posterolateral margins carinated, broadly rounded, with long erect yellowish setae, barely visible from above. **Hind wings** developed (macropterous). **Ventral sclerites** (Fig. 43C) with most of their surfaces finely reticulate and vestiture of decumbent slender setae. **Prosternal disc** concave in front of coxae, finely reticulate, devoid of carina at the longitudinal midline; prosternal process very short, laminate, acute at apex. **Metaventricle** moderately convex, with disc almost glabrous; lateral sides with coarse, irregular, sparse punctation; discrimen indiscernible. **Abdominal ventrites** 1.07 mm long at midline; vestiture of dense slender setae; shallow and sparse punctures; length of the abdominal ventrites one to five (from base to apex at the longitudinal midline) as follows: 0.4, 0.16, 0.13, 0.14, 0.24; first abdominal ventrite with a basal width of 1.29 mm and bearing a margined, circular setose sex patch (Fig. 43C, arrow) located at its middle, the patch with a transverse diameter of 0.06 mm. **Tibiae** expanded and with a row of teeth along their entire outer margin; protibia with an area of long slender yellowish setae concentrated at its inner surface. **Abdominal terminalia** in paratype (Figs 44A–F): **Ninth segment** (Fig. 44C) V-shaped with an erect seta at each apex. **Eight tergite** (Fig. 44A) with posterior margin rounded, bearing long bristles; lateral margins diverging; anterior margin concave, slightly sclerotized at sides. **Eight sternite** (Fig. 44B) with posterior margin rounded, bearing few long curved bristles at sides; lateral margins contiguous to the posterior margin, forming a thin projection on each side; anterior margin biconcave, rounded and sclerotized at middle, forming a well-developed median projection extending beyond the lateral projections, with a short median strut. **Aedeagus** (Fig. 44D) about 2.5x as long as wide. **Basal piece** (Fig. 44F) subtriangular, membranous, with rounded angles; posterior margin arched inward forming two lateral lobes.

Tegmen (Fig. 44D, dotted lines) 1.6x as wide and 1.6x as long as penis, with anterior portion subtriangular; lateral margins subparallel, slightly diverging to apex; posterior portion of its ventral surface with a V-shaped emargination of about one-fifth the length of tegmen, forming two lateral lobes, each lobe with a patch of sensillae at apex. **Penis** (Fig. 44E) subconical, about 2.5x as long as wide, divided into a dorsal membranous lobe and a ventral sclerotized lobe of about a third the length of the penis; membranous lobe forming an expanded rounded apex with a row of sensillae along each side of the ejaculatory duct; sclerotized arch of the ventral lobe rounded, reaching the top of the membranous lobe; convex lateral margins converging to apex; anterior edge with a couple of narrow and long struts, forming a V-shaped emargination with curved inward tips.

Variation: males, measurements (n = 4, including the holotype): TL 3.32–3.67 (3.54 ± 0.15); PL 1.35–1.54 (1.46 ± 0.08); PW 1.84–1.97 (1.92 ± 0.07); EL 1.97–2.23 (2.08 ± 0.11); EW 1.91–2.10 (2.00 ± 0.08); GD 1.78–1.85 (1.83 ± 0.03). Ratios: PL/PW 0.73–0.80 (0.76 ± 0.04); EL/EW 1.03–1.06 (1.04 ± 0.02); EL/PL 1.34–1.55 (1.42 ± 0.10); GD/EW 0.88–0.93 (0.91 ± 0.02); TL/EW 1.74–1.80 (1.77 ± 0.03). Any important morphological variation was found in males of this species. Females (Figs 43D–F), measurements (n = 3): TL 3.47–3.65 (3.59 ± 0.10); PL 1.49–1.58 (1.52 ± 0.05); PW 1.82–1.89 (1.85 ± 0.04); EL 1.98–2.14 (2.06 ± 0.08); EW 1.94–2.10 (2.00 ± 0.09); GD 1.76–1.84 (1.80 ± 0.04). Ratios: PL/PW 0.81–0.84 (0.82 ± 0.01); EL/EW 0.99–1.09 (1.03 ± 0.05); EL/PL 1.31–1.43 (1.36 ± 0.06); GD/EW 0.88–0.91 (0.90 ± 0.02); TL/EW 1.74–1.85 (1.79 ± 0.05). Similar to males except in the following features: abdominal sex patch absent; anterior portion of pronotum with coarser transversely stretched punctuation. Female abdominal terminalia not examined.

Type material: CAMEROON: male holotype (MFNB) \Neu-Kamerun No 3209-48 Tessmann S. G. [printed] \ [red label] HOLOTYPE *Xylographus* sp. nov. 05 Sandoval-Gómez & Lopes-Andrade [handwritten]; 3 males, 1 female paratypes (MFNB) \Neu-Kamerun No 3209-48 Tessmann S. G. [printed] \ [yellow label] PARATYPE *Xylographus* sp. nov. 05 Sandoval-Gómez & Lopes-Andrade [handwritten].

Additional material: 2 specimens. CAMEROON: 1 female (MFNB) \Kamerun Joh-Albrechtshöhe 25.III-10.IV.98 L. Conradt S. [printed]\. EQUATORIAL GUINEA: 1 female (MFNB) \Spau. Guinea Nkolentangan XI.07.-V.08. G. Teßmann S. G. [printed]\.

Host fungi: unknown.

Distribution: Cameroon and Equatorial Guinea (Fig. 53).

Xylographus sp. nov. 06 Sandoval-Gómez & Lopes-Andrade, 2013

(Figs 45–46)

Xylographus sp. nov. 06 Sandoval-Gómez & Lopes-Andrade 2013. Type locality: Côte d'Ivoire, Man, 3 Km. O. de Sangouiné.

Diagnosis: Males with small-sized body (2.03–2.23); dorsal vestiture consisting of minute setae, shorter than a puncture-width. Left mandible bearing an upward tooth. Pronotum with coarse transversely stretched punctation on its anterior portion; surface between punctures conspicuously microreticulated; elytral punctation coarse. Anterior edge of pronotum with its median portion projected forward, its anteriormost margin being rounded; lateral margins distinctly straight. Penis subcylindrical, about two thirds the length of tegmen; dorsal membranous lobe forming a subtriangular apex; ventral membranous lobe about a third the length of the penis, forming a subtriangular apex; anterior edge with a couple of long and narrow struts forming a V-shaped emargination.

Description: **male holotype** (Figs 45A–C). Measurements: TL 2.23, PL 0.91, PW 1.19, EL 1.32, EW 1.28, GD 1.10. Ratios: PL/PW 0.76, EL/EW 1.03, EL/PL 1.45, GD/EW 0.86, TL/EW 1.74. **Body** elongate, robust, subcylindrical and convex; dorsal surface blackish and very shiny; ventral surfaces, mouthparts, legs and antennae reddish-brown; yellowish tarsi; dorsal surface glabrous. **Head** flat, hidden partially by the pronotum; punctation shallow, sparse, with microreticulate sculpture between punctures; dorsal surface glabrous, but with erect yellowish bristles mainly near each eye and over the labrum; frontoclypeal ridge sinuous, the sides slightly projected forward and upward; each lateral margin of vertex just behind the eye elevated into an

angle. **Mouthparts** with distinct asymmetric mandibles, in which the left mandible bears a conspicuous tooth directed upward (Fig. 45B, arrow); labrum protruding. **Eyes** coarsely faceted with GW of 0.17 mm. Each **antenna** with ten antennomeres (left antenna measured; FL 0.14, CL 0.16, CL/FL 1.14), light colored at base; length of antennomeres one to ten as follows: 0.07, 0.06, 0.07, 0.03, 0.02, 0.01, 0.01, 0.05, 0.04, 0.07; antennal club robust, in which each antennomere has a sinuous row of erect setae that divides it in an upper region bearing four conspicuous sensillifers symmetrically positioned and a lower region with scale-like cuticle; each antennal sensillifer formed by a group of short setae arranged in concentric layers. **Pronotum** with dual punctation, consisting of scarce minute punctures about a third the size of the largest ones and devoid of setae, barely visible even in high magnifications (>80X), and coarse transversely stretched punctation; distance between coarse punctures from 1 to 3 puncture-widths; in between punctures conspicuously microreticulated; each large puncture bearing a yellowish decumbent minute seta; anterior edge with its median portion forming a projection, its anteriormost margin rounded and its lateral margins distinctly straight (Fig. 43B, arrow); anterolateral angles rounded, not produced; lateral margins not visible from above, with some long erect yellowish setae along them. **Scutelum** with BW of 0.11 mm, subtriangular, smooth and shiny. **Elytra** with punctures coarser than that of the posterior portion of pronotum; vestiture consisting of minute fine decumbent yellowish setae; surface between punctures smooth and shiny; lateral and posterolateral margins carinated, broadly rounded, with long erect yellowish setae, barely visible in dorsal view. **Hind wings** developed (macropterous). **Ventral sclerites** (Fig. 45C) with most of their surfaces finely reticulate and vestiture of decumbent slender setae. **Prosternal disc** concave in front of coxae, finely reticulate, devoid of carina at the longitudinal midline; prosternal process very short, laminate, acute at apex. **Metaventricle** moderately convex, disc with some long yellowish setae; lateral sides with coarse, irregular, sparse punctation; discrimen discernible. **Abdominal ventrites** 0.67 mm long at midline; vestiture of sparse slender setae; shallow and sparse punctures; length of the abdominal ventrites one to five (from base to apex at the longitudinal midline) as follows: 0.26, 0.08, 0.08, 0.09, 0.16; first abdominal ventrite with a basal width of 0.82 mm and bearing a margined, circular setose sex patch (Fig. 45C, arrow) located at its middle, the patch with a transverse diameter of 0.03 mm. **Tibiae** expanded and with a row of teeth along their entire outer margin; protibia with an area of long slender yellowish setae concentrated at its inner surface. **Abdominal**

terminalia in paratype (Figs 46A–E): **Ninth segment** (Fig. 46C, broken, dashed line) with an erect seta at its apex. **Eight tergite** (Fig. 46A) with posterior margin rounded, bearing long bristles; lateral margins diverging; anterior margin concave, slightly sclerotized at sides. **Eight sternite** (Fig. 46B, broken, dashed line) with posterior margin rounded, bearing few long curved bristles at sides; lateral margins contiguous to the posterior margin, forming a thin projection on each side; anterior margin biconcave, rounded. **Aedeagus** (Fig. 46D) about 2.7x as long as wide. **Basal piece** (Fig. 46E) subtriangular, membranous, with rounded angles. **Tegmen** (Fig. 46D, dotted lines) 1.7x as wide and 1.5x as long as penis, with anterior portion subtriangular; lateral margins subparallel, abruptly diverging to apex; posterior portion of its ventral surface with a V-shaped emargination of about one-fifth the length of tegmen, forming two lateral lobes, each lobe with a patch of sensillae at the apex. **Penis** (Fig. 46D, dotted lines) subcylindrical, about 3x as long as wide, divided into a dorsal membranous lobe and a ventral lobe of about a third the length of the penis, not sclerotized; membranous lobe forming a subtriangular apex with a row of sensillae along each side or the ejaculatory duct; ventral membranous lobe forming a subtriangular apex; sublateral margins converging to apex; anterior edge with a couple of long and narrow struts forming a V-shaped emargination.

Variation: males, measurements (n = 2, including the holotype): TL 2.03–2.23 (2.13 ± 0.14); PL 0.80–0.91 (0.86 ± 0.08); PW 1.10–1.19 (1.15 ± 0.06); EL 1.23–1.32 (1.28 ± 0.06); EW 1.19–1.28 (1.24 ± 0.06); GD 0.99–1.10 (1.05 ± 0.08). Ratios: PL/PW 0.73–0.76 (0.75 ± 0.03); EL/EW 1.03; EL/PL 1.45–1.54 (1.49 ± 0.06); GD/EW 0.83–0.86 (0.85 ± 0.02); TL/EW 1.71–1.74 (1.72 ± 0.03). Any important morphological variation was found in males of this species. Females (Figs 45D–F), measurements (n = 2): TL 2.08–2.20 (2.14 ± 0.08); PL 0.92–0.94 (0.93 ± 0.01); PW 1.13–1.16 (1.15 ± 0.02); EL 1.16–1.26 (1.21 ± 0.07); EW 1.18–1.19 (1.19 ± 0.01); GD 1.12–1.16 (1.14 ± 0.03). Ratios: PL/PW 0.81; EL/EW 0.98–1.06 (1.02 ± 0.05); EL/PL 1.26–1.34 (1.30 ± 0.06); GD/EW 0.95–0.97 (0.96 ± 0.02); TL/EW 1.76–1.85 (1.81 ± 0.06). Similar to males except in the following features: abdominal sex patch absent; head punctation comparatively coarser; left mandible devoid of projected tooth; anterior portion of pronotum with coarse punctation. Female abdominal terminalia not examined.

Type material: IVORY COAST: male holotype (MHNG) \Côte d'Ivoire Man 3 km. O. de Sangouiné 10.III.77 I. Löbl [printed]\ [red label] HOLOTYPE *Xylographus* sp. nov. 06 Sandoval-Gómez & Lopes-Andrade [handwritten]\; 1 male, 2 females paratypes (MHNG) \Côte d'Ivoire Man 2 km. O. de Sangouiné 10.III.77 I. Löbl [printed]\ [yellow label] PARATYPE *Xylographus* sp. nov. 06 Sandoval-Gómez & Lopes-Andrade [handwritten]\.

Host fungi: unknown.

Distribution: Ivory Coast (Fig. 53).

***Xylographus* sp. nov. 07 Sandoval-Gómez & Lopes-Andrade, 2013**

(Figs 47–48)

Xylographus sp. nov. 07 Sandoval-Gómez & Lopes-Andrade 2013. Type locality: Democratic Republic of the Congo, Mont Kabobo, terr. Albert-ville, Hte Kiymbi.

Diagnosis: Males with median-sized body (3.72–4.25); dorsal vestiture consisting of minute setae, shorter than a puncture-width. Left mandible bearing an upward tooth. Pronotum with fine punctation; elytral punctation coarse. Anterior edge of pronotum with its median portion projected forward, its anteriormost margin being rounded, straight or angulated at middle; lateral margins distinctly arched inward. Penis subcylindrical, about three fourths the length of tegmen; dorsal membranous lobe forming an acute apex; sclerotized arch of the ventral lobe (Fig. 48E, arrow) about a third the length of the penis, forming a subtriangular apex; anterior edge with a couple of long and narrow struts forming a V-shaped emargination.

Description: **male holotype** (Figs 47A–C). Measurements: TL 4.25, PL 1.69, PW 2.25, EL 2.56, EW 2.39, GD 2.22. Ratios: PL/PW 0.75, EL/EW 1.07, EL/PL 1.51, GD/EW 0.93, TL/EW 1.78. **Body** elongate, robust, subcylindrical and convex; dorsal and ventral surfaces blackish and shiny; mouthparts, tarsi and antennae reddish-brown; dorsal surface glabrous. **Head** concave, hidden partially by the pronotum; punctation shallow, sparse, with microreticulate sculpture between punctures; dorsal surface mostly

glabrous, but with erect yellowish bristles mainly near each eye and over the labrum; frontoclypeal ridge sinuous, the sides slightly projected forward and upward; each lateral margin of vertex just behind the eye elevated into a subtriangular tubercle. **Mouthparts** with distinct asymmetric mandibles, in which the left mandible bears a conspicuous tooth directed upward (Fig. 47B, arrow); labrum protruding. **Eyes** coarsely faceted with GW of 0.325 mm. Each **antenna** with ten antennomeres (right antenna measured; FL 0.23, CL 0.26, CL/FL 1.13), light colored at base; length of antennomeres one to ten as follows: 0.14, 0.09, 0.08, 0.05, 0.04, 0.03, 0.03, 0.08, 0.08, 0.1; antennal club robust, in which each antennomere has a sinuous row of erect setae that divides it in an upper region bearing four conspicuous sensillifers symmetrically positioned and a lower region with scale-like cuticle; each antennal sensillifer formed by a group of short setae arranged in concentric layers. **Pronotum** with dual punctation, consisting of scarce minute punctures about a third the size of the largest ones and devoid of setae, barely visible even in high magnifications (>80X), and uniformly distributed fine punctures; distance between fine punctures from 1.5 to 3 puncture-widths; in between punctures microreticulated and shiny; each fine puncture bearing a yellowish decumbent minute seta; anterior edge with its median portion forming a projection, its anteriormost margin straight and its lateral margins distinctly arched inward; anterolateral angles rounded, not produced; lateral margins not visible from above, with a few long erect yellowish setae along them. **Scutelum** with BW of 0.11 mm, subtriangular, smooth and shiny. **Elytra** with coarser punctation than that of pronotum; vestiture consisting of minute fine decumbent yellowish setae; surface between punctures smooth and shiny; lateral and posterolateral margins carinated, broadly rounded, with long erect yellowish setae, not visible from above. **Hind wings** developed (macropterous). **Ventral sclerites** (Fig. 47C) with most of their surfaces finely reticulate and vestiture of decumbent slender setae. **Prosternal disc** concave in front of coxae, finely reticulate, devoid of carina at the longitudinal midline; prosternal process very short, laminate, acute at apex. **Metaventricle** moderately convex, with disc almost glabrous; lateral sides with coarse, irregular, sparse punctation; discrimen indiscernible. **Abdominal ventrites** 1.19 mm long at midline; vestiture of sparse slender setae; shallow and sparse punctures; length of the abdominal ventrites one to five (from base to apex at the longitudinal midline) as follows: 0.5, 0.15, 0.15, 0.13, 0.26; first abdominal ventrite with a basal width of 1.5 mm and bearing a margined, circular setose sex patch (Fig. 47C, arrow) located at its middle, the patch with a transverse diameter of 0.04 mm. **Tibiae** expanded and with a

row of teeth along their entire outer margin; protibia with an area of long slender yellowish setae concentrated at its inner surface. **Abdominal terminalia** in paratype (Figs 48A–F): **Ninth segment** (Fig. 48C) V-shaped with an erect seta at each expanded apex. **Eight tergite** (Fig. 48A) with posterior rounded, bearing long bristles; lateral margins diverging; anterior margin concave, slightly sclerotized at sides. **Eight sternite** (Fig. 48B) with posterior margin rounded, bearing few long curved bristles at sides; lateral margins contiguous to the posterior margin, forming a thin projection on each side; anterior margin biconcave, rounded and sclerotized at middle, forming a developed median projection extending beyond the lateral projections, with a short median strut. **Aedeagus** about 3x as long as wide. **Basal piece** (Fig. 48F) subtriangular, membranous, with rounded angles; posterior margin arched inward forming two lateral lobes. **Tegmen** (Fig. 48D) twice as wide and 1.8x as long as penis, with anterior portion subtriangular; lateral margins subparallel, slightly diverging to apex; posterior portion of its ventral surface with a V-shaped emargination of about one-fifth the length of tegmen, forming two lateral lobes, each lobe with a patch of sensillae at the apex. **Penis** (Fig. 48E) subcylindrical, about 3.3x as long as wide, divided into a dorsal membranous lobe and a ventral sclerotized lobe of about a third the length of the penis; membranous lobe forming a sharpen angle on its apex with a row of sensillae along each side of the ejaculatory duct; sclerotized arch of the ventral lobe forming a subtriangular apex; lateral margins converging to apex; anterior edge with a couple of long and narrow struts forming a V-shaped emargination.

Variation: males, measurements (n = 5, including the holotype): TL 3.72–4.25 (3.96 ± 0.23); PL 1.52–1.70 (1.62 ± 0.08); PW 1.96–2.26 (2.13 ± 0.13); EL 2.13–2.56 (2.34 ± 0.17); EW 2.11–2.39 (2.29 ± 0.11); GD 1.93–2.22 (2.09 ± 0.12). Ratios: PL/PW 0.73–0.81 (0.76 ± 0.03); EL/EW 0.99–1.07 (1.02 ± 0.03); EL/PL 1.34–1.52 (1.45 ± 0.07); GD/EW 0.85–0.96 (0.91 ± 0.04); TL/EW 1.68–1.78 (1.73 ± 0.04). Any important morphological variation was found in males of this species. Females (Figs 47D–F), measurements in mm (n = 10): TL 3.61–4.22 (3.85 ± 0.20); PL 1.27–1.72 (1.53 ± 0.14); PW 1.88–2.22 (2.01 ± 0.10); EL 2.09–2.55 (2.32 ± 0.16); EW 2.06–2.33 (2.17 ± 0.10); GD 1.81–2.13 (2.00 ± 0.09). Ratios: PL/PW 0.60–0.85 (0.76 ± 0.08); EL/EW 0.99–1.14 (1.07 ± 0.05); EL/PL 1.32–1.99 (1.54 ± 0.21); GD/EW 0.87–0.97 (0.92 ± 0.03); TL/EW 1.63–1.94 (1.78 ± 0.09). Similar to males except in the following features: abdominal sex patch absent; head flat, punctation comparatively coarser; left mandible devoid of

projected tooth; anterior edge of pronotum rounded, not produced; anterior portion of pronotum with transversely stretched punctation. Female abdominal terminalia not examined.

Type material: 15 specimens. DEMOCRATIC REPUBLIC OF THE CONGO: male holotype (KMMA) \R.S.A.C.-MUS. CONGO Mont Kabobo, terr. Albert-ville, The Kiyambi 1800 m. B. 42 N. Leleup X-1958 [printed]\ Biot. N° 42 dans Amadouvier pourri [printed]\ Cisidae [handwritten] \ [red label] HOLOTYPE *Xylographus* sp. nov. 07 Sandoval-Gómez & Lopes-Andrade [handwritten]; 13 males, 10 females paratypes (KMMA) \R.S.A.C.-MUS. CONGO Mont Kabobo, terr. Albert-ville, The Kiyambi 1800 m. B. 42 N. Leleup X-1958 [printed]\ Biot. N° 42 dans Amadouvier pourri [printed]\ Cisidae [handwritten] \ [yellow label] PARATYPE *Xylographus* sp. nov. 07 Sandoval-Gómez & Lopes-Andrade [handwritten].

Host fungi: specimens were reported as being collected on a rotten log.

Distribution: Democratic Republic of the Congo (Fig. 52).

3.4. Identification key to male *Xylographus* Mellié, 1847 of the Afrotropical and Afrotropical regions

1. Dorsal vestiture consisting of short to minute setae. Long setae, if present, restricted to the lateral portions of pronotum and elytra.....**2**

1'. Dorsal vestiture dense, consisting of conspicuous long slender yellowish setae. Occurring in temperate and tropical continental Africa, from South Africa to Mali at the west and Eritrea at the east. Also known from Madagascar.....***Xylographus globipennis* Reitter, 1911**

2. Elytra without conspicuous pits (except for humeral calli).....**3**

2'. Elytra bearing two conspicuous calli at the posterior portion, one on each side close of the elytral suture (Figs 38A–B, arrows). Central Africa (Cameroon, Equatorial Guinea, eastern Democratic Republic of the Congo).....***Xylographus* sp. nov. 3**

3. Anterior projection of pronotum with lateral margins distinctly arched inward, even in the smallest males (Figs 3B,E; 4B, arrows).....	8
3'. Anterior projection of pronotum with lateral margins barely sinuous to straight (Figs 15B,E; 43B, arrows).....	4
4. Pronotum with anterior portion bearing regular coarse to transversely stretched coarse punctation, with surface between punctures conspicuously microreticulated.....	6
4'. Pronotum with anterior portion bearing regular fine punctation, with surface between punctures shallowly microreticulated.....	5
5. Anterior projection of pronotum conspicuously projected forward, beyond the head in lateral view. Eastern continental Africa, from Kenya to South Africa. Also in Seychelles and Madagascar.....	Xylographus madagascariensis Mellié, 1849
5'. Anterior projection of pronotum barely or not produced beyond head, seen in lateral view. Continental tropical Africa.....	Xylographus subopacus Pic, 1929
6. Anterior portion of pronotum with transversely stretched punctation.....	7
6'. Anterior portion of pronotum with coarse regular punctation. Ivory Coast.....	Xylographus sp. nov. 4
7. Left mandible with upward tooth (Fig. 45B, arrow). Ivory Coast.....	Xylographus sp. nov. 6
7'. Left mandible devoid of upward tooth. Cameroon and Equatorial Guinea.....	Xylographus sp. nov. 5
8. Pronotum with shallow to deep fine punctation.....	9
8'. Pronotum with deep coarse punctation. Eastern Africa (coasts of Tanzania, including Zanzibar, and Kenya).....	Xylographus perforatus Gerstaecker, 1871
9. Dorsal vestiture consisting of minute setae, shorter than a puncture-width.....	10
9'. Dorsal vestiture consisting of short erect setae (better seen in lateral view), longer than a puncture-width. Madagascar and Reunion.....	Xylographus subsinuatus Pic, 1916

10. Elytral punctation fine.....	12
10'. Elytral punctation distinctly coarse.....	11
11. Penis with sclerotized arch of the ventral lobe (Fig. 36E, arrow) more than half the length of penis. Western Africa to western Central Africa (Ghana, Equatorial Guinea and Democratic Republic of the Congo).....	Xylographus sp. nov. 2
11'. Penis with sclerotized arch of the ventral lobe (Fig. 48E, arrow) about one-third the length of penis. Known only from Mt. Kabobo, at the western margin of Lake Tanganyika.....	Xylographus sp. nov. 7
12. Elytral punctation sparse and shallow, similar to that of pronotum, with punctures usually separated from each other by three puncture-widths.....	13
12'. Elytral punctation dense and deep, with punctures separated by one to three puncture-widths. Madagascar.....	Xylographus hypocritus Mellié, 1849
13. Penis three-fourths the length of tegmen. Benin, São Tomé and Cameroon.....	Xylographus nitidissimus Pic, 1916
13'. Penis less than half the length of tegmen.....	14
14. EL/PL > 1.27.....	15
14'. EL/PL < 1.20 (1.05–1.19). Madagascar.....	Xylographus anthracinus Mellié, 1849
15. TL < 4 mm (2.91–3.56). Madagascar.....	Xylographus bicolor Pic, 1916
15'. TL > 4 mm (4.38–6.06). Madagascar.....	Xylographus sp. nov. 1

4. Discussion

4.1. Morphological remarks

Xylographus was included in Orophini due to its projected subconical procoxae and expanded protibiae with spinose outer margin, short concave prosternum with laminate prosternal process and metaventrite devoid of discrimen [21–22]. Also included in the tribe are the Holarctic Ropalodontus Mellié and Octotemnus Mellié, the

Palaearctic *Hyalocis* Kawanabe and the Afrotropical *Paratrichapus* Scott. Therefore, the unique genera currently included in Orophini and occurring in tropical and subtropical lands are *Paratrichapus* and *Xylographus*, the former being monospecific and known only from the type series collected in Seychelles, and the latter widespread and abundant in the southern hemisphere. Among Orophini, *Ropalodontus* and *Octotemnus* share a similar flap cover of male abdominal sex patch, the former usually with conspicuous dorsal vestiture and antennae with ten antennomeres, while *Octotemnus* species are usually glabrous and elongate, bear eight antennomeres, and male mandibles are usually developed and projected forward. *Hyalocis* differs in the antennae with nine antennomeres and absence of conspicuous secondary sexual features, including male abdominal sex patch, and *Paratrichapus* differs in the spines of tibiae restricted to their apices. The eighth abdominal sternite of males with a short median strut in the anterior margin is a feature shared by most *Xylographus* and *Octotemnus* [23–24]. Antennal clubs of *Xylographus* and *Paratrichapus* are very similar (see the diagnosis for *Xylographus* provided here and Scott [25]) and the latter is a controversial genus and possibly a synonym of *Xylographus*.

However, the abovementioned diagnostic characteristics for Orophini are observed in ciids currently included in the other two tribes of Ciinae, Ciini and *Xylographellini*. Among Ciini, species of *Ceracis* Mellié are similar in being usually glabrous dorsally, in prosternal and coxal features, but protibiae are not or barely expanded and spines are restricted to their apices or, at most, reaching their outer apical angle. *Phellinocis* Lopes-Andrade & Lawrence has similar prosternum, but tibiae resemble those of *Ceracis* except for protibiae, which is devoid of apical spines and with outer angle produced in a bidentate tooth. *Odontocis* Nakane & Nobuchi, *Paraxestocis* Miyatake and *Wagaicis* Lohse have carinate prosternum, slightly to conspicuously expanded tibiae and spines distributed from apex to at least the apical two-thirds of the outer margin. *Malacocis* Gorham and *Sulcacis* Dury have short prosternum, tibiae are not expanded and spines are restricted to the protibial apices, although the former has a strap-like and the latter a broad, tapering prosternal process. All the abovementioned Ciini genera and Orophini also share a reduced female abdominal terminalia, with gonostyli reduced or absent, gonocoxites transversely divided in no more than two parts, paraprocts very reduced, apex of proctiger close to apex of vagina, and baculi of each side of proctiger and paraprocts usually contiguous

and broadly curved. *Acanthocis* Miyatake, *Falsocis* Pic and *Porculus* Lawrence also have subconical procoxae and short prosternum with laminate prosternal process, but tibiae are devoid of spines and female abdominal terminalia is large and elongate, similar to that of *Cis* and *Cis*-like genera [26–27]. All these morphological incongruencies show that probably *Ciini* and *Orophiini* cannot be regarded as monophyletic clades. It shall be noted here, however, that our discussion is limited to the external gross morphology of adults, because few information on immature stages are available in literature and they are insufficient for a broad comparison at this moment, but probably will be helpful to clarify the phylogenetic relationships.

The diagnostic features of *Orophiini*, together with reduced and modified female terminalia, are also observed in the two *Xylographellini* genera *Scolytocis* Blair and *Xylographella* Miyatake, but the whole tribe is well defined and separated from other ciid in several exclusive characteristics, as a flattened compact antennal club with each antennomere bearing more than four sensillifers, mouthparts with ligula conspicuous, labial palpi inserted at the middle of prementum and apical palpomere expanded, and an Y-shaped strut of the ninth-segment (spiculum gastrale) of male abdominal terminalia [28]. Therefore, currently there is no good diagnosis for *Orophiini* and the suprageneric classification of *Ciidae* is far from being satisfactory.

Xylographus has some exclusive characteristics among all known ciids, as the elongate first labial palpomere, males usually bearing an upward tooth at the left mandible, antennomeres of the club with four conspicuous sensillifers symmetrically positioned and formed by a group of short setae arranged in concentric layers, and penis usually with a ventral sclerotized lobe forming a well-developed arch. We have not observed these features in species of any other ciid genera (40 genera examined), except for *Paratrichapus* that has similar antennal club. Moreover, pronotum with dual punctation and females' pronotal punctation usually dissimilar to that of males, are other exclusive characteristics observed in Afrotropical and Afrotropical *Xylographus* but possibly occurring in all *Xylographus*. It is plausible to suppose that *Xylographus* (and possibly *Paratrichapus*) constitutes a separate suprageneric taxon among *Orophiini* or even *Ciinae*.

Afrotropical species of *Xylographus* have the largest body size among described species in the genus, and are amongst the largest, most robust and convex ciids in the world. Morphological external characters more evident in males, as shape of anterior pronotal projection and an upward tooth in the left mandible show a high intraspecific allometric variation. For instance, large-sized males have usually longer tooth than small males. In the other hand, morphology and size of male abdominal terminalia are very stable within a species, but has a high interspecific variation, clearly differentiating one species from another. We have empirically observed that some proportions are stable within species, so that morphometric works will be important to better understand species-limits in the group and be used as additional taxonomic characters to separate closed species.

Ciids have a regular ratio of tegmen and penis size, with penis as long as tegmen or about two-thirds the length of tegmen (pers. obs.). This feature seems to be widespread in the family, except for *Octotemnus rugosopunctatus* Drogvalenko and some species of *Xylographus*, whose penis are half the length of tegmen or less. Among Afrotropical *Xylographus*, we observed five species (*X. anthracinus*, *X. bicolor*, *X. hypocritus*, *Xylographus* **sp. nov.** 01 and *Xylographus* **sp. nov.** 04) showing penis of about two fifths the length of tegmen. This ratio was constant across these species despite the total body length (TL). For instance, the biggest species *X. hypocritus* (TL of 5.35–6.89 mm) showed a longitudinal length of penis of 0.25–0.27 mm, whereas one of the smallest studied species, *X. bicolor* (TL of 2.91–3.56 mm), showed a similar penis size of 0.23–0.25 mm. These results suggest that size of penis is constant among species and is possibly maintained due to sexual selection constraints.

Female abdominal terminalia is mostly membranous and barely developed, with no conspicuous diagnostic features. Spermatheca, a good diagnostic female feature in several groups of Coleoptera, is absent (or reduced and membranous?) in ciids, including *Xylographus*. A female abdominal sex patch (Fig. 40B, arrow) with similar size of the one found in males, is present in the species *Xylographus* **sp. nov.** 03, making females and males difficult to separate without seeing the mandibular tooth. This feature is the first report for *Xylographus* and the second for Ciidae. *Phellinocis romualdoi* Lopes-Andrade & Lawrence has females bearing a setal patch on its first abdominal ventrite with half the diameter of the one found in males [18].

Most of the synonymized *Xylographus* species have been described from a single specimen, without diagnostic features and comparison with ciid fauna from other localities, or was based on a female that lacks relevant morphological characteristic, as the case of *X. longicollis*, *X. eichelbaumi*, *X. rufipennis* and *X. subopacus*. A detailed taxonomic work, based on large series of specimens from different geographical regions and comparative study of male abdominal terminalia is of extreme importance to avoid unnecessary species' descriptions and taxonomic inconsistencies.

4.2. Host-use

The pin label data of the examined Afrotropical and Afrotropical *Xylographus* allowed the recognition of six host fungi: *Ganoderma applanatum* and *Ganoderma australe* (Ganodermataceae), *Trametes hirsuta*, *Hexagonia* sp. and *Polyporus* sp. (Polyporaceae), and *Thelephora* sp. (Thelephoraceae). Three *Xylographus* species were found in *Ganoderma*: *X. anthracinus*, *Xylographus* **sp. nov.** 2 and *X. madagascariensis*. However, the latter species was also collected in *Trametes*, *Polyporus* and *Thelephora* fungi, showing a tendency to polyphagy (sensu Graf-Peters [4]). *X. globipennis* was found in basidiomes of *Hexagonia* sp. Among the fungi recorded as *Xylographus* hosts for the first time are *Trametes hirsuta*, *Hexagonia* sp., *Polyporus* sp., and *Thelephora* sp.

The large body size of *Xylographus*, and the great amount of specimens which breed inside a single basidiome, allow them the consumption of large amounts of fungic matter, especially those of large-sized basidiomes as *Ganoderma* species. Indeed, *Ganoderma* species have been recorded as host fungi of *Xylographus* in the Afrotropical, Palearctic and Neotropical regions [3, 29–30], including *Ganoderma applanatum* [31] and *Ganoderma australe* [4, 14, 32]. Others known host fungi are *Fomes* sp. [30] and *Fomes fomentarius* (Polyporaceae) [31, 33] from the Palearctic region and the genus *Phellinus*, including its species *Phellinus apiahynus*, *Phellinus fastuosus*, *Phellinus gilvus* and *Phellinus grenadensis* (Hymenochaetaceae) from the Neotropical region [4].

Sometimes, ciids are found outside a fungus body or in an unusual host. *Orthocis elguetai* Lopes-Andrade was found on *Aextoxicon punctatum*, a large

evergreen tree endemic to the temperate and subpolar forests in Chile [34]; *Nipponapterocis brevis* Miyatake was extracted from litter by using a Berlese funnel [35]; *Atlantocis* Israelson was already found under the bark of trees and also among debris on the ground [36]; *Cis chinensis* has been found breeding in commercial dried mushrooms and non-fungi products as tofu [37]. Some specimens of the Afrotropical *X. subopacus* were reported on fruits of *Allanblackia floribunda* Oliv. (Malpighiales: Clusiaceae), a common evergreen understory tree in rainforest of western Central Africa. Also, this species was found on the African oil palm *Elaeis guineensis* Jacq. 1897 (Arecales: Arecaceae), native to west and southwest Africa and on *Albizia* sp. (Fabales: Fabaceae), a genus of fast-growing subtropical and tropical trees. Despite of the large series of specimens, it is still not clear whether *X. subopacus* always breeds outside fungus or are sometimes collected while dispersing between basidiomes.

4.3. Geographic distribution

Xylographus is widely distributed in the Afrotropical and Afrotemperate continental regions, from Chad and Mali at the north, to Ivory Coast at west, Eritrea at northeast, Mozambique on southeast, and South Africa on the austral limit (Fig. 49). It is also found on the islands of São Tomé in the Atlantic Ocean, and on the biggest islands in the Indian Ocean, including Madagascar, Seychelles and Reunion.

The most species-rich subregion for Afrotropical *Xylographus* is the African Equatorial Forests, a belt of lowland tropical moist broadleaf forests, extending along the coast from West Africa (Guinea – Upper Guinean forests) to Central Africa (Democratic Republic of the Congo – Congolian forests), with eight described species: *X. nitidissimus*, *X. subopacus*, *Xylographus* **sp. nov.** 2, *Xylographus* **sp. nov.** 3, *Xylographus* **sp. nov.** 4, *Xylographus* **sp. nov.** 5, *Xylographus* **sp. nov.** 6 and *Xylographus* **sp. nov.** 7 (Figs 51, 53). An additional high diversity subregion comprises Madagascar to the Seychelles Islands, with seven species described from its tropical forests, of which four are endemic for Madagascar (*X. anthracinus*, *X. bicolor*, *X. hypocritus* and *Xylographus* **sp. nov.** 1) and one (*X. subsinuatus*) is restricted to both archipelagos (Figs 50, 52).

Madagascar and the Seychelles were part of the ancient supercontinent of Gondwana, separated from Africa in the low Cretaceous (140 m.y.a. – millions years ago), but remained attached to India until its division about 90 m.y.a. [38]. This long period of isolation explains their high degree of endemic taxa and also corresponds to the distributional pattern observed for *Xylographus* endemic species.

The Afromontane subregion, from the Ethiopian Highlands to the Drakensberg Mountains in Southern Africa, has only two but broadly distributed species of *Xylographus*: *X. globipennis* and *X. madagascariensis* (Fig 51). These species show a broad distribution in Africa with the northern (*X. globipennis* in Eritrea) and southernmost localities (*X. madagascariensis* in South Africa) and reach the highest altitudes (1500 meter above sea level).

The Afrotropical region has a low diversity of *Xylographus* with only one species, *X. madagascariensis*, which is widely distributed in the Subtropical Oriental Africa, reaching its most austral limit in the Cape of South Africa. Part of the available material from South Africa was the result of intense collection efforts between 2002 and 2010, as part of a study on *Astichus* Förster (Hymenoptera: Eulophidae), parasitoids of Ciidae [39]. Besides the great amount of collected ciids in the Afrotropical region, several thousands of individuals, the number of *Xylographus* was negligible compared with other ciid genera. The occurrence of *Xylographus* in the Afrotropical region may be incidental, so we can suppose that *Xylographus* species of the African continent have a typical tropical distribution.

Considering the taxonomic acts of the present work, *Xylographus* has 16 species distributed on Afrotropical and Afrotropical regions, of which nine were previously described and include seven synonymies proposed here, and seven are new to science, leading to a total of 35 described *Xylographus* species in the world. The study of other biogeographical regions is very important to confirm the validity of the other names and extend the records of their geographical distribution.

Disclosure of interest

The authors declare that they have no conflicts of interest concerning this article.

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Plates

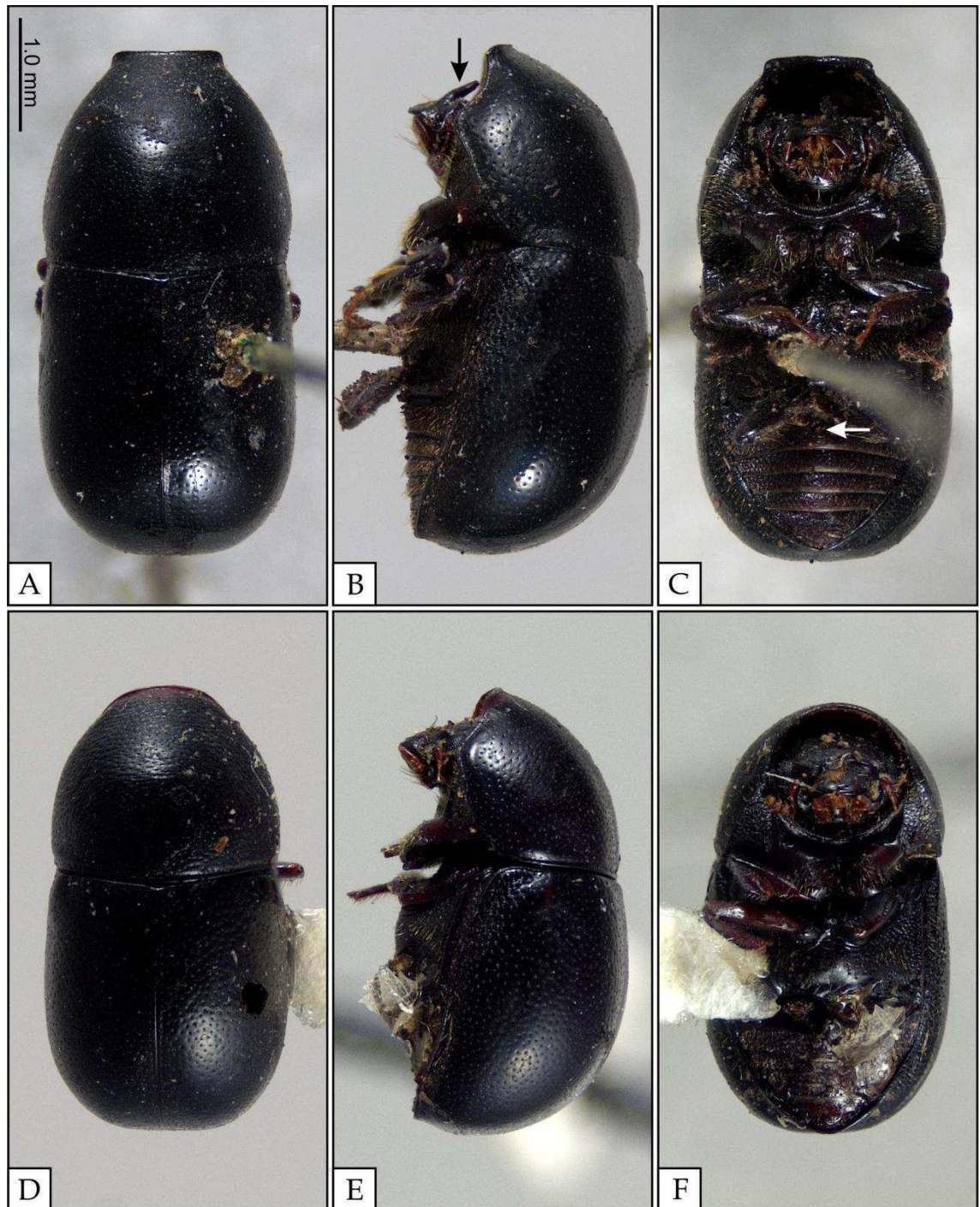


Fig. 1. Habitus of *Xylographus anthracinus* Mellié, 1849. Lectotype male (A–C). A. Dorsal view. B. Lateral view, showing the tooth in the left mandible (arrow). C. Ventral view, showing the setose sex patch (arrow). Paralectotype female (D–F). D. Dorsal view. E. Lateral view. F. Ventral view. Both specimens from Madagascar (MNHN). All figures in the same scale.

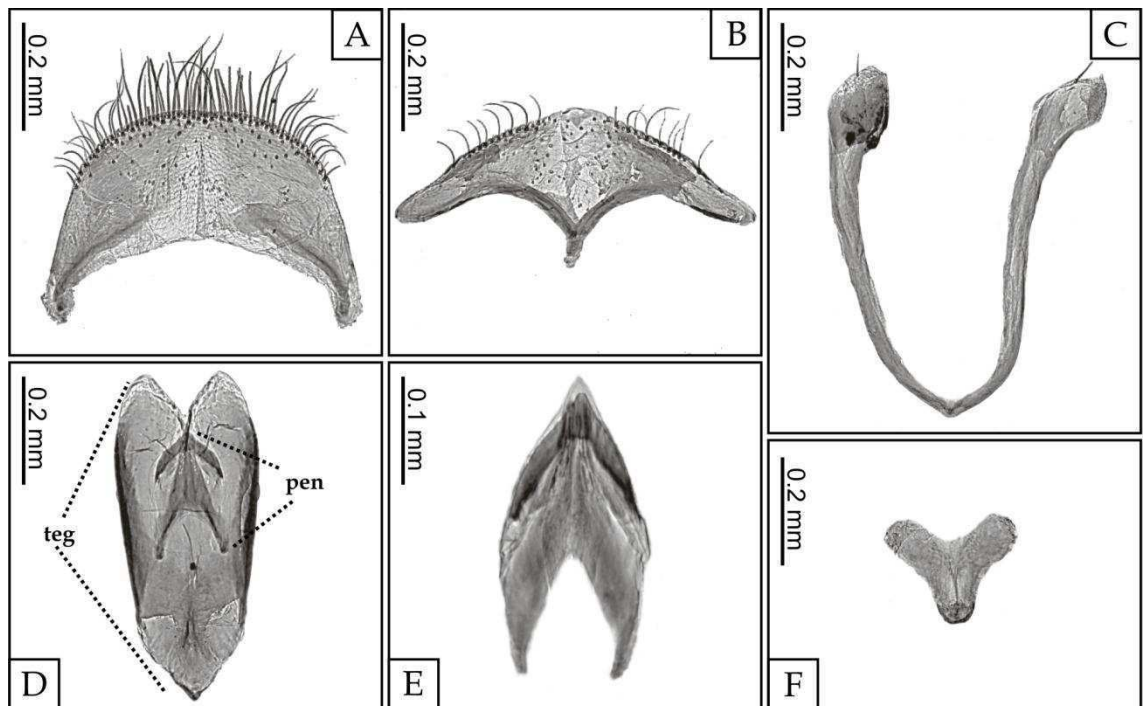


Fig. 2. Paralectotype male terminalia of *Xylographus anthracinus* Mellié, 1849 from Madagascar (MHNG). A. Eighth tergite. B. Eighth sternite. C. Ninth segment. D. Aedeagus. E. Penis (MNHN). F. Basal piece. Abbreviations: teg, tegmen; pen, penis.

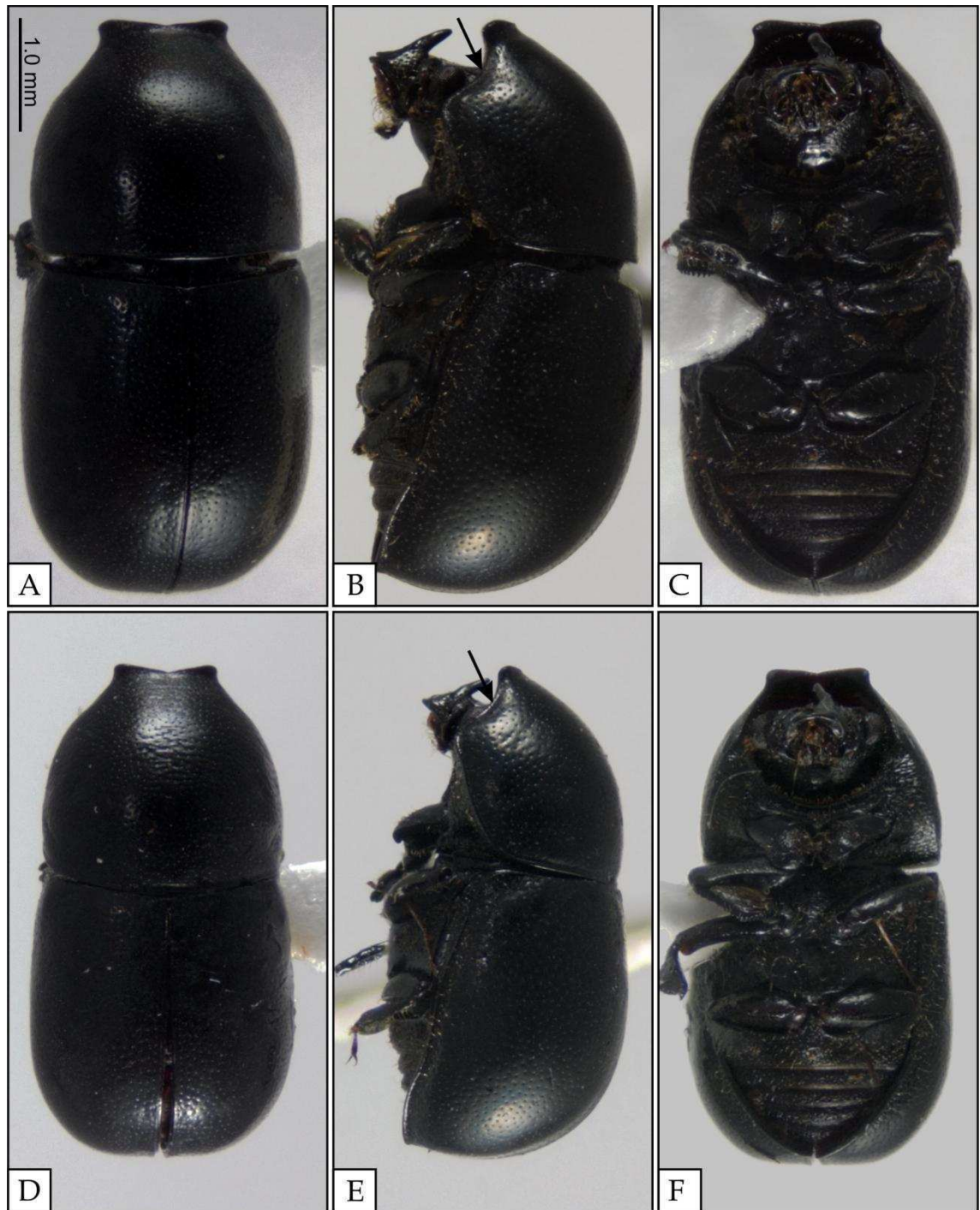


Fig. 3. Habitus of *Xylographus anthracinus* Mellié, 1849. Large-sized male (A–C). A. Dorsal view. B. Lateral view, showing the arched lateral margin of the anterior projection of pronotum (arrow). C. Ventral view. Median-sized male (D–F). D. Dorsal view. E. Lateral view, showing the arched lateral margin of the anterior projection of pronotum (arrow). F. Ventral view. Both specimens from Madagascar (MNHN). All figures in the same scale.

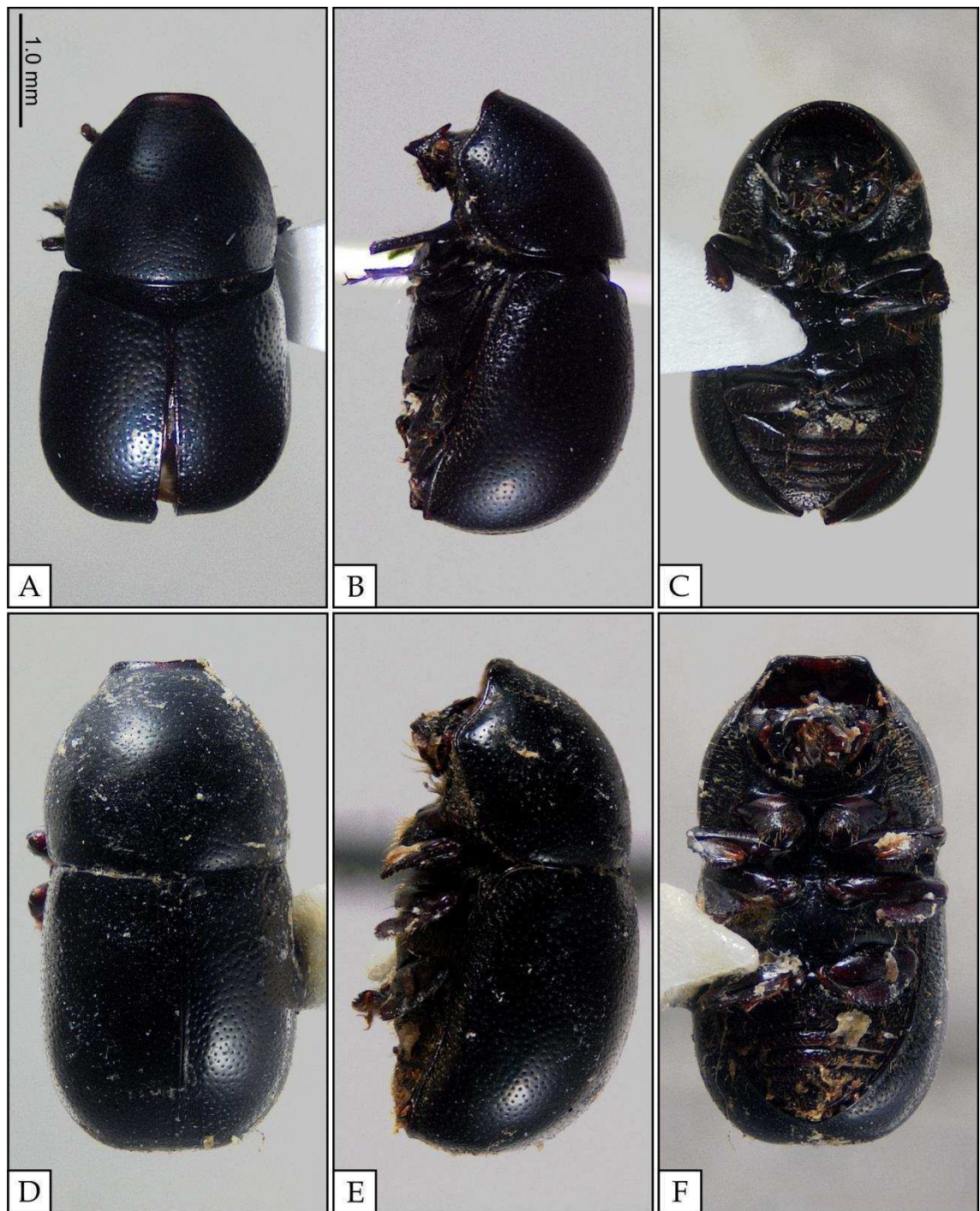


Fig. 4. Habitus of *Xylographus anthracinus* Mellié, 1849. Small-sized male (A–C) from collection A. Sicard 1930 (MNHN). A. Dorsal view. B. Lateral view. C. Ventral view. Lectotype male (D–F) of *Xylographus testaceitarsis* Pic, 1916. All figures in the same scale.

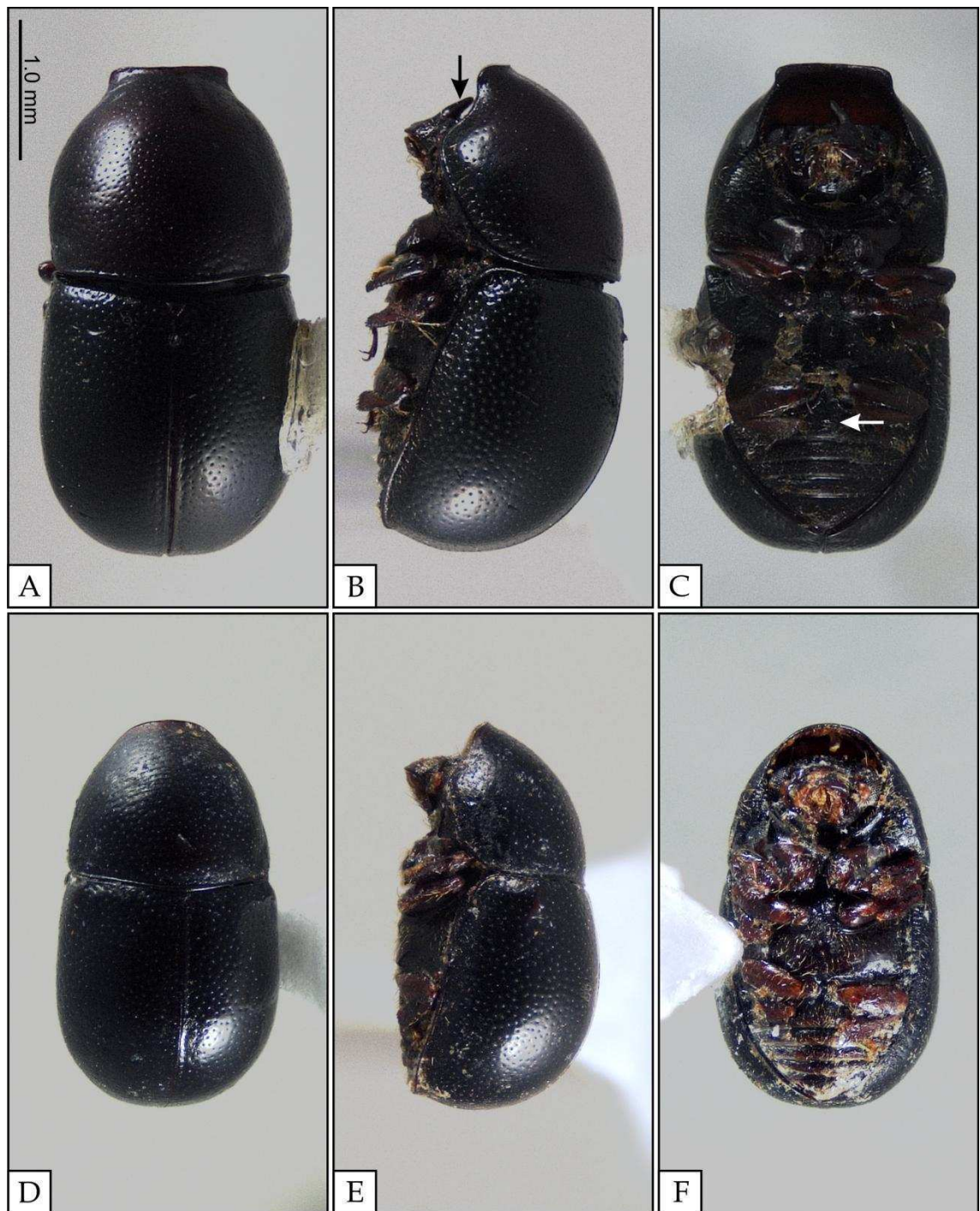


Fig. 5. Habitus of *Xylographus bicolor* Pic, 1916. Lectotype male (A–C) from Madagascar, Mahatsinjo (MNHN). A. Dorsal view. B. Lateral view, showing the tooth in the left mandible (arrow). C. Ventral view, showing the setose sex patch (arrow). Female (D–F) from Madagascar (MNHN). D. Dorsal view. E. Lateral view. F. Ventral view. All figures in the same scale.

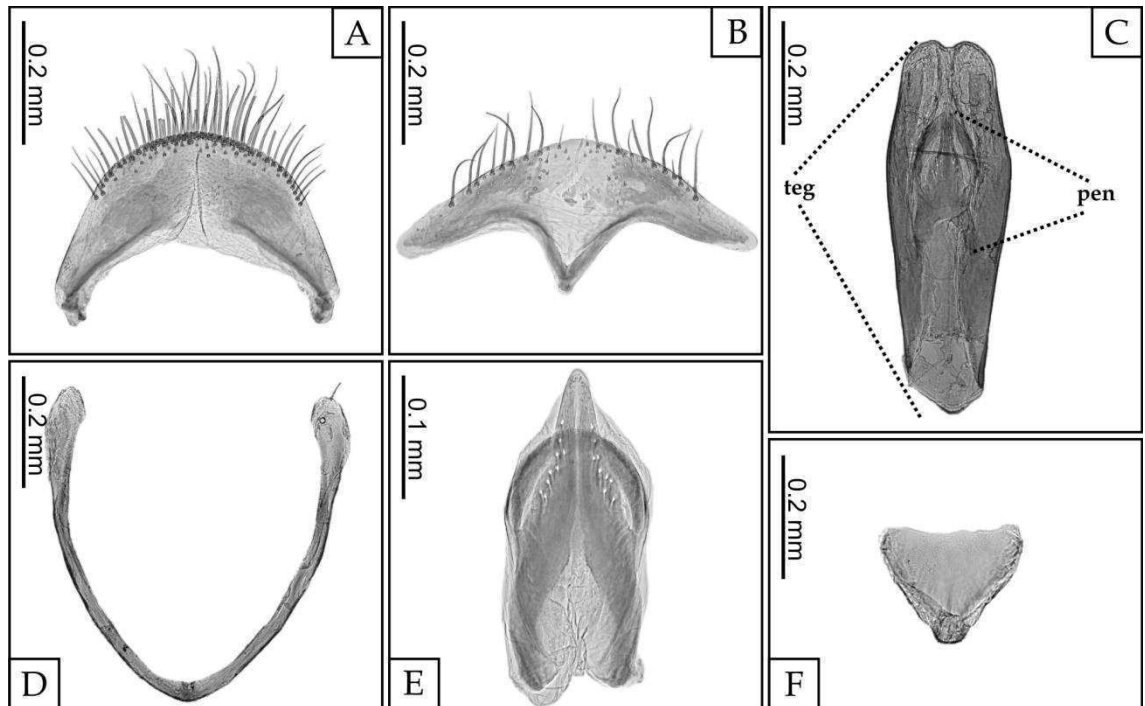


Fig. 6. Lectotype male terminalia of *Xylographus bicolor* Pic, 1916 from Madagascar, Mahatsinjo (MNHN) (C, D, F). Male terminalia from Madagascar, Ranomafana env. (MHNG) (A, B, E) A. Eighth tergite. B. Eight sternite. C. Aedeagus. D. Ninth segment. E. Penis. F. Basal piece. Abbreviations: teg, tegmen; pen, penis.



Fig. 7. Habitus of *Xylographus bicolor* Pic, 1916. Medium-sized male (A–C) from Madagascar, Diego Suarez (MNHN). A. Dorsal view. B. Lateral view. C. Ventral view. Small-sized male (D–F) from Madagascar, Ranomafana env. (MHNG). D. Dorsal view. E. Lateral view. F. Ventral view. All figures in the same scale.

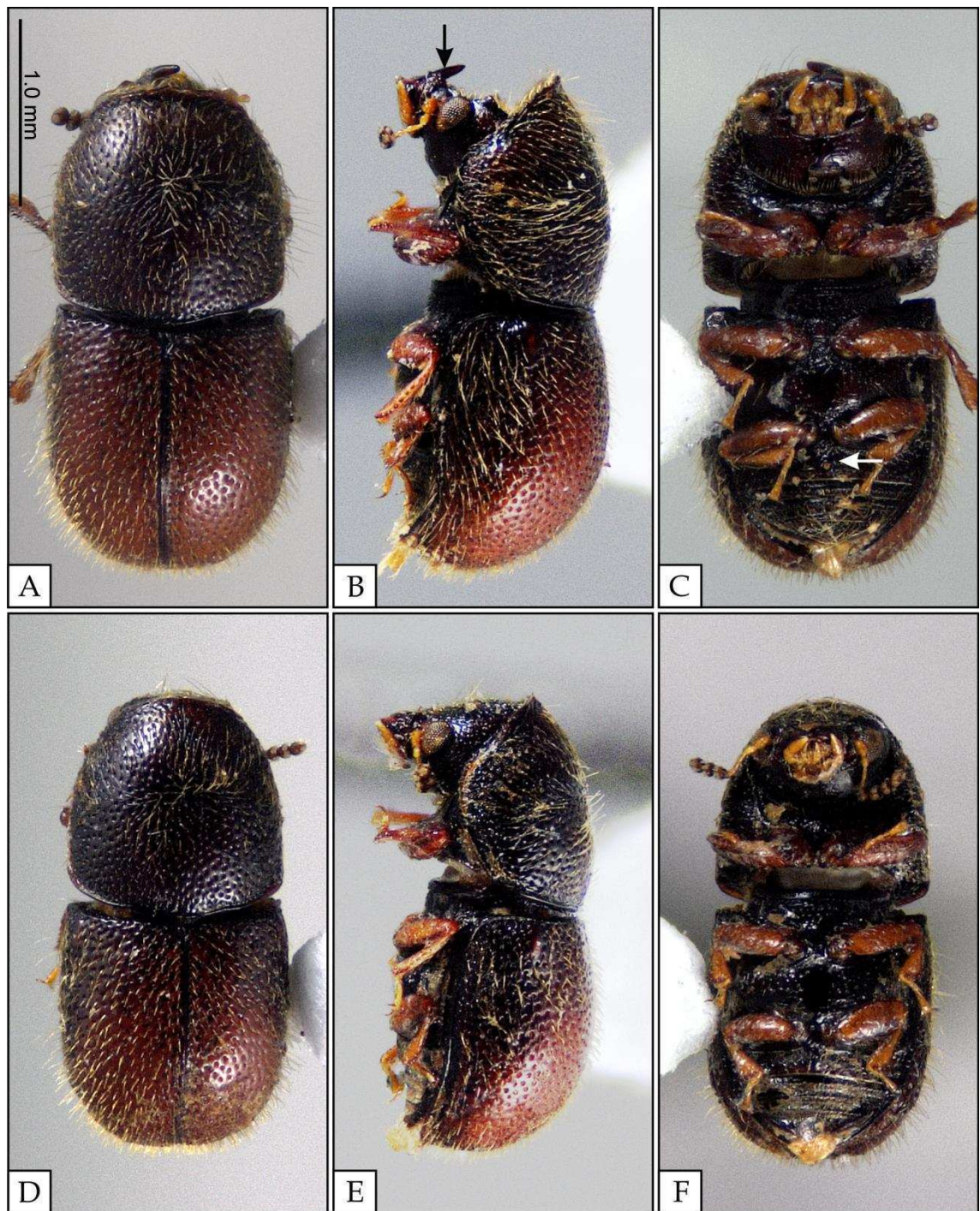


Fig. 8. Habitus of *Xylographus globipennis* Reitter, 1911. Lectotype male (A–C). A. Dorsal view. B. Lateral view, showing the tooth in the left mandible (arrow). C. Ventral view, showing the setose sex patch (arrow). Paralectotype female (D–F). D. Dorsal view. E. Lateral view. F. Ventral view. Both specimens from Eritrea, Gorbatuco (HNHM). All figures in the same scale.

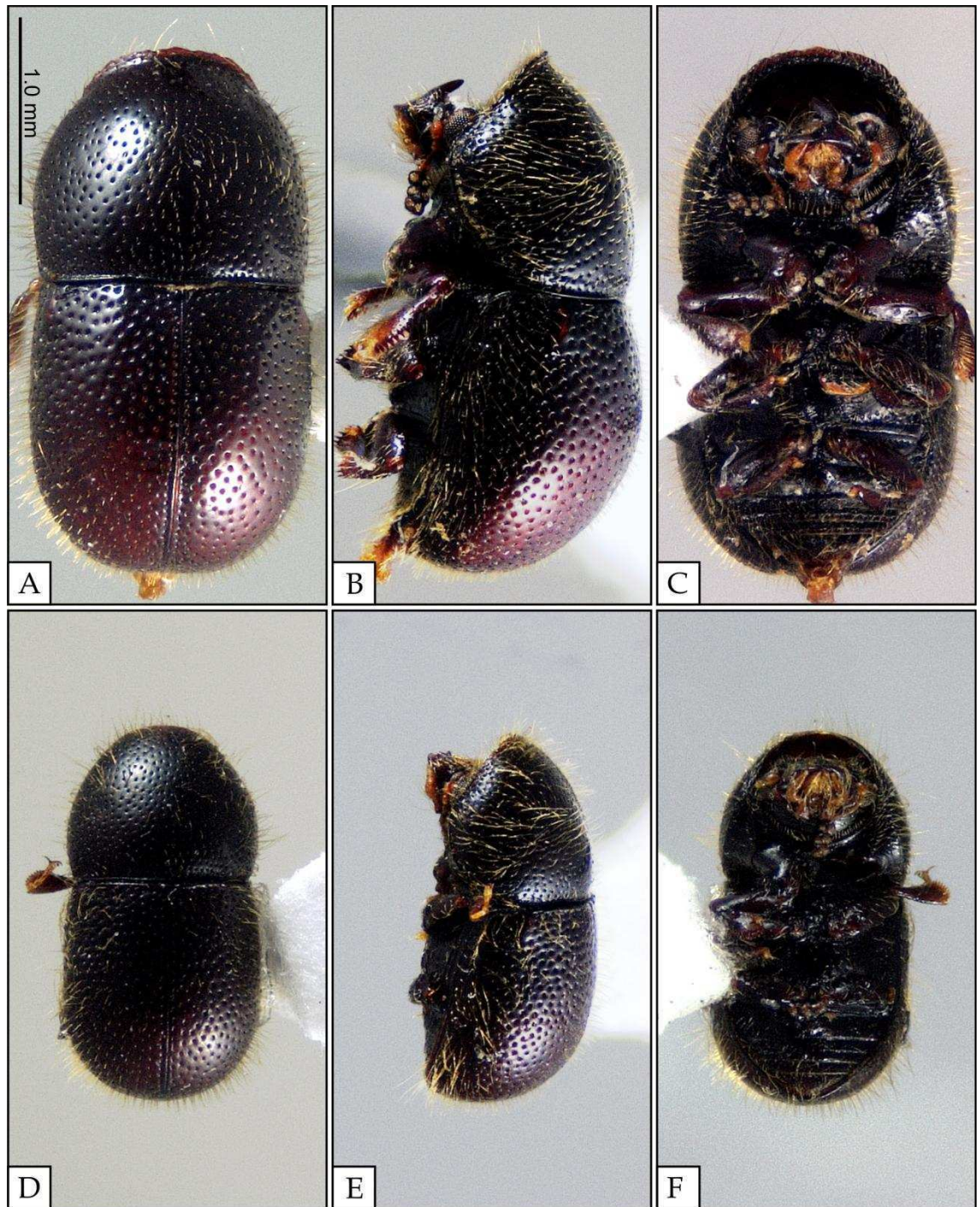


Fig. 9. Habitus of *Xylographus globipennis* Reitter, 1911. Large-sized male (A–C) from Mozambique, Env. Vila Pery (MNHN). A. Dorsal view. B. Lateral view. C. Ventral view. Small-sized male (D–F) from Mozambique, Tambara (MNHN). D. Dorsal view. E. Lateral view. F. Ventral view. All figures in the same scale.

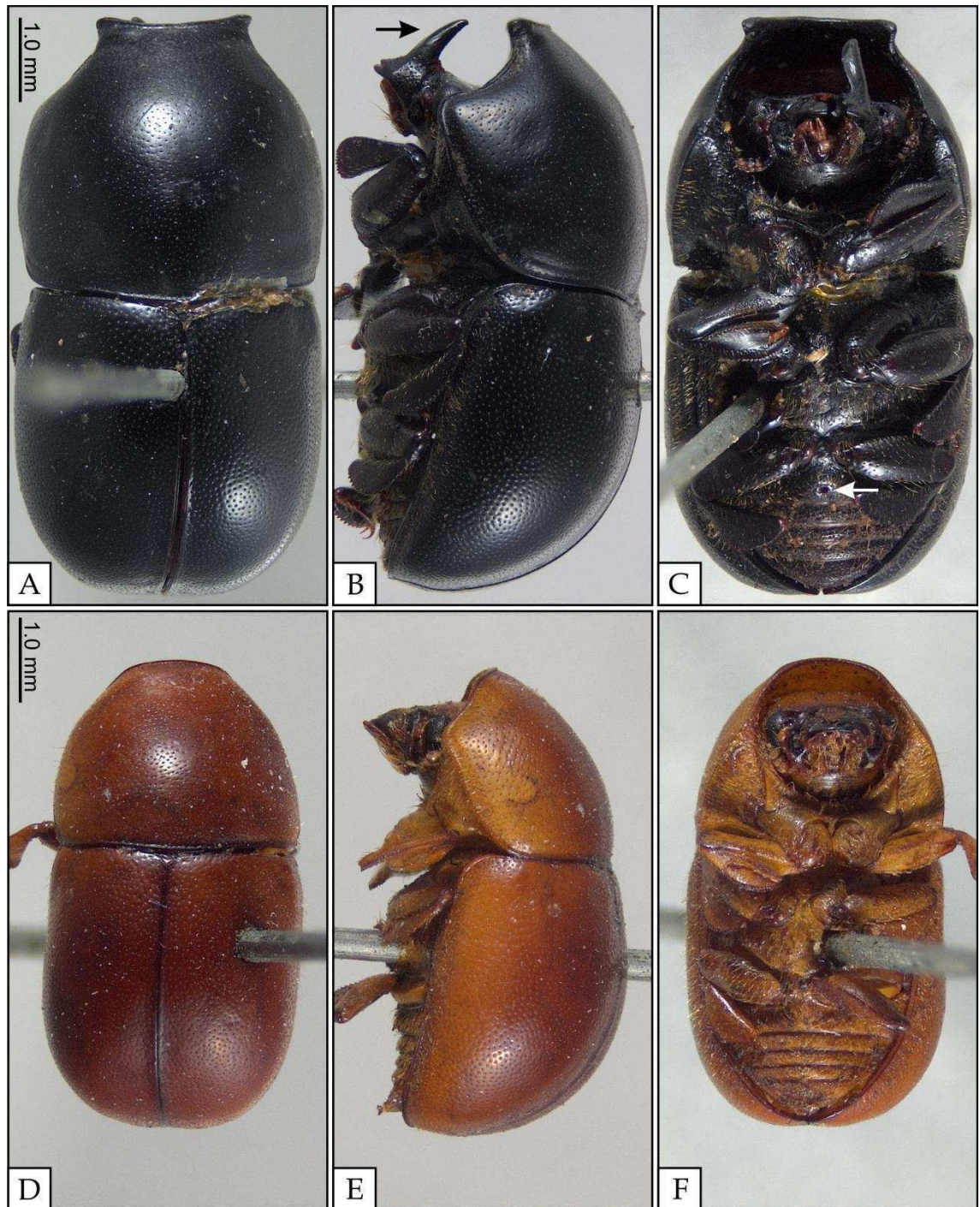


Fig. 10. Habitus of *Xylographus hypocritus* Mellié, 1849. Lectotype male (A–C, same scale). A. Dorsal view. B. Lateral view, showing the tooth in the left mandible (arrow). C. Ventral view, showing the setose sex patch (arrow). Paralectotype female (D–F, same scale). D. Dorsal view. E. Lateral view. F. Ventral view. Both specimens from Madagascar (MNHN).

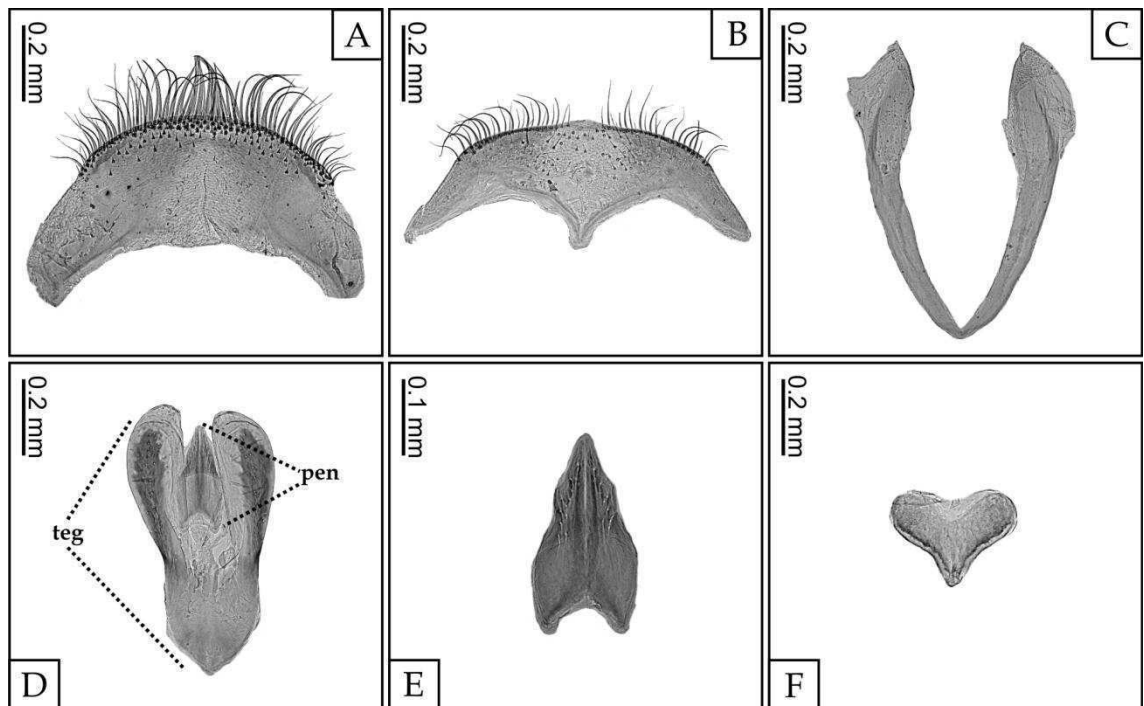


Fig. 11. Male terminalia of *Xylographus hypocritus* Mellié, 1849 from Madagascar, Fianarantsoa (MHNG). A. Eighth tergite. B. Eight sternite. C. Ninth segment. D. Aedeagus. E. Penis, from Madagascar, Tamatave (MNHN). F. Basal piece. Abbreviations: teg, tegmen; pen, penis.

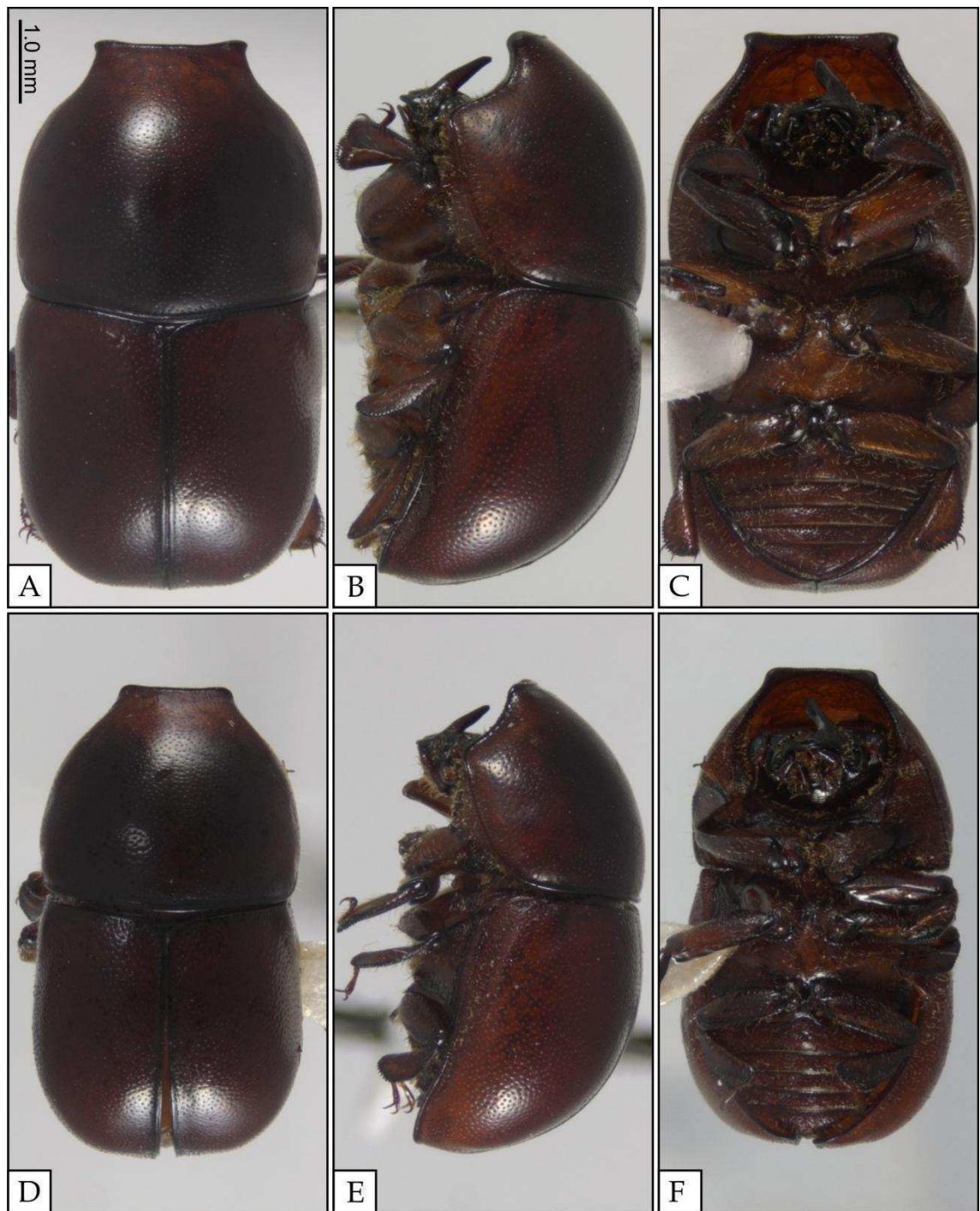


Fig. 12. Habitus of *Xylographus hypocritus* Mellié, 1849. Large-sized male (A–C). A. Dorsal view. B. Lateral view. C. Ventral view. Small-sized male (D–F). D. Dorsal view. E. Lateral view. F. Ventral view. Both specimens from Madagascar, Fianarantsoa (MHNG). All figures in the same scale.

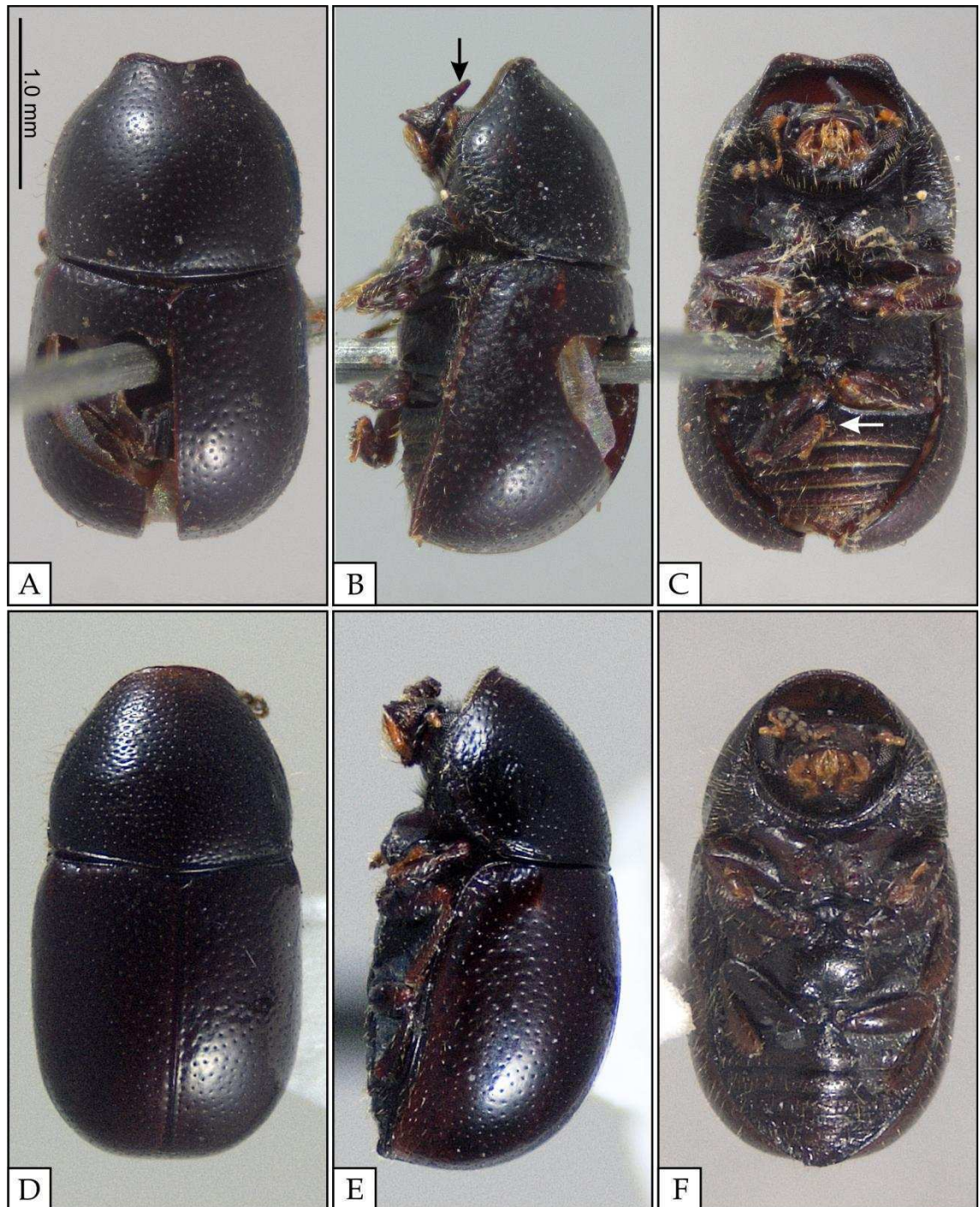


Fig. 13. Habitus of *Xylographus madagascariensis* Mellié, 1849. Lectotype male (A–C) from Madagascar (MNHN). A. Dorsal view. B. Lateral view, showing the tooth in the left mandible (arrow). C. Ventral view, showing the setose sex patch (arrow). Female (D–F) from South Africa, Zululand (MRAC). D. Dorsal view. E. Lateral view. F. Ventral view. All figures in the same scale.

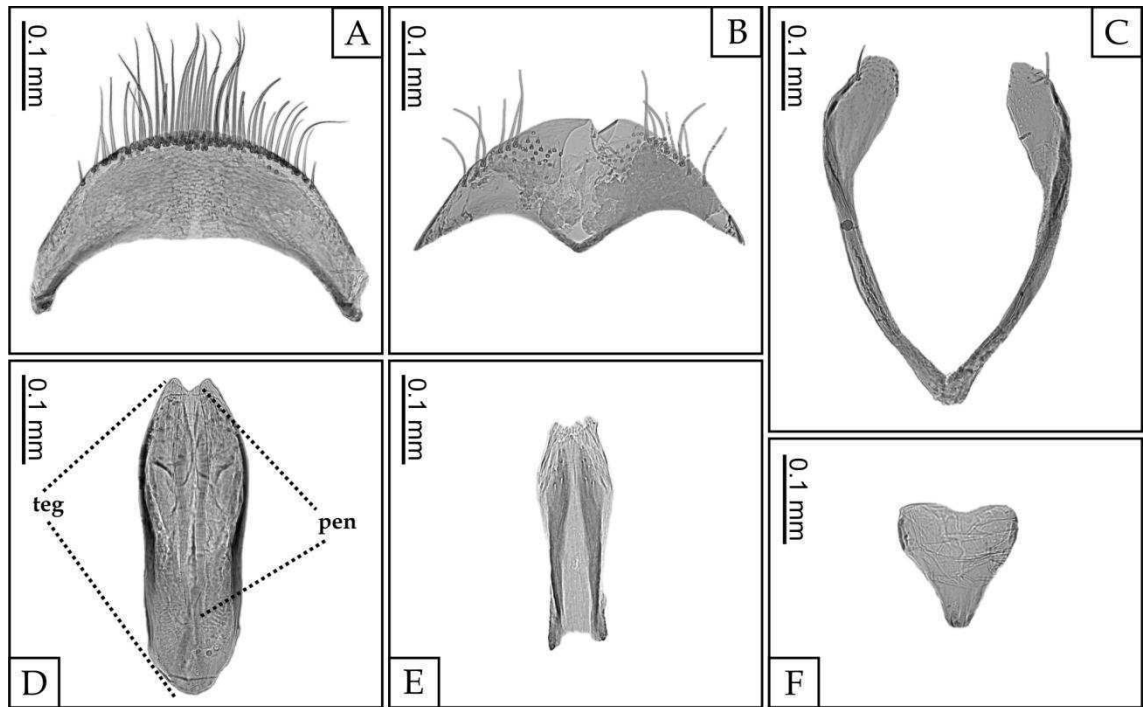


Fig. 14. Lectotype male terminalia of *Xylographus madagascariensis* Mellié, 1849 from Madagascar (MNHN) (C, D, F). Male terminalia from Democratic Republic of the Congo, Kundelungu (MRAC) (A, B). A. Eighth tergite. B. Eighth sternite. C. Ninth segment. D. Aedeagus. E. Penis, from Uganda, Bugiri (MRAC). F. Basal piece. Abbreviations: teg, tegmen; pen, penis.

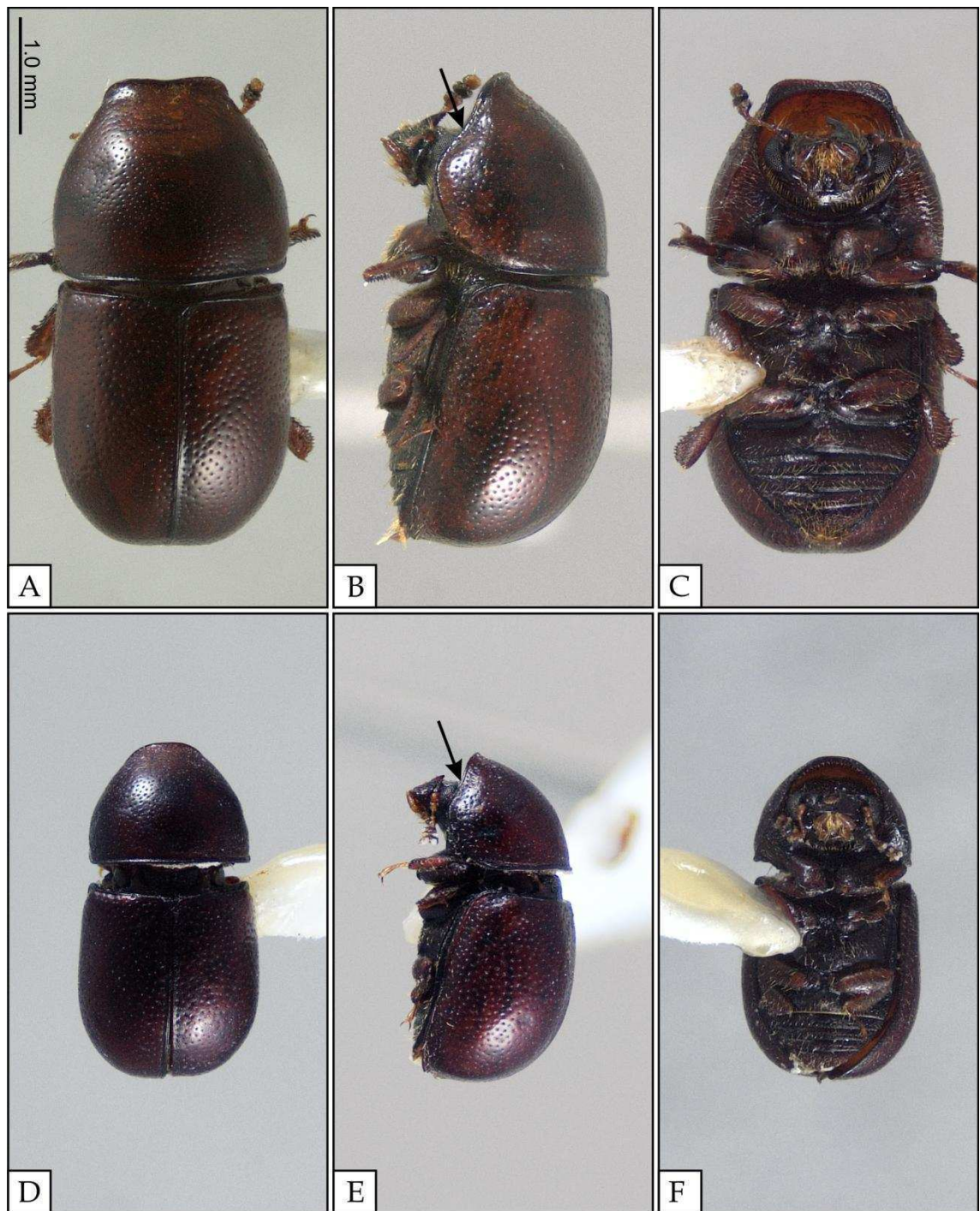


Fig. 15. Habitus of *Xylographus madagascariensis* Mellié, 1849. Large-sized male (A–C) f. A. Dorsal view. B. Lateral view, showing the sinuous lateral margin of the anterior projection of pronotum (arrow). C. Ventral view. Small-sized male (D–F). D. Dorsal view. E. Lateral view, showing the sinuous lateral margin of the anterior projection of pronotum (arrow). F. Ventral view. Both specimens from South Africa, Montagu Pass (SANC). All figures in the same scale.

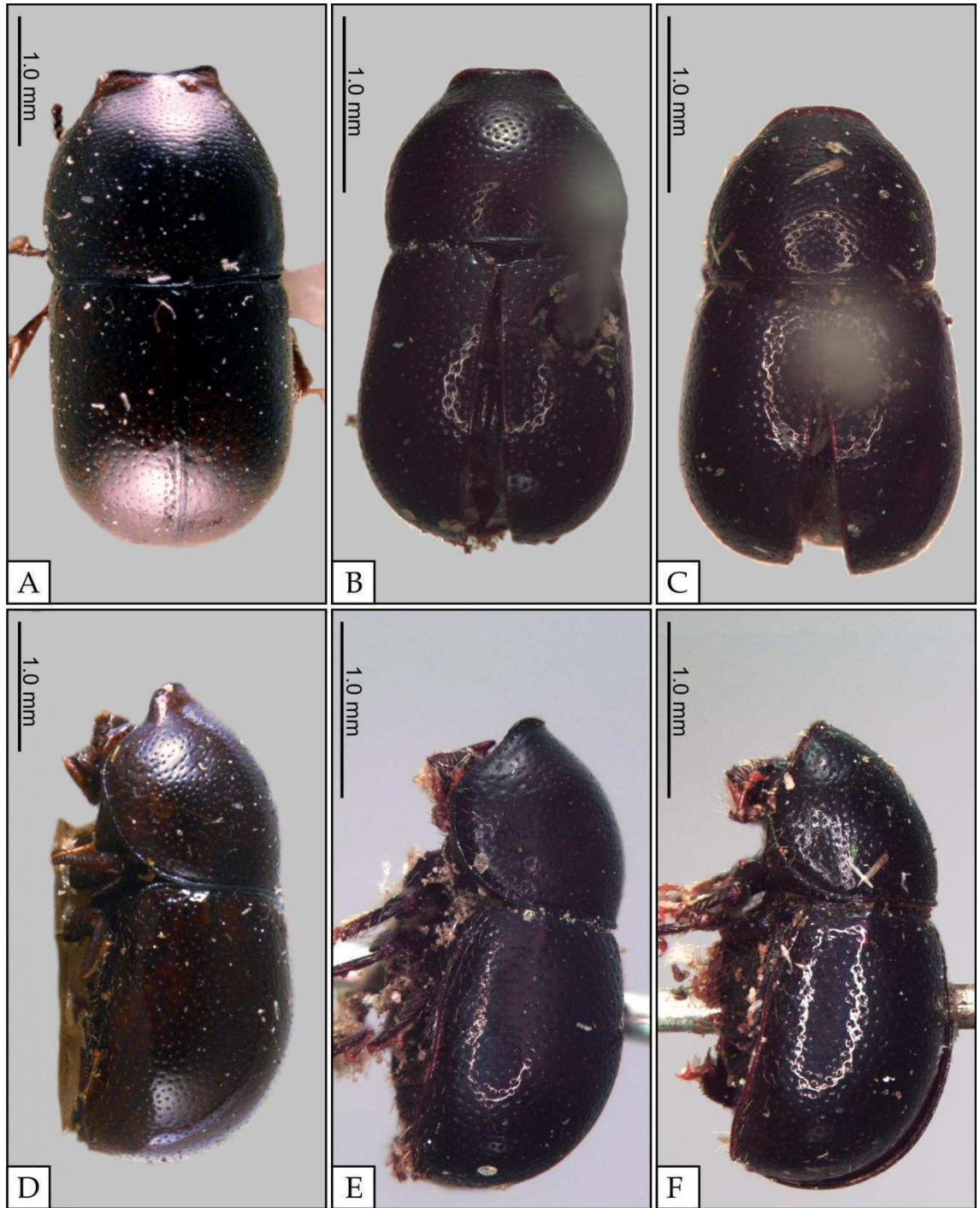


Fig. 16. Habitus of *Xylographus madagascariensis* Mellié, 1849. Lectotype male (A, D) of *Xylographus seychellensis* Scott, 1926, from Seychelles, Mahe (BMNH). Lectotype male (B, E) and paralectotype female (C, F) of *Xylographus tarsalis* Fahreus, 1871, from South Africa, Caffraria (NHRS). A–C. Dorsal view. D–F. Lateral view.

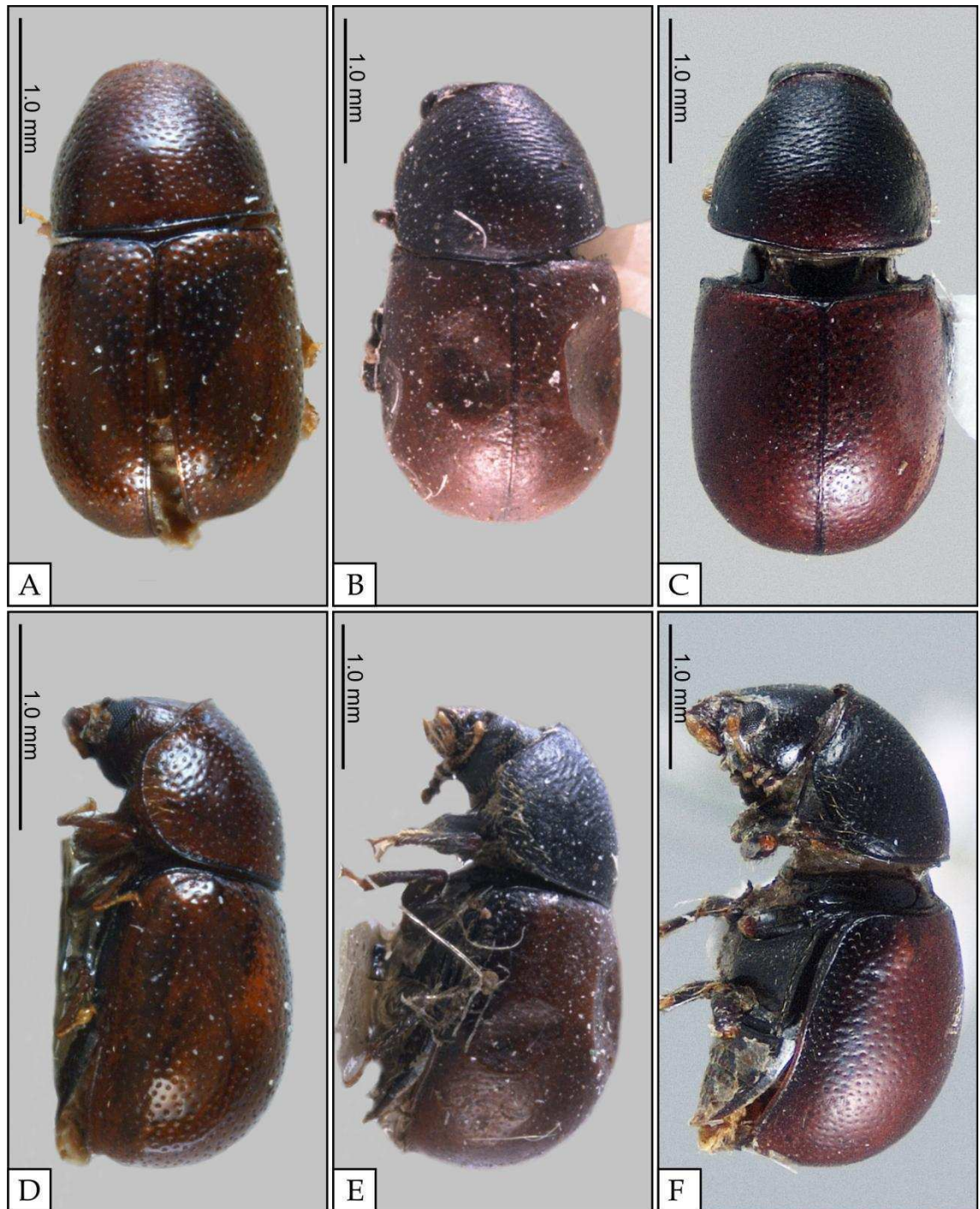


Fig. 17. Habitus of *Xylographus madagascariensis* Mellié, 1849. Lectotype female (A, D) of *Xylographus eichelbaumi* Scott, 1926, from Tanzania, Zanzibar, Amani (NMW). Lectotype female (B, E) and paralectotype female (C, F) of *Xylographus rufipennis* Pic, 1934, from Kenya, Gura (BMNH–MNHN). A–C. Dorsal view. D–F. Lateral view.

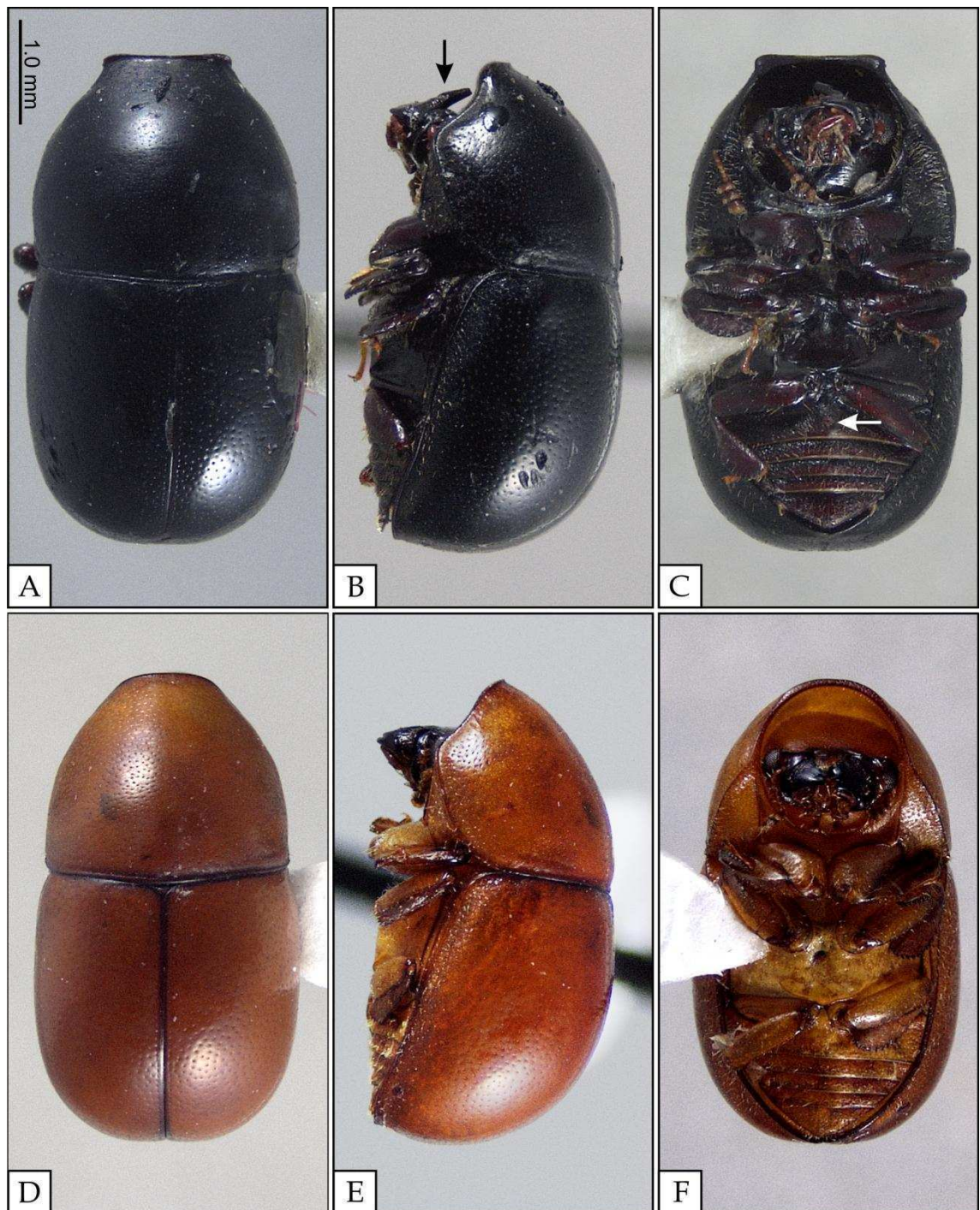


Fig. 18. Habitus of *Xylographus nitidissimus* Pic, 1916. Lectotype male (A–C). A. Dorsal view. B. Lateral view, showing the tooth in the left mandible (arrow). C. Ventral view, showing the setose sex patch (arrow). Female (D–F). D. Dorsal view. E. Lateral view. F. Ventral view. Both specimens from San Thomé (MNHN). All figures in the same scale.

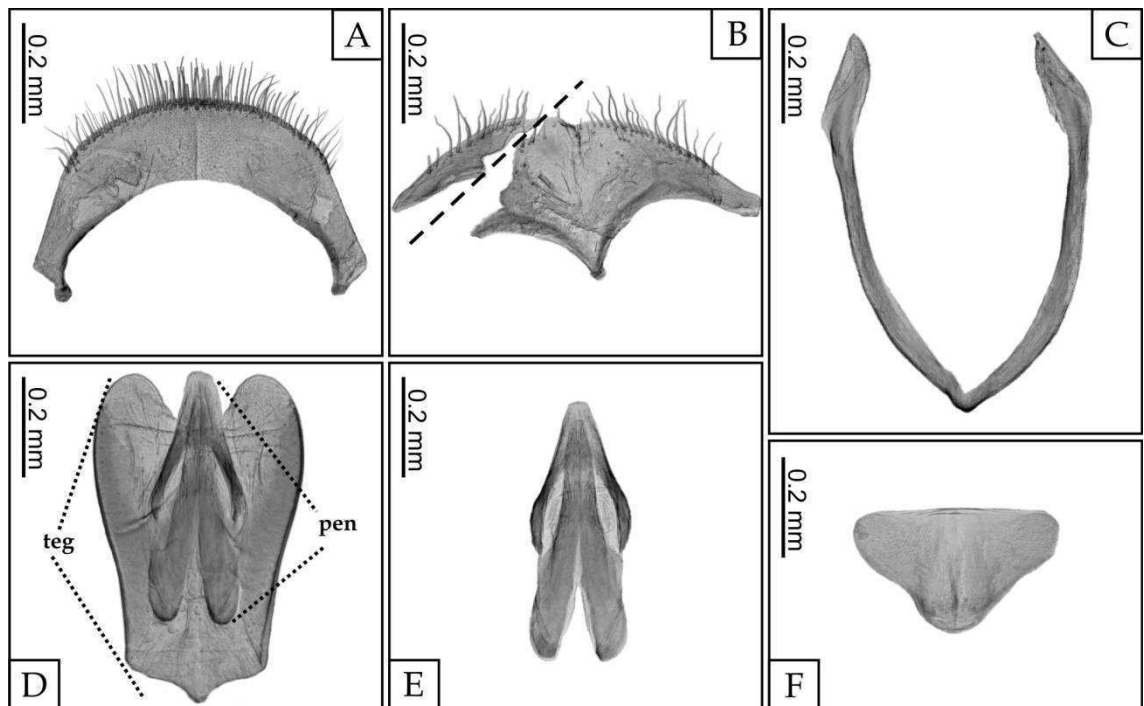


Fig. 19. Male terminalia of *Xylographus nitidissimus* Pic, 1916 from San Thomé (MNHN). A. Eighth tergite. B. Eighth sternite, broken (dashed line). C. Ninth segment. D. Aedeagus. E. Penis. F. Basal piece. Abbreviations: teg, tegmen; pen, penis.

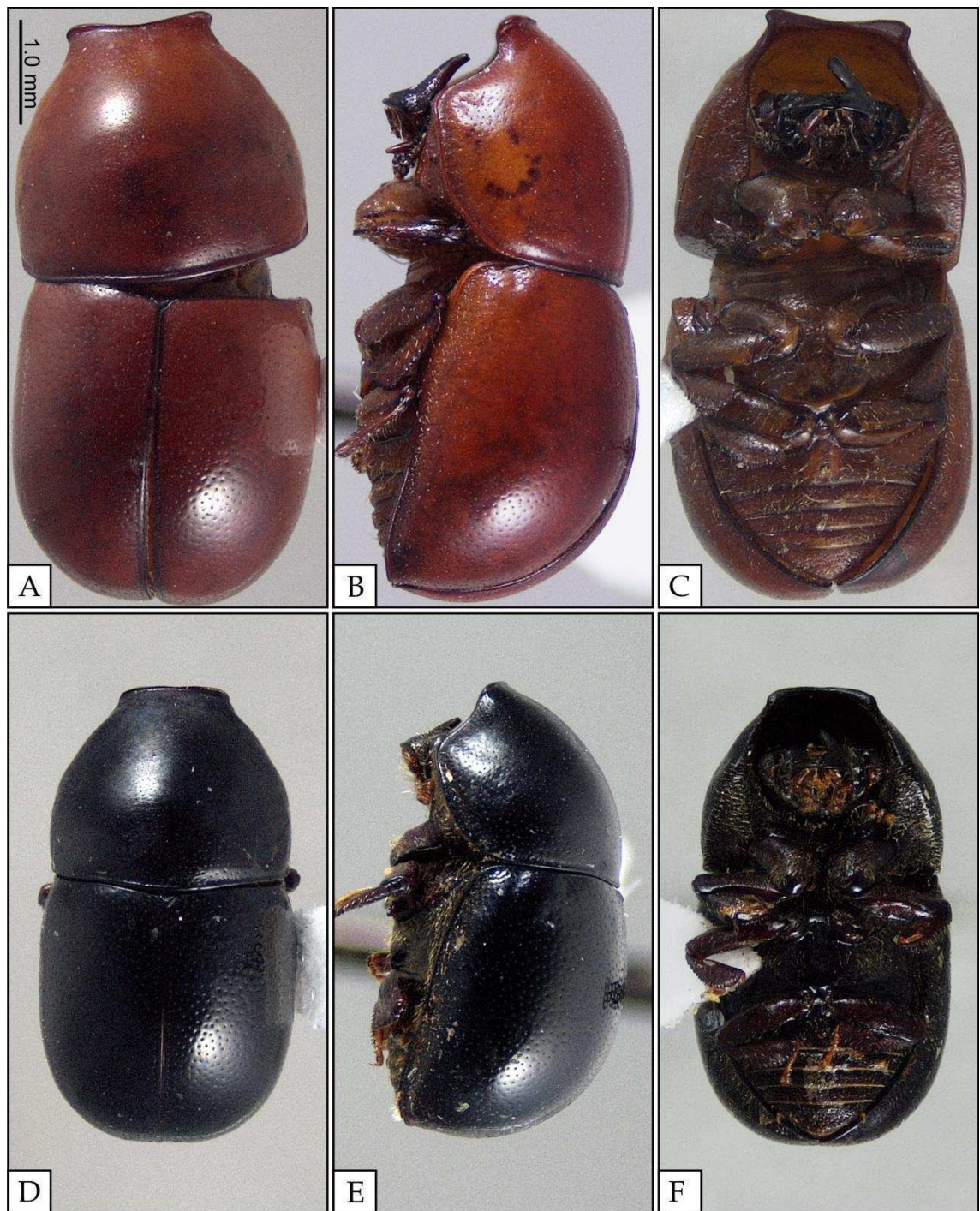


Fig. 20. Habitus of *Xylographus nitidissimus* Pic, 1916. Large-sized male (A–C). A. Dorsal view. B. Lateral view. C. Ventral view. Small-sized male (D–F). D. Dorsal view. E. Lateral view. F. Ventral view. Both specimens from San Thomé (MNHN). All figures in the same scale.

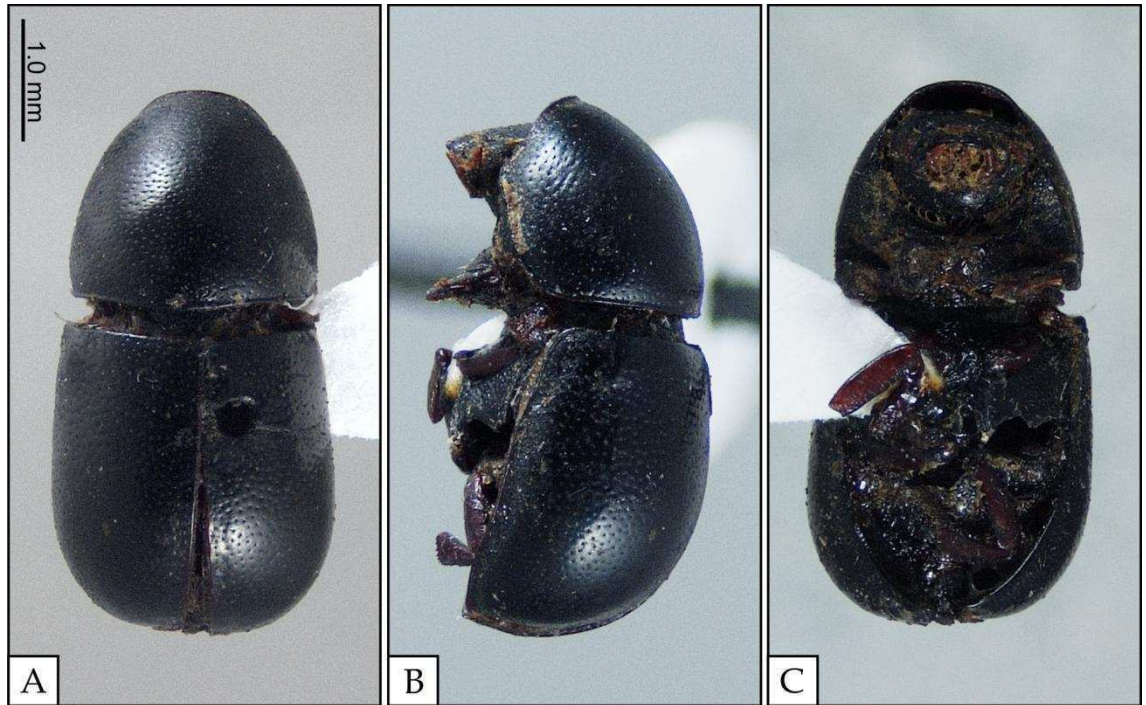


Fig. 21. Habitus of *Xylographus nitidissimus* Pic, 1916. Lectotype female (A–C) of *Xylographus longicollis* Pic, 1922, from Benin, Dahomey (MNHN). All figures in the same scale.

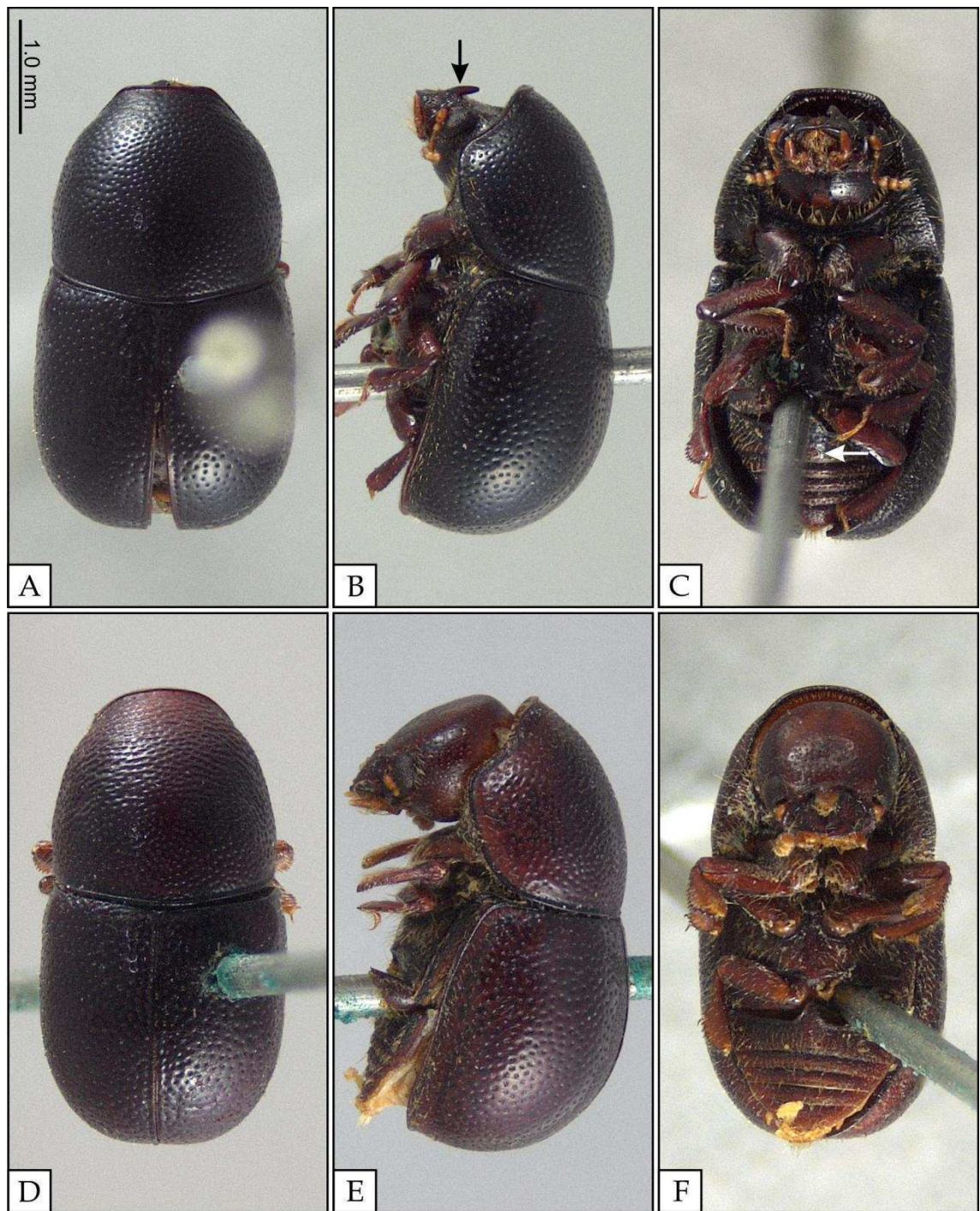


Fig. 22. Habitus of *Xylographus perforatus* Gerstaecker, 1871. Lectotype male (A–C). A. Dorsal view. B. Lateral view, showing the tooth in the left mandible (arrow). C. Ventral view, showing the setose sex patch (arrow). Paralectotype female (D–F). D. Dorsal view. E. Lateral view. F. Ventral view. Both specimens from Tanzania, Sansibar (MFNB–MNHN). All figures in the same scale.

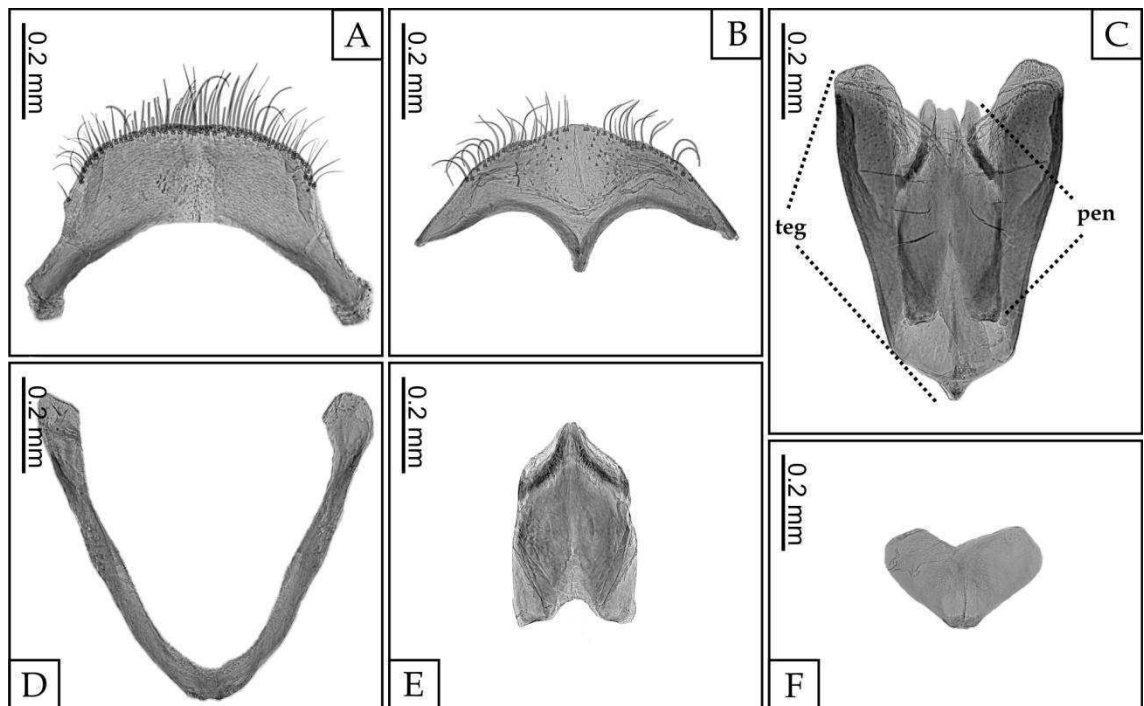


Fig. 23. Male terminalia of *Xylographus perforatus* Gerstaecker, 1871 from Tanzania, Mts Uluguru (MRAC). A. Eighth tergite. B. Eighth sternite. C. Aedeagus. D. Ninth segment. E. Penis. F. Basal piece. Abbreviations: teg, tegmen; pen, penis.

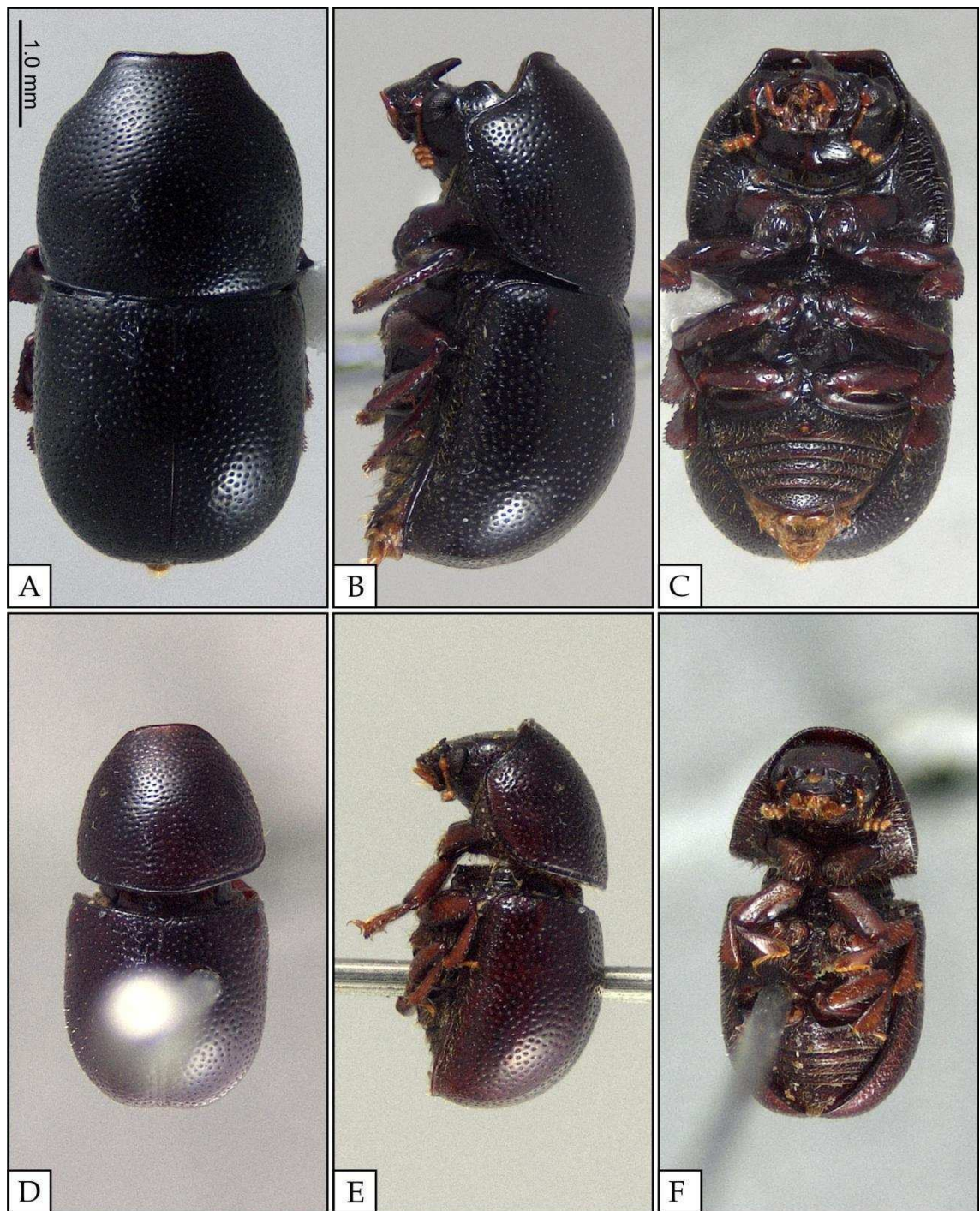


Fig. 24. Habitus of *Xylographus perforatus* Gerstaecker, 1871. Large-sized male (A–C) from Tanzania, Mts Uluguru (MRAC). A. Dorsal view. B. Lateral view. C. Ventral view. Small-sized male (D–F) from Tanzania, Sansibar (MFNB). D. Dorsal view. E. Lateral view. F. Ventral view. All figures in the same scale.

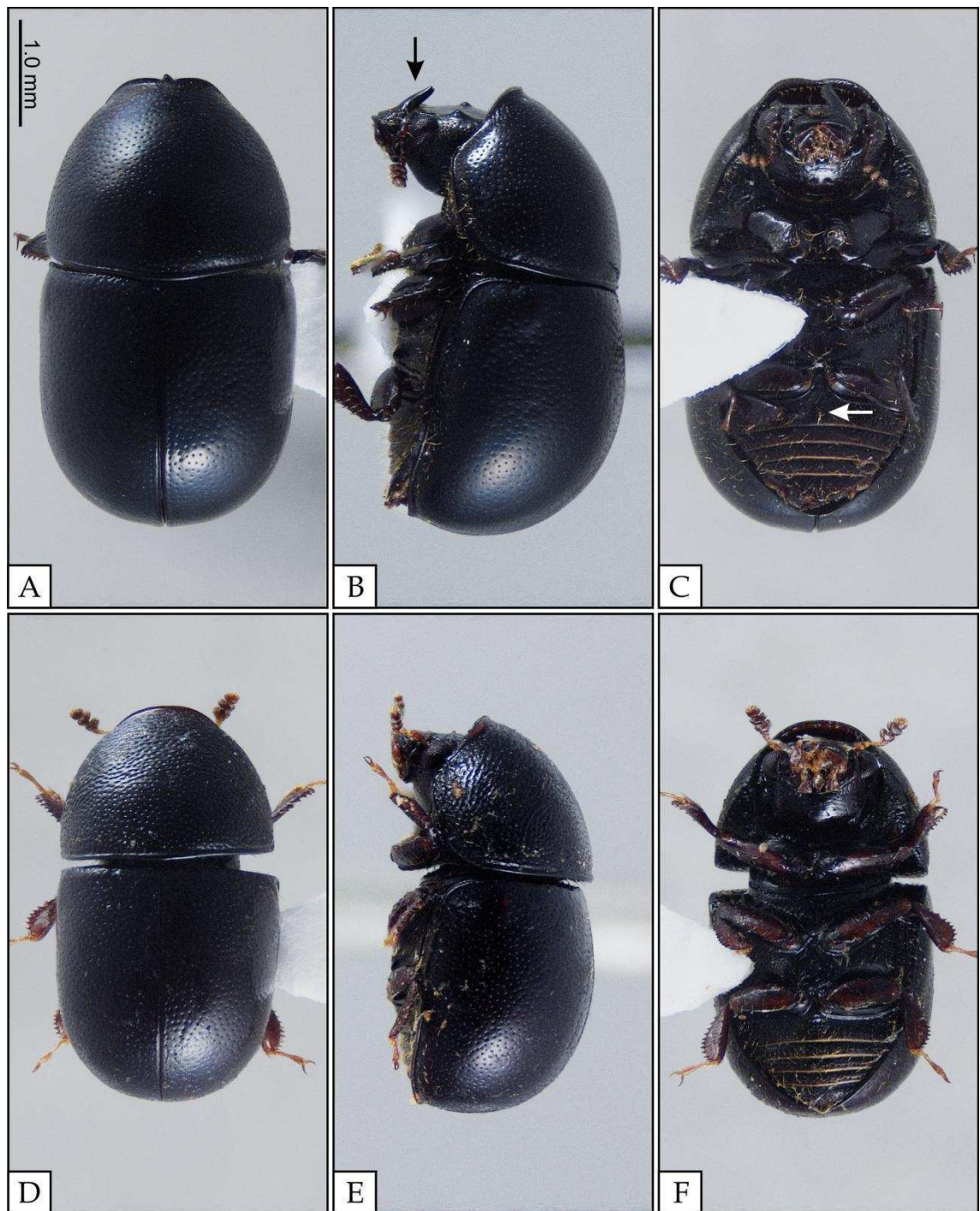


Fig. 25. Habitus of *Xylographus subopacus* Pic, 1929. Plesiotype male (A–C) from Democratic Republic of Congo, Eala (MRAC). A. Dorsal view. B. Lateral view, showing the tooth in the left mandible (arrow). C. Ventral view, showing the setose sex patch (arrow). Paralectotype female (D–F) from Democratic Republic of the Congo, Elisabethville (MNHN). D. Dorsal view. E. Lateral view. F. Ventral view. All figures in the same scale.

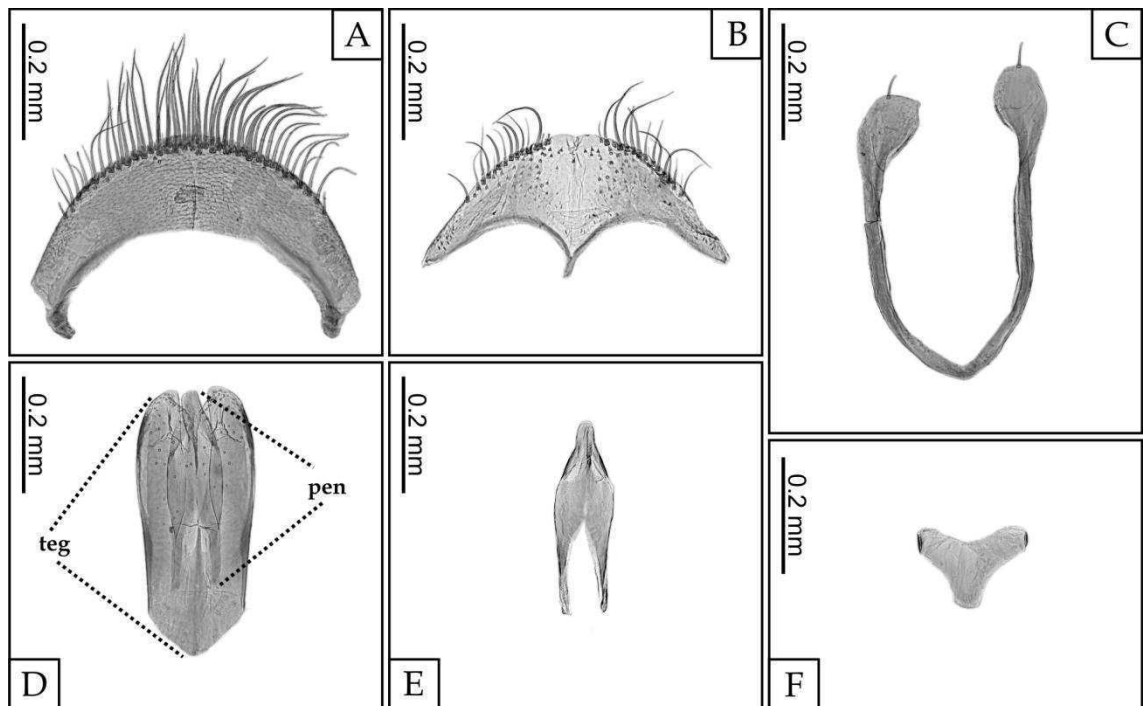


Fig. 26. Plesiotype male terminalia of *Xylographus subopacus* Pic, 1929 from Democratic Republic of the Congo, Eala (MRAC). A. Eighth tergite. B. Eighth sternite. C. Ninth segment. D. Aedeagus. E. Penis. F. Basal piece. Abbreviations: teg, tegmen; pen, penis.

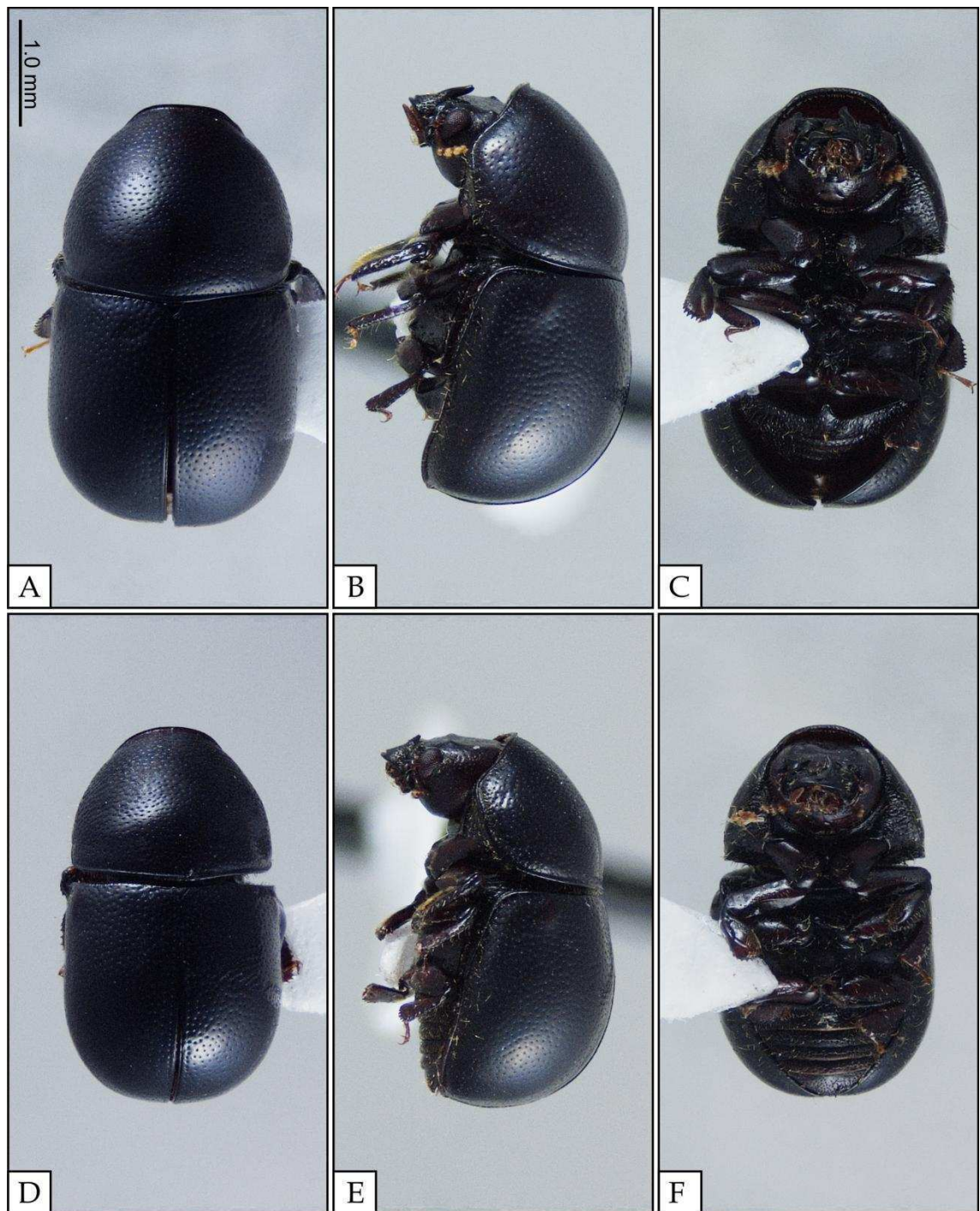


Fig. 27. Habitus of *Xylographus subopacus* Pic, 1929. Medium-sized male (A–C) from Democratic Republic of the Congo, Eala (MRAC). A. Dorsal view. B. Lateral view. C. Ventral view. Small-sized male (D–F) from Democratic Republic of the Congo, Lemba (MRAC). D. Dorsal view. E. Lateral view. F. Ventral view. All figures in the same scale.

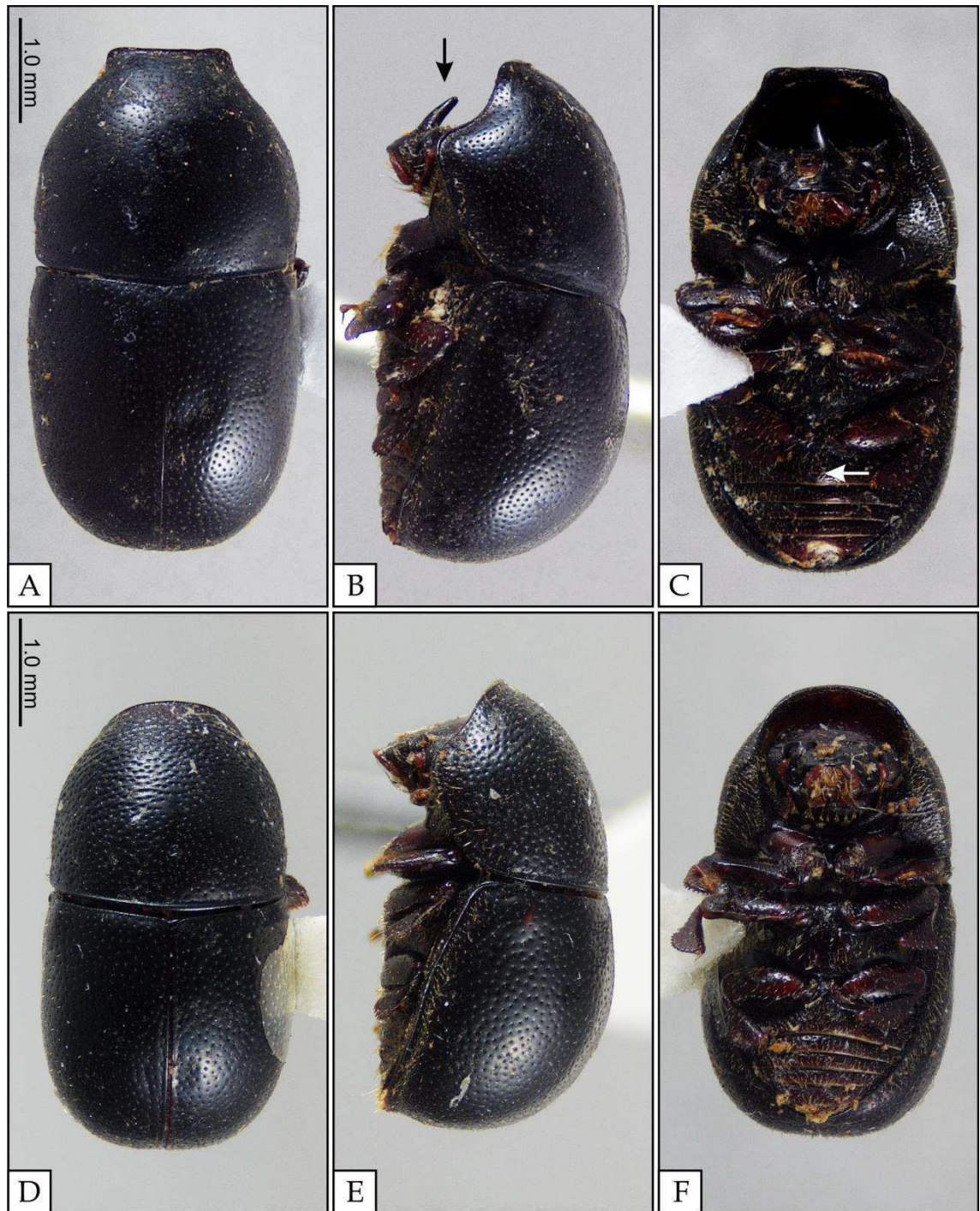


Fig. 28. Habitus of *Xylographus subsinuatus* Pic, 1916. Lectotype male (A–C). A. Dorsal view. B. Lateral view, showing the tooth in the left mandible (arrow). C. Ventral view, showing the setose sex patch (arrow). Paralectotype female (D–F). D. Dorsal view. E. Lateral view. F. Ventral view. Both specimens from Madagascar, Plantations du Sambirano (MNHN).

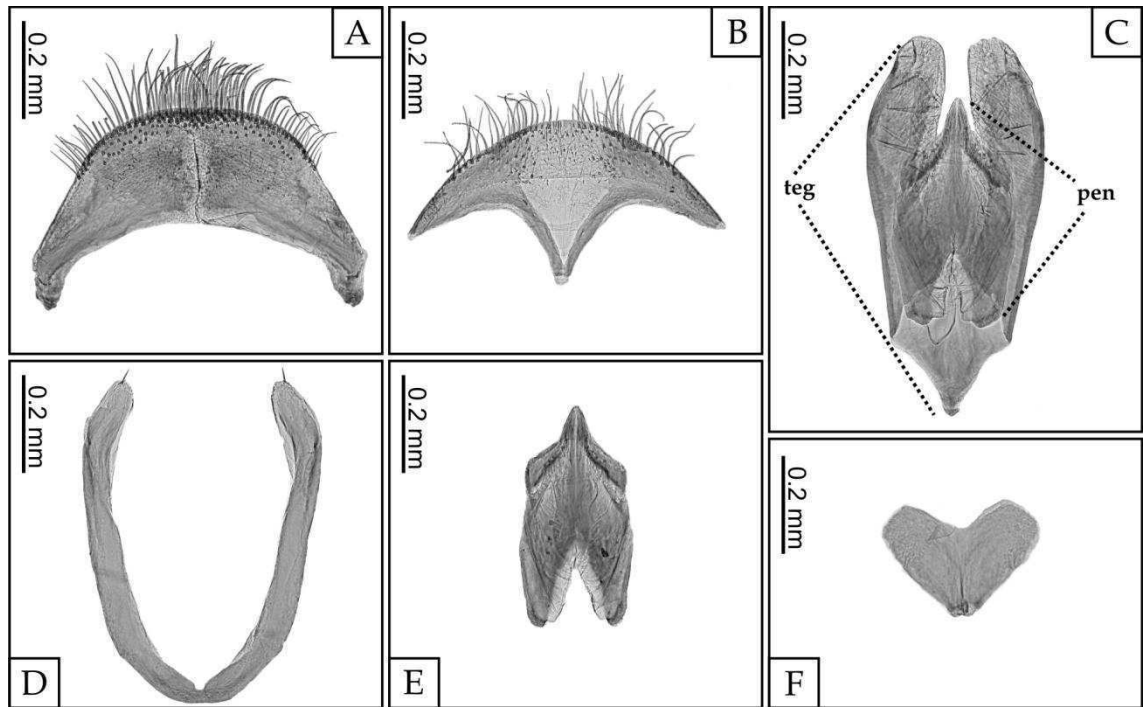


Fig. 29. Paralectotype male terminalia of *Xylographus subsinuatus* Pic, 1916 from Madagascar, Plantations du Sambirano (MNHN). A. Eighth tergite. B. Eighth sternite. C. Aedeagus. D. Ninth segment. E. Penis, from Madagascar, Nossi-Bé (MFNB). F. Basal piece. Abbreviations: teg, tegmen; pen, penis.

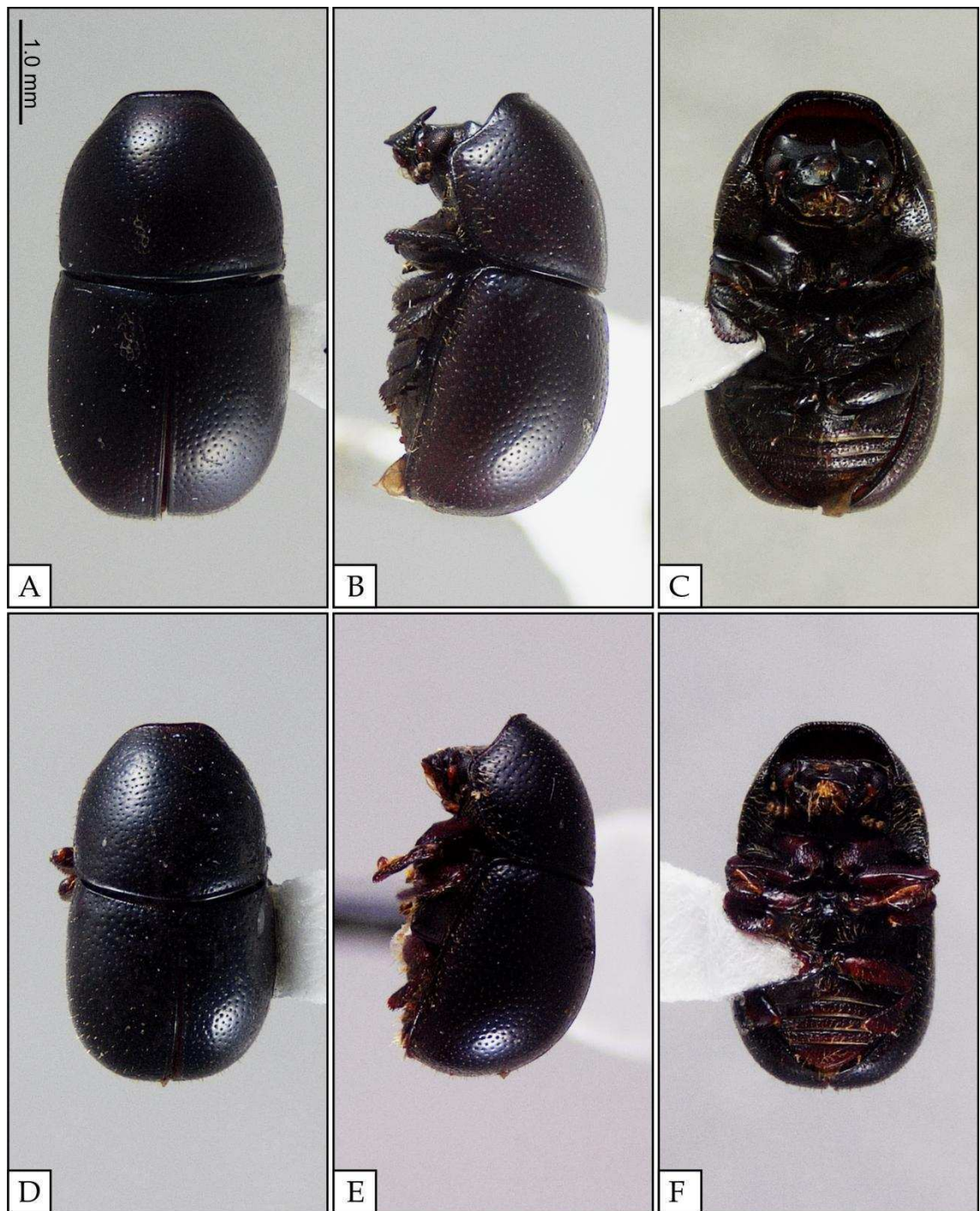


Fig. 30. Habitus of *Xylographus subsinuatus* Pic, 1916. Median-sized male (A–C). A. Dorsal view. B. Lateral view. C. Ventral view. Small-sized male (D–F). D. Dorsal view. E. Lateral view. F. Ventral view. Both specimens from Madagascar, Plantations du Sambirano (MNHN). All figures in the same scale.

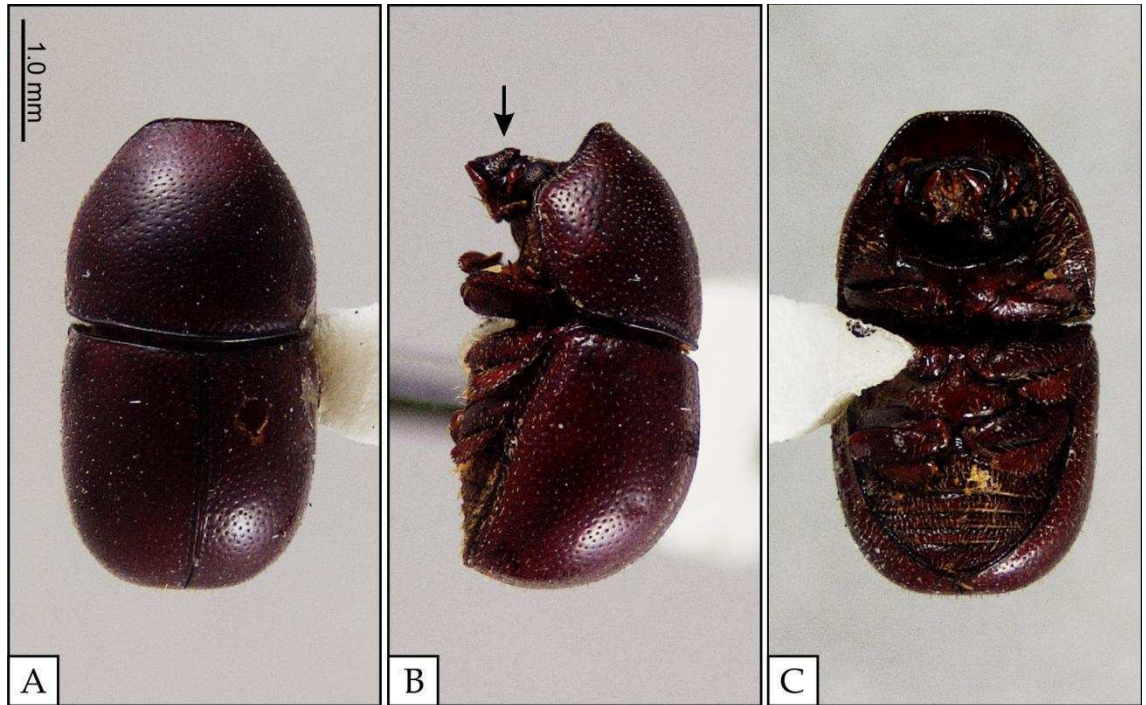


Fig. 31. Habitus of *Xylographus subsinuatus* Pic, 1916. Lectotype male (A–C) of *Xylographus rufescens* Pic, 1921, from Ile Bourbon (MNHN). All figures in the same scale.

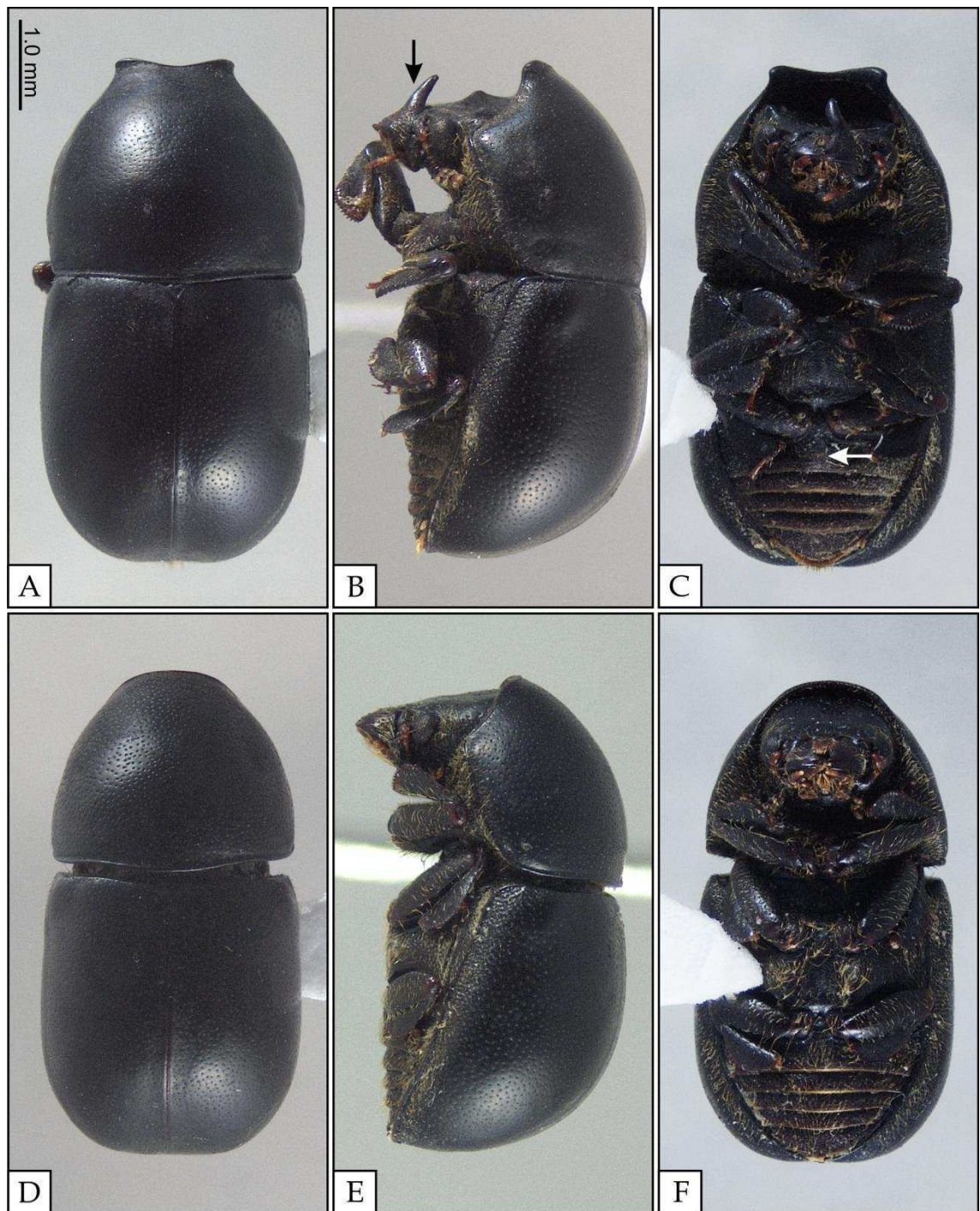


Fig. 32. Habitus of *Xylographus* sp. nov. 01 Sandoval-Gómez & Lopes-Andrade, 2013. Holotype male (A–C). A. Dorsal view. B. Lateral view, showing the tooth in the left mandible (arrow). C. Ventral view, showing the setose sex patch (arrow). Paratype female (D–F). D. Dorsal view. E. Lateral view. F. Ventral view. Both specimens from Madagascar (MFNB). All figures in the same scale.

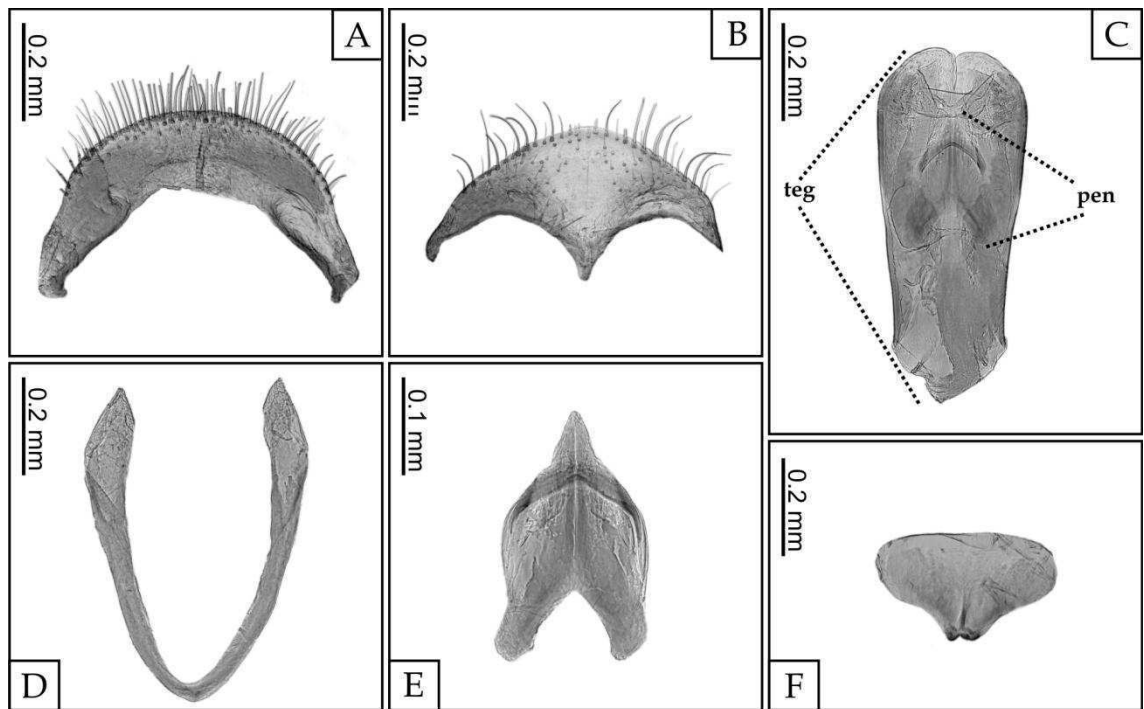


Fig. 33. Paratype male terminalia of *Xylographus* sp. nov. 01 Sandoval-Gómez & Lopes-Andrade, 2013 from Madagascar (MFNB) (C–E). Male terminalia from Madagascar, Antananarivo (FMNH) (A, B) A. Eighth tergite. B. Eighth sternite. C. Aedeagus. D. Ninth segment. E. Penis. F. Basal piece, from Madagascar (MNHN). Abbreviations: teg, tegmen; pen, penis.

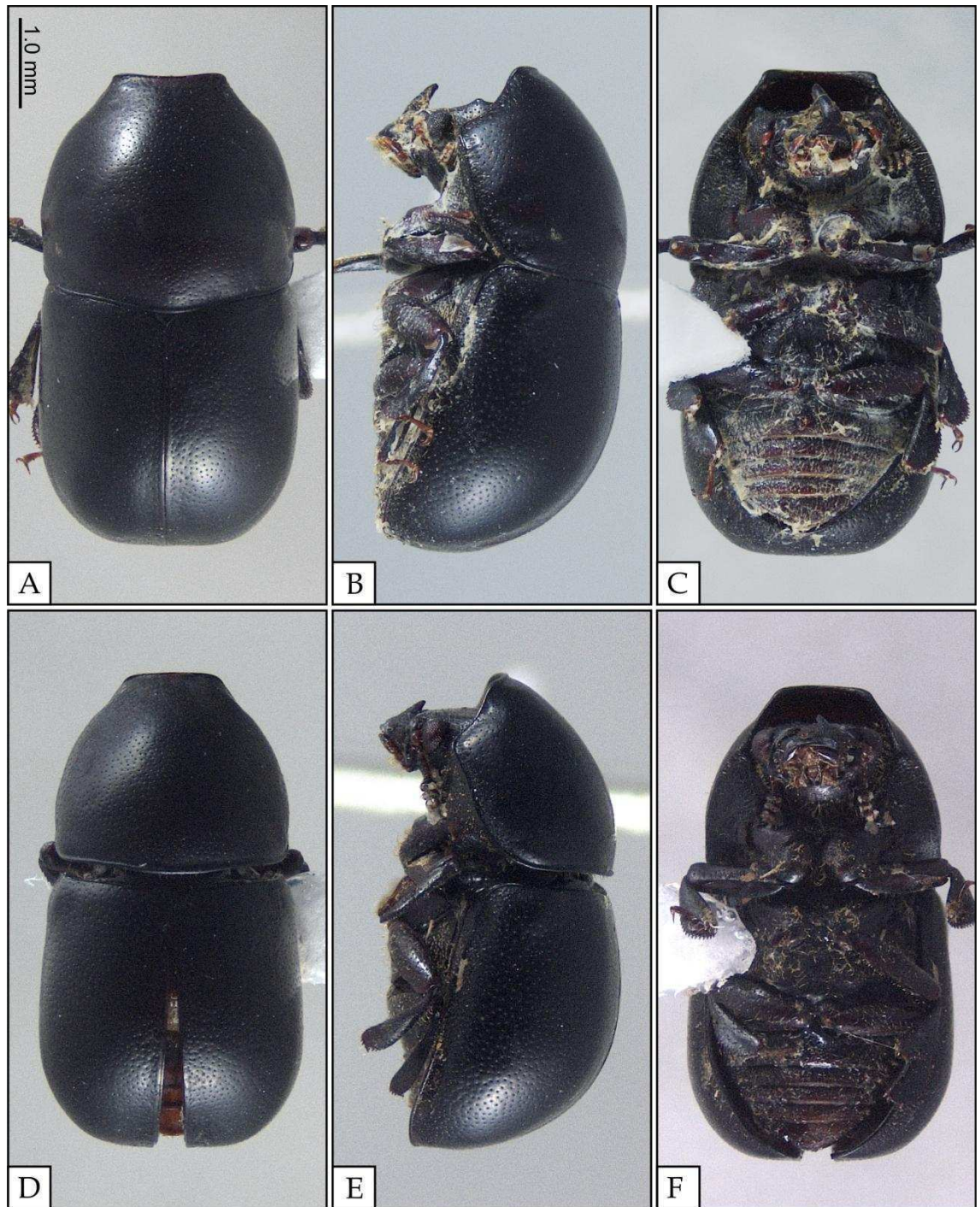


Fig. 34. Habitus of *Xylographus* sp. nov. 01 Sandoval-Gómez & Lopes-Andrade, 2013. Medium-sized male (A–C). A. Dorsal view. B. Lateral view. C. Ventral view. Small-sized male (D–F). D. Dorsal view. E. Lateral view. F. Ventral view. Both specimens from Madagascar (MFNB). All figures in the same scale.

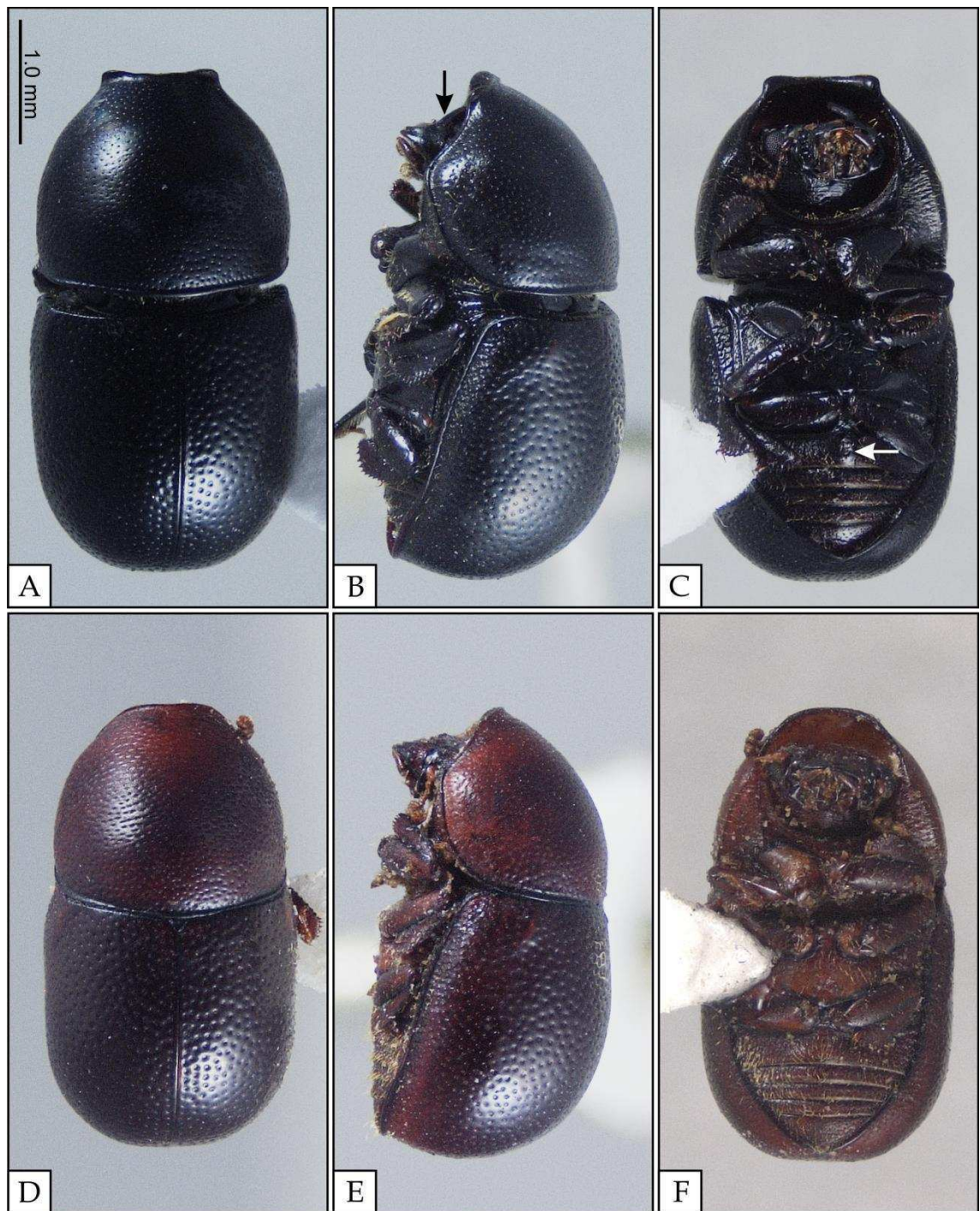


Fig. 35. Habitus of *Xylographus* sp. nov. 02 Sandoval-Gómez & Lopes-Andrade, 2013. Holotype male (A–C). A. Dorsal view. B. Lateral view, showing the tooth in the left mandible (arrow). C. Ventral view, showing the setose sex patch (arrow). Paratype female (D–F). D. Dorsal view. E. Lateral view. F. Ventral view. Both specimens from Democratic Republic of the Congo, Eala (MRAC). All figures in the same scale.

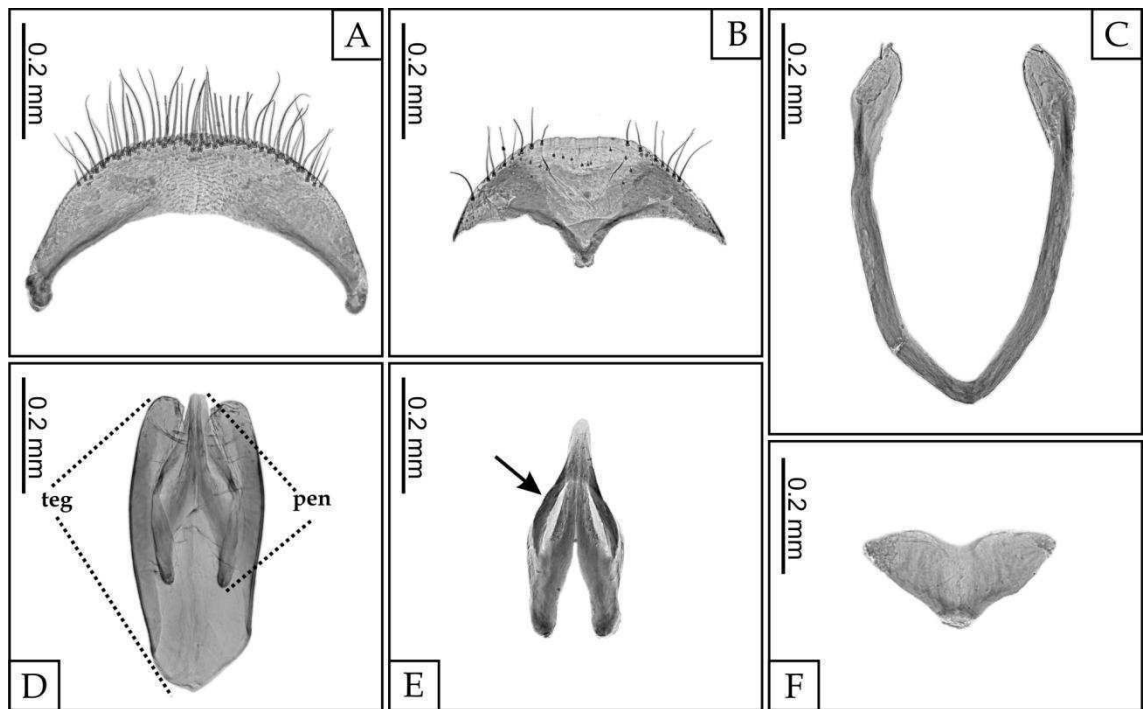


Fig. 36. Paratype male terminalia of *Xylographus* sp. nov. 02 Sandoval-Gómez & Lopes-Andrade, 2013 from Democratic Republic of the Congo, Eala (MRAC). A. Eighth tergite. B. Eight sternite. C. Ninth segment. D. Aedeagus, from Equatorial Guinea, Benito (MNHN). E. Penis, showing the sclerotized arch of the ventral lobe (arrow). F. Basal piece. Abbreviations: teg, tegmen; pen, penis.

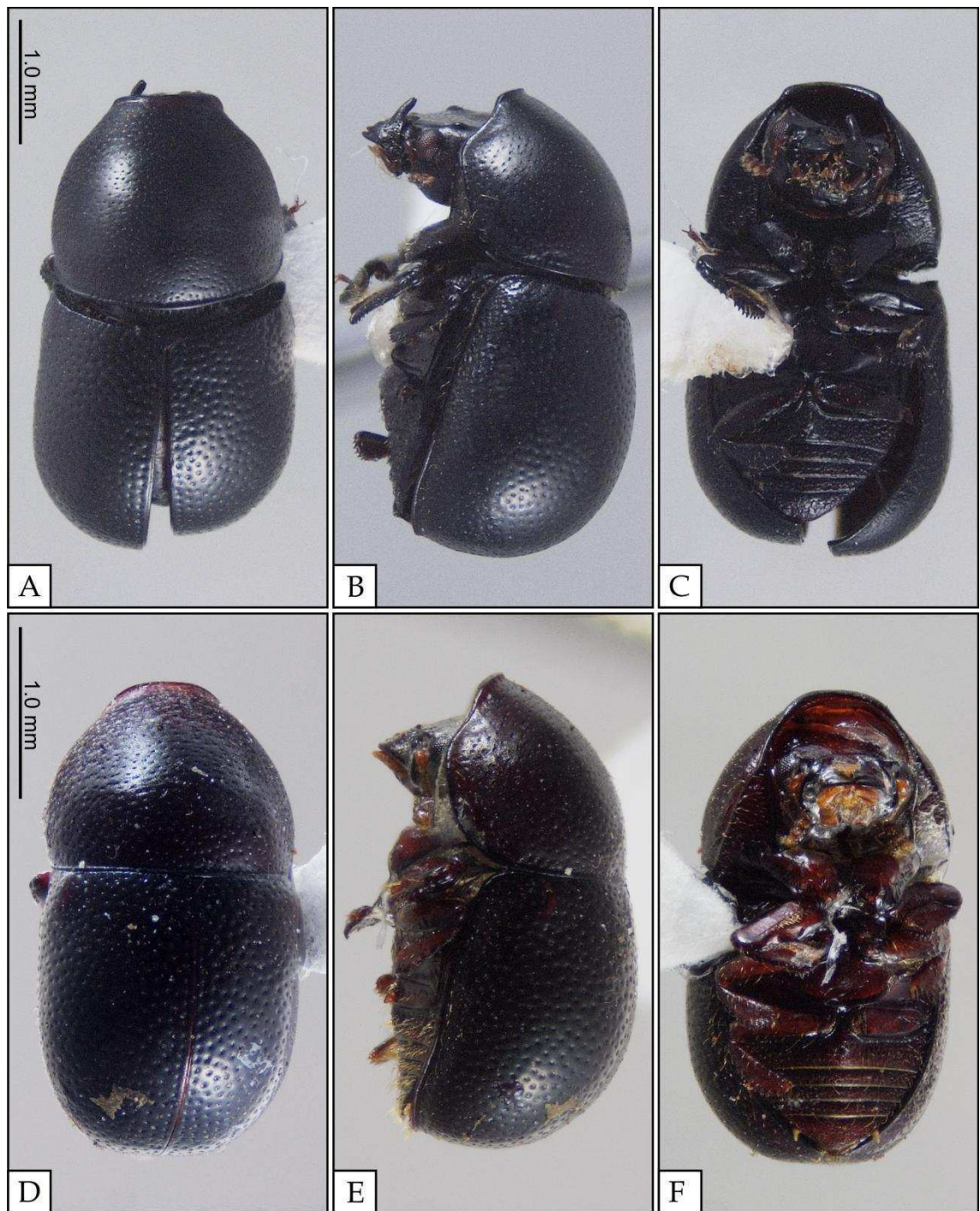


Fig. 37. Habitus of *Xylographus* sp. nov. 02 Sandoval-Gómez & Lopes-Andrade, 2013. Medium-sized male (A–C) from Democratic Republic of the Congo, Stanleyville (MRAC). A. Dorsal view. B. Lateral view. C. Ventral view. Small-sized male (D–F) from Equatorial Guinea, Benito (MNHN). D. Dorsal view. E. Lateral view. F. Ventral view.

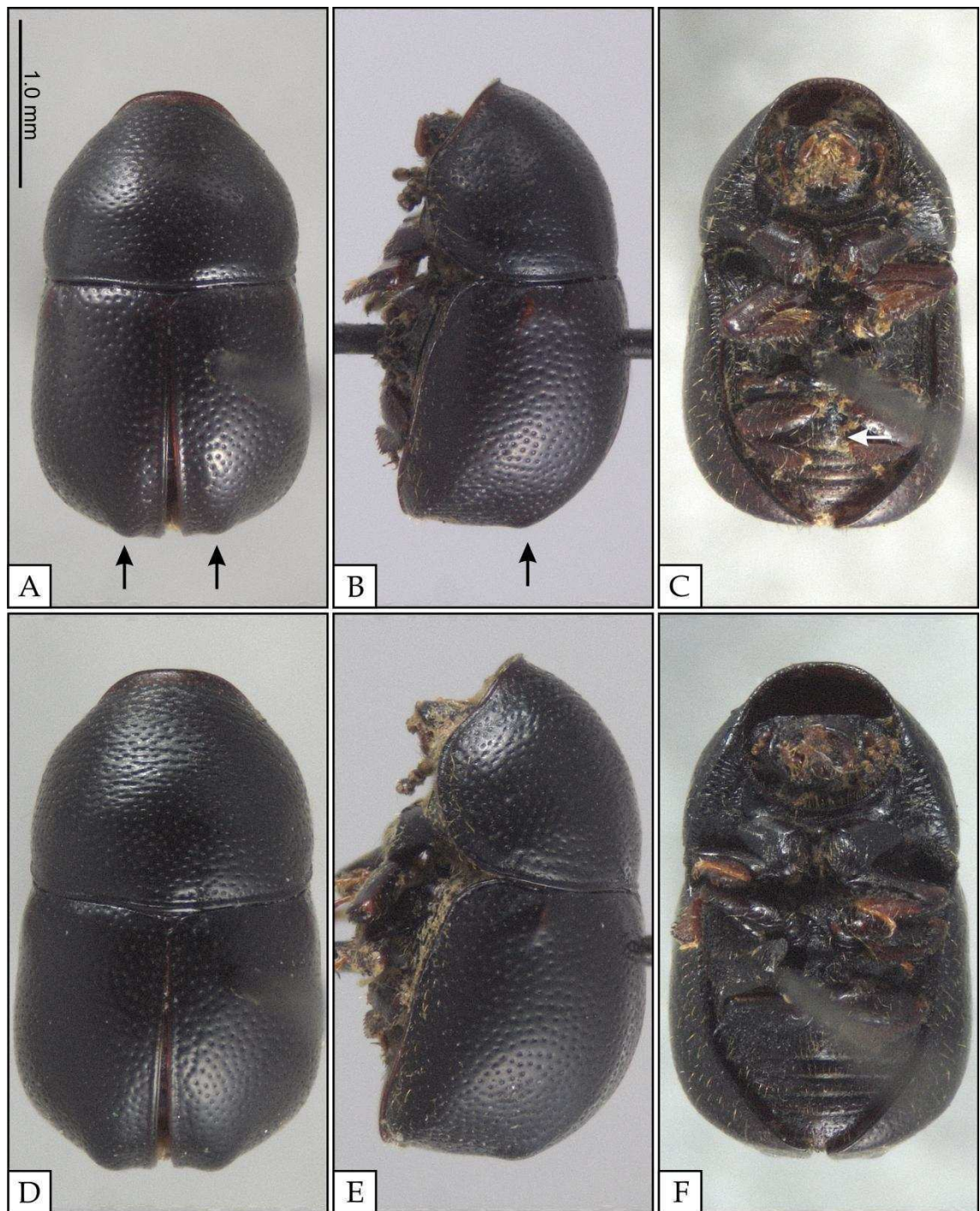


Fig. 38. Habitus of *Xylographus* sp. nov. 03 Sandoval-Gómez & Lopes-Andrade, 2013. Holotype male (A–C). A. Dorsal view, showing the two conspicuous calli at the posterior portion of elytra (arrows). B. Lateral view, showing the conspicuous calli at the posterior portion of elytra (arrow). C. Ventral view, showing the setose sex patch (arrow). Paratype female (D–F). D. Dorsal view. E. Lateral view. F. Ventral view. Both specimens from Cameroon, Mokundange (MFNB). All figures in the same scale.

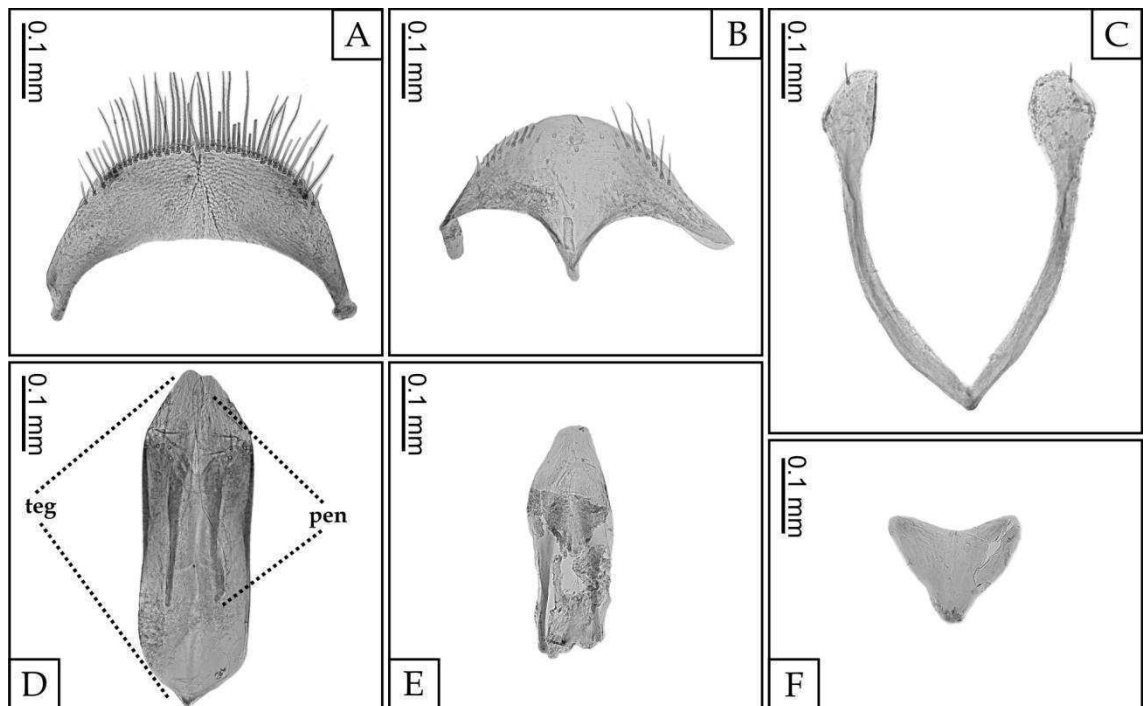


Fig. 39. Paratype male terminalia of *Xylographus* sp. nov. 03 Sandoval-Gómez & Lopes-Andrade, 2013 from Cameroon, Mokundange (MFNB). A. Eighth tergite. B. Eighth sternite. C. Ninth segment. D. Aedeagus. E. Penis. F. Basal piece. Abbreviations: teg, tegmen; pen, penis.

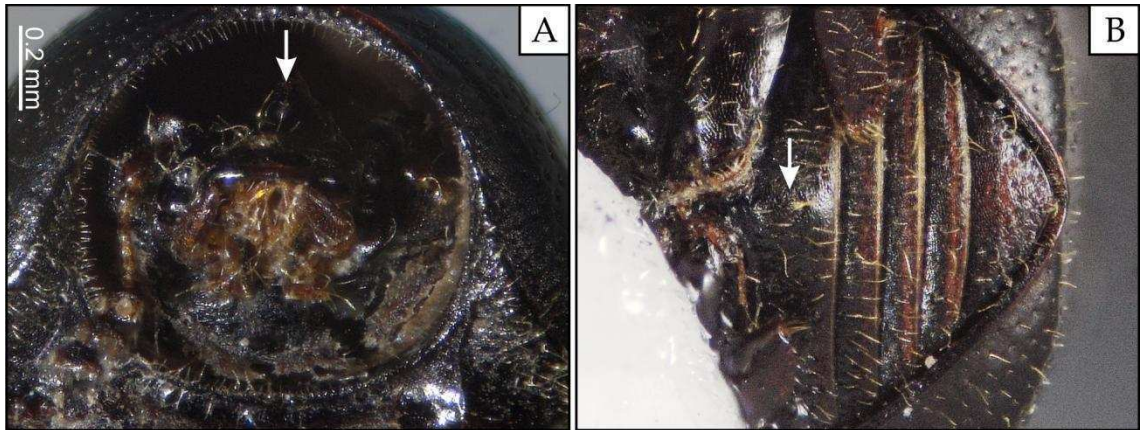


Fig. 40. *Xylographus* sp. nov. 03 Sandoval-Gómez & Lopes-Andrade, 2013. A. Head showing the tooth in the left mandible of a male (arrow). B. Abdominal ventrites of a female, showing the small circular setose sex patch (arrow). Both specimens from Cameroon, Mokundange (MFNB). All figures in the same scale.

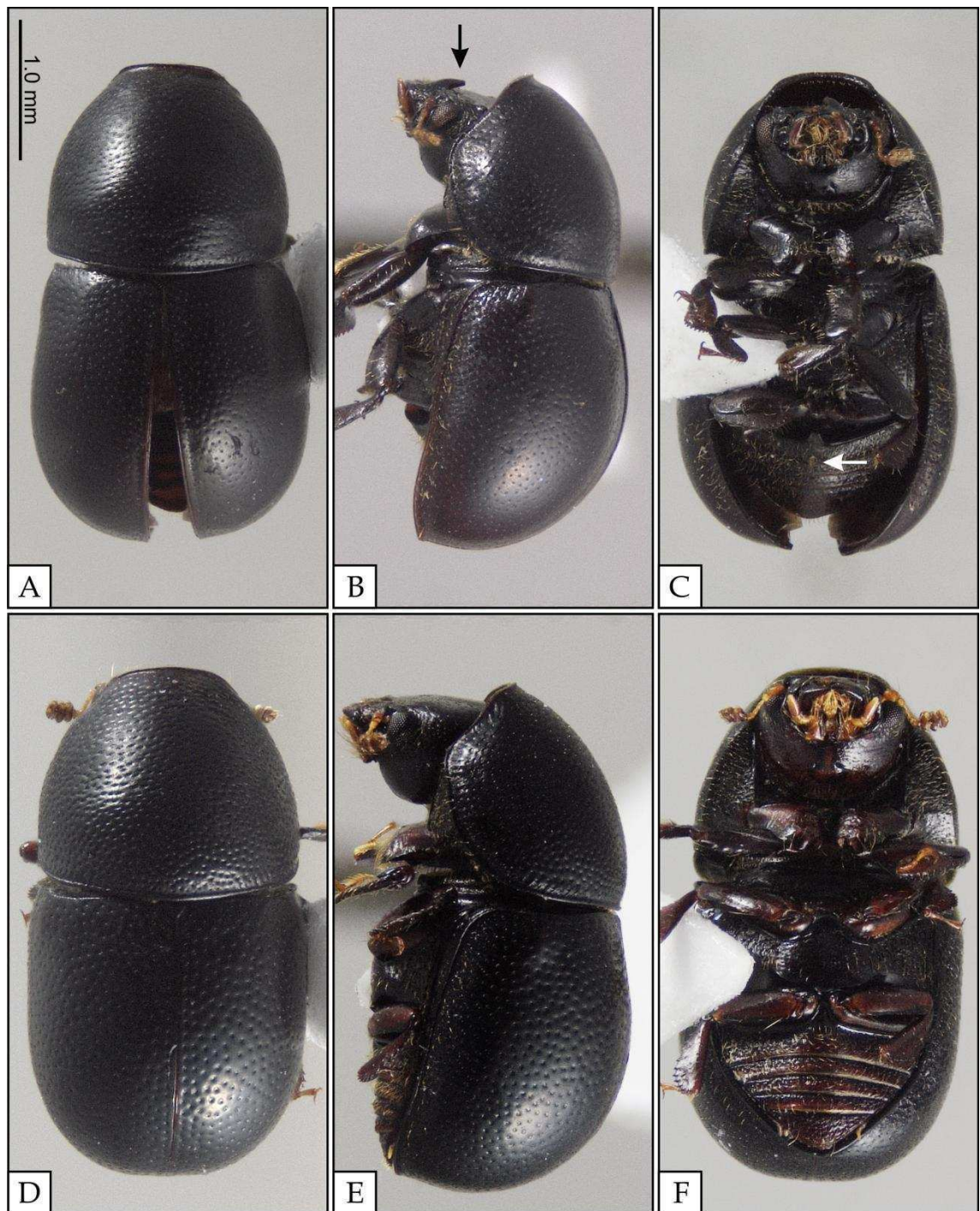


Fig. 41. Habitus of *Xylographus* sp. nov. 04 Sandoval-Gómez & Lopes-Andrade, 2013. Holotype male (A–C). A. Dorsal view. B. Lateral view, showing the tooth in the left mandible (arrow). C. Ventral view, showing the setose sex patch (arrow). Paratype female (D–F). D. Dorsal view. E. Lateral view. F. Ventral view. Both specimens from Ivory Coast, Parc du Banco (MHNG). All figures in the same scale.

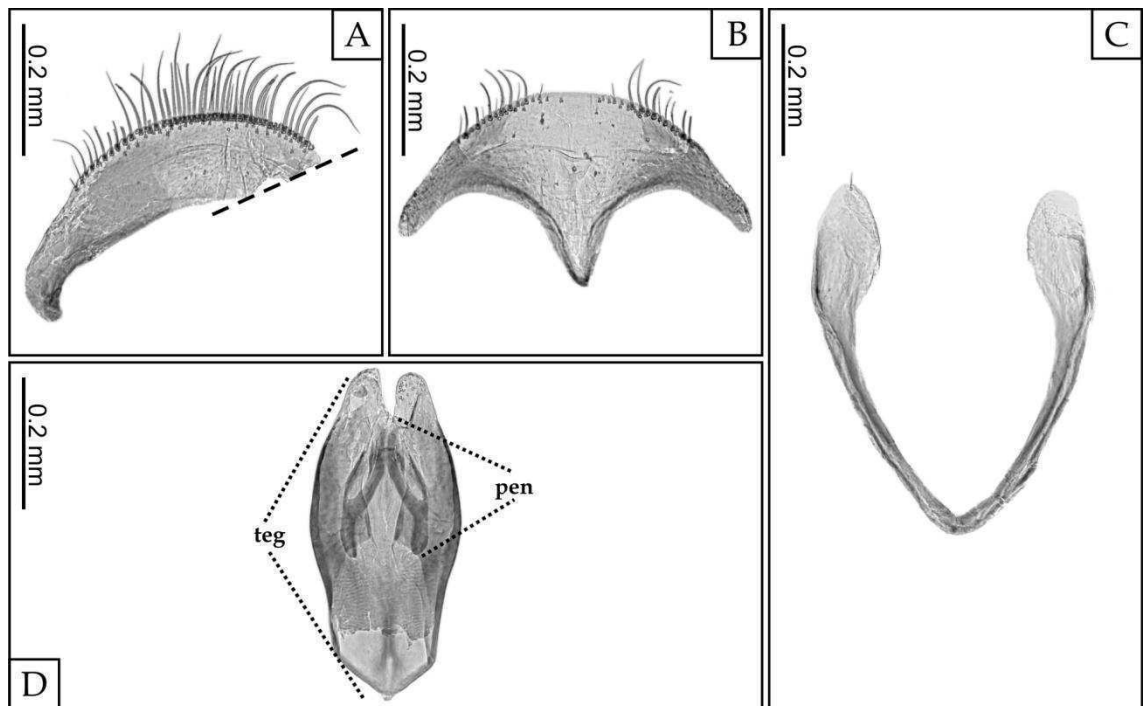


Fig. 42. Holotype male terminalia of *Xylographus* sp. nov. 04 Sandoval-Gómez & Lopes-Andrade, 2013 from Ivory Coast, Parc du Banco (MHNG). A. Eighth tergite, broken (dashed line). B. Eight sternite. C. Ninth segment. D. Aedeagus. Abbreviations: teg, tegmen; pen, penis.

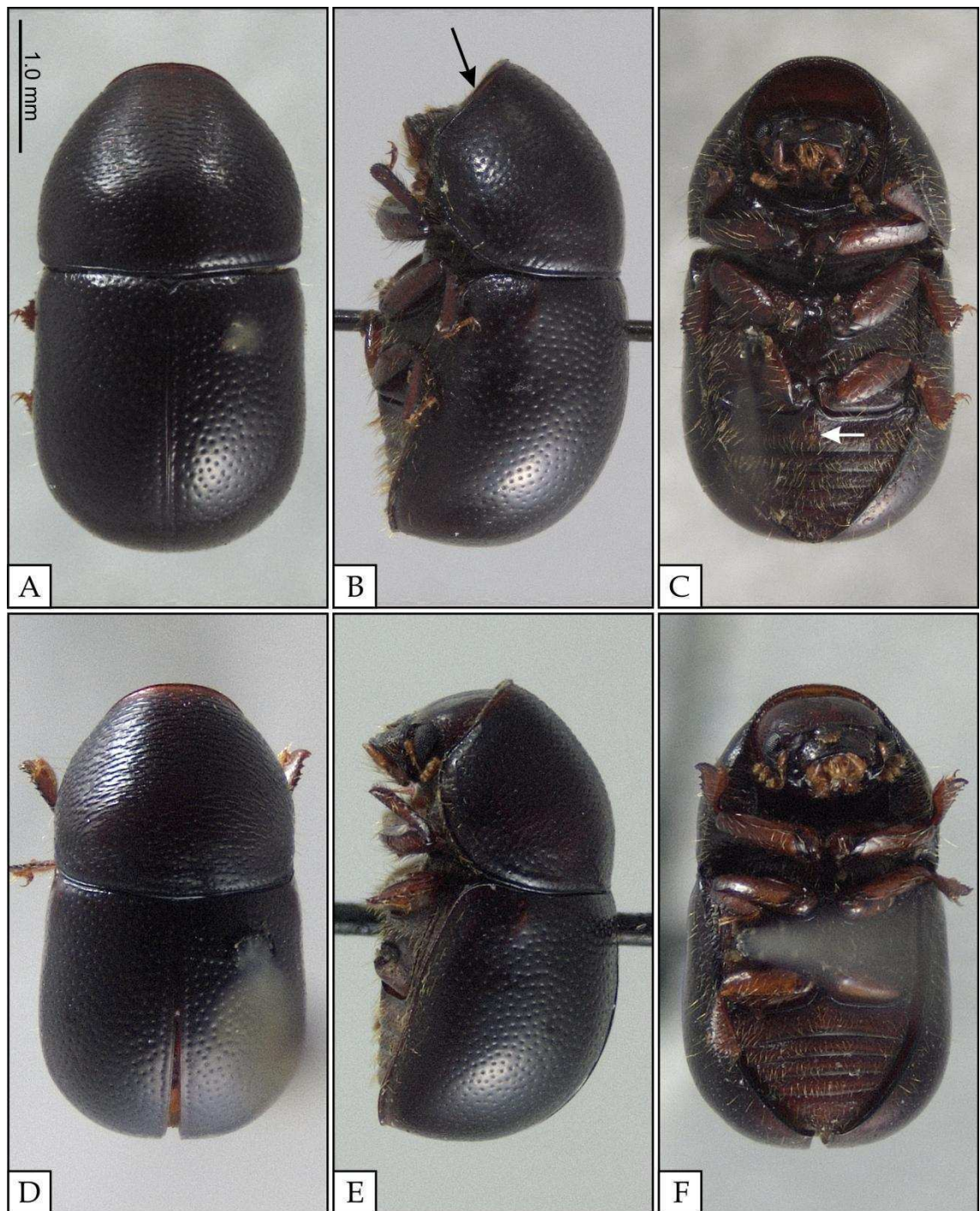


Fig. 43. Habitus of *Xylographus* sp. nov. 05 Sandoval-Gómez & Lopes-Andrade, 2013. Holotype male (A–C). A. Dorsal view. B. Lateral view, showing the straight lateral margin of the anterior projection of pronotum (arrow). C. Ventral view, showing the setose sex patch (arrow). Female (D–F). D. Dorsal view. E. Lateral view. F. Ventral view. Both specimens from Cameroon (MFNB). All specimens in the same scale.

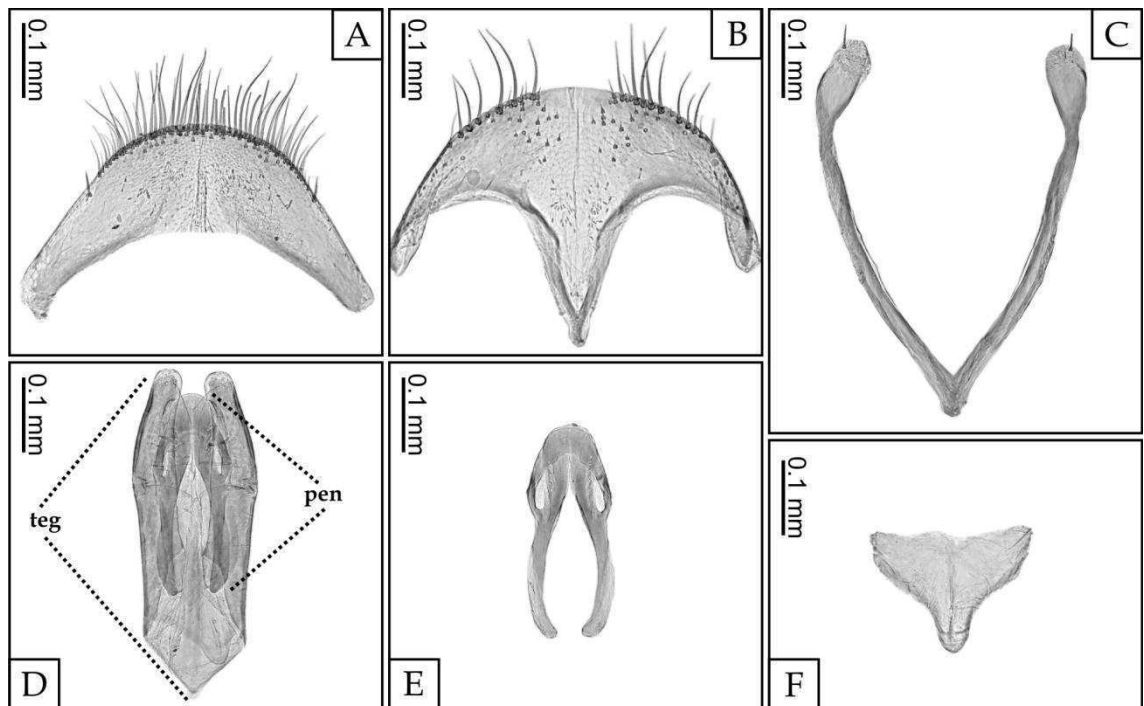


Fig. 44. Paratype male terminalia of *Xylographus* sp. nov. 05 Sandoval-Gómez & Lopes-Andrade, 2013 from Cameroon (MFNB). A. Eighth tergite. B. Eighth sternite. C. Ninth segment. D. Aedeagus. E. Penis. F. Basal piece. Abbreviations: teg, tegmen; pen, penis.

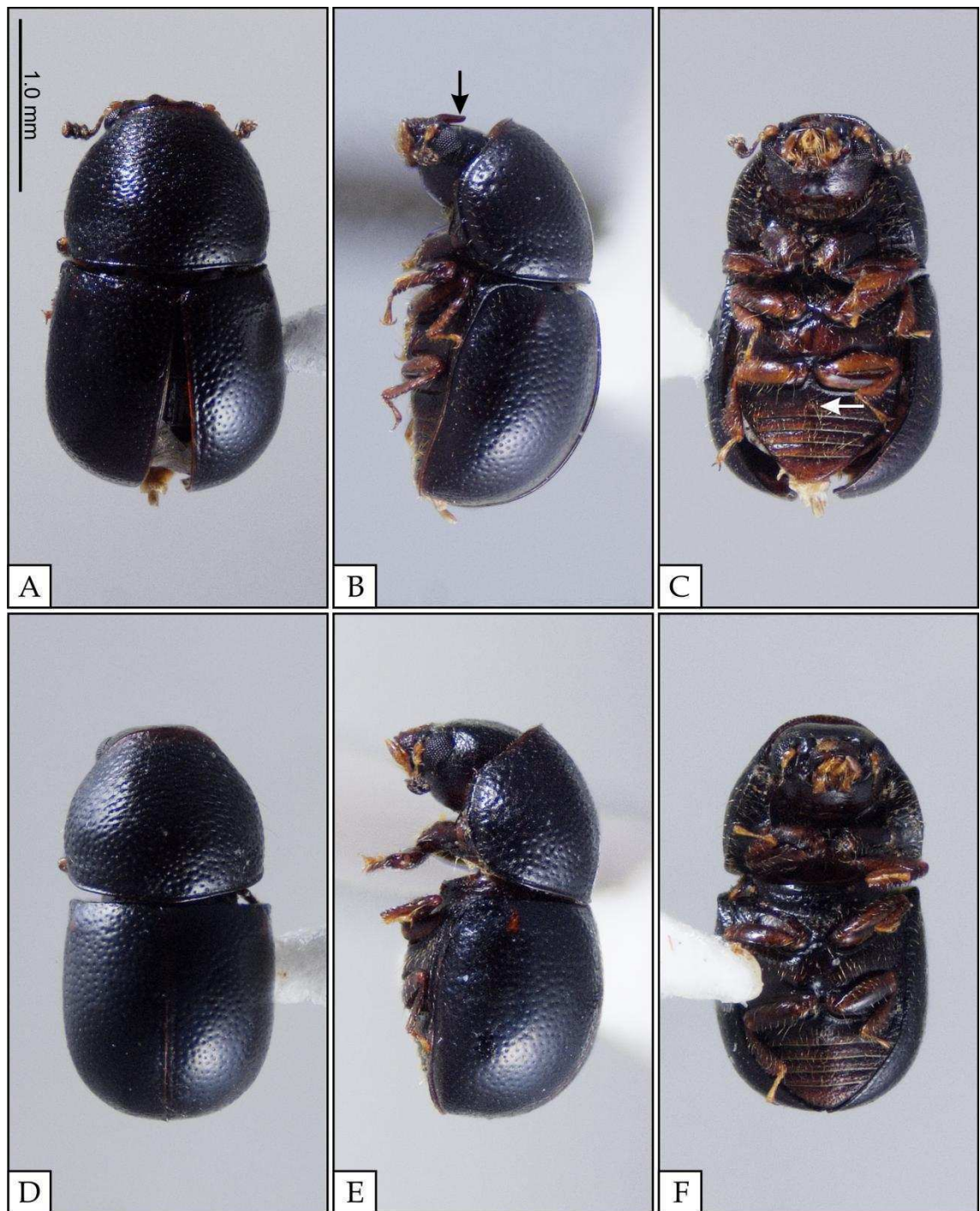


Fig. 45. Habitus of *Xylographus* sp. nov. 06 Sandoval-Gómez & Lopes-Andrade, 2013. Holotype male (A–C). A. Dorsal view. B. Lateral view, showing the tooth in the left mandible (arrow). C. Ventral view, showing the setose sex patch (arrow). Paratype female (D–F). D. Dorsal view. E. Lateral view. F. Ventral view. Both specimens from Ivory Coast, Sangouiné (MHNG). All figures in the same scale.

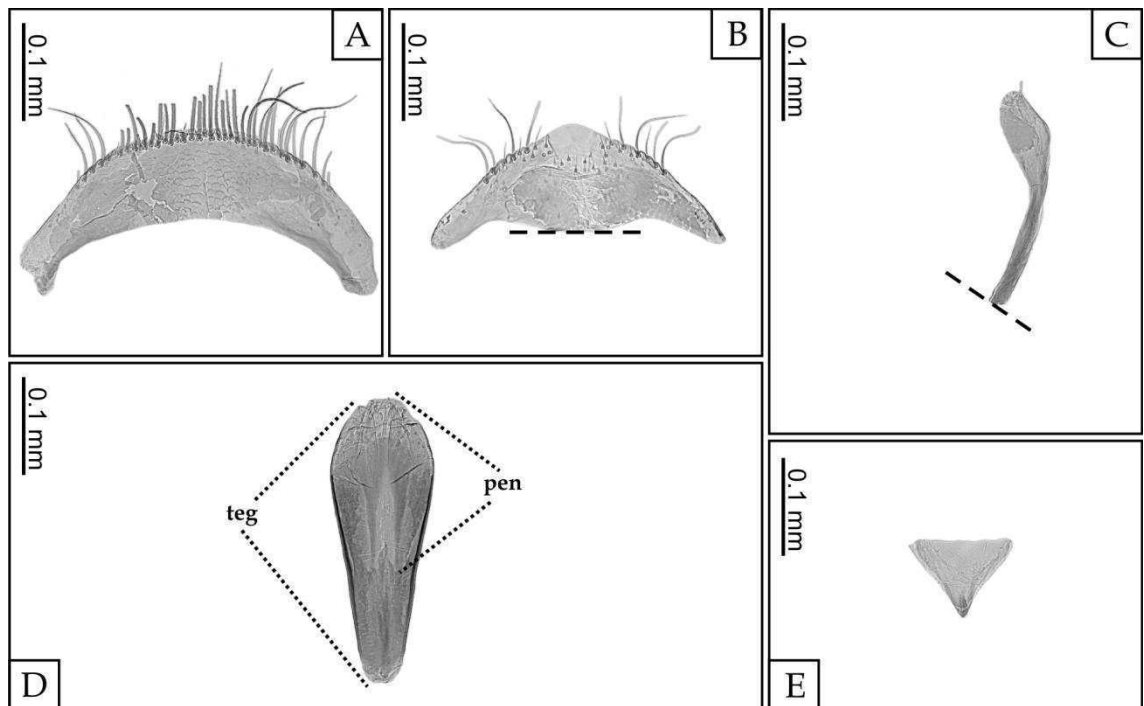


Fig. 46. Paratype male terminalia of *Xylographus* sp. nov. 06 Sandoval-Gómez & Lopes-Andrade, 2013 from Ivory Coast, Sangouiné (MHNG). A. Eighth tergite. B. Eight sternite, broken (dashed line). C. Ninth segment, broken (dashed line). D. Aedeagus. E. Basal piece. Abbreviations: teg, tegmen; pen, penis.

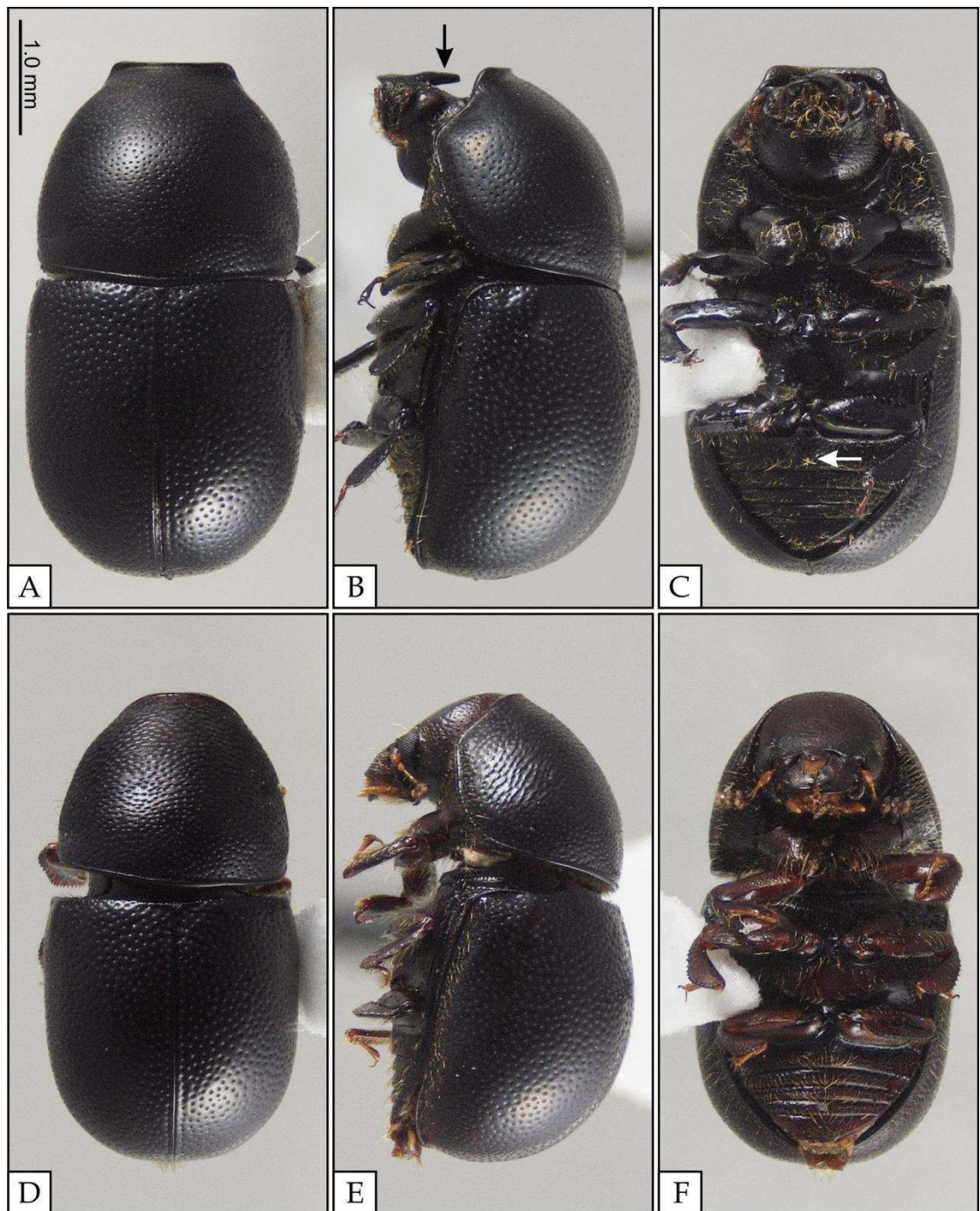


Fig. 47. Habitus of *Xylographus* sp. nov. 07 Sandoval-Gómez & Lopes-Andrade, 2013. Holotype male (A–C). A. Dorsal view. B. Lateral view, showing the tooth in the left mandible (arrow). C. Ventral view, showing the setose sex patch (arrow). Paratype female (D–F). D. Dorsal view. E. Lateral view. F. Ventral view. Both specimens from Democratic Republic of the Congo, Mont Kabobo (MRAC). All figures in the same scale.

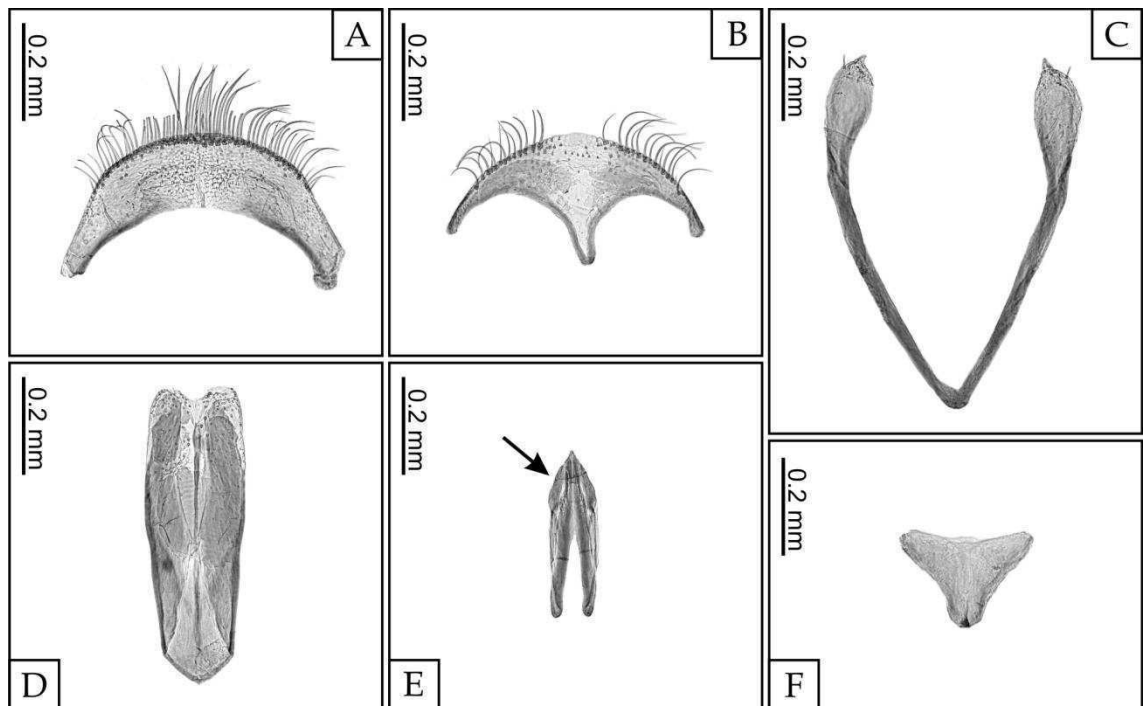


Fig. 48. Paratype male terminalia of *Xylographus* sp. nov. 07 Sandoval-Gómez & Lopes-Andrade, 2013 from Democratic Republic of the Congo, Mont Kabobo (MRAC). A. Eighth tergite. B. Eighth sternite. C. Ninth segment. D. Tegmen. E. Penis, showing the sclerotized arch of the ventral lobe (arrow). F. Basal piece. Abbreviations: teg, tegmen; pen, penis.

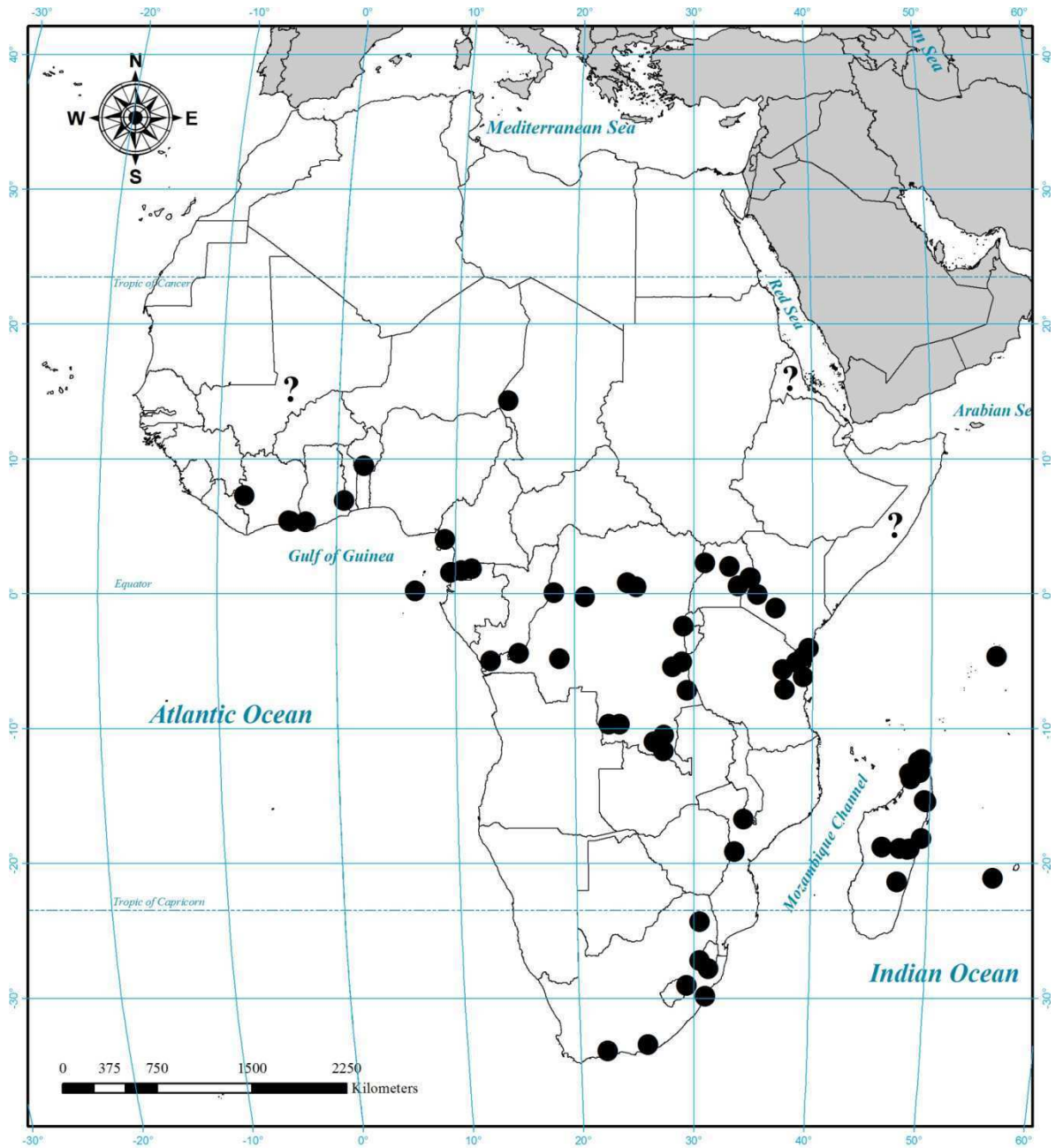


Fig. 49. Distribution map for Afrotropical and Afrotemperate species of *Xylographus* Mellie, 1847 (full circles). The question mark indicates imprecise location.

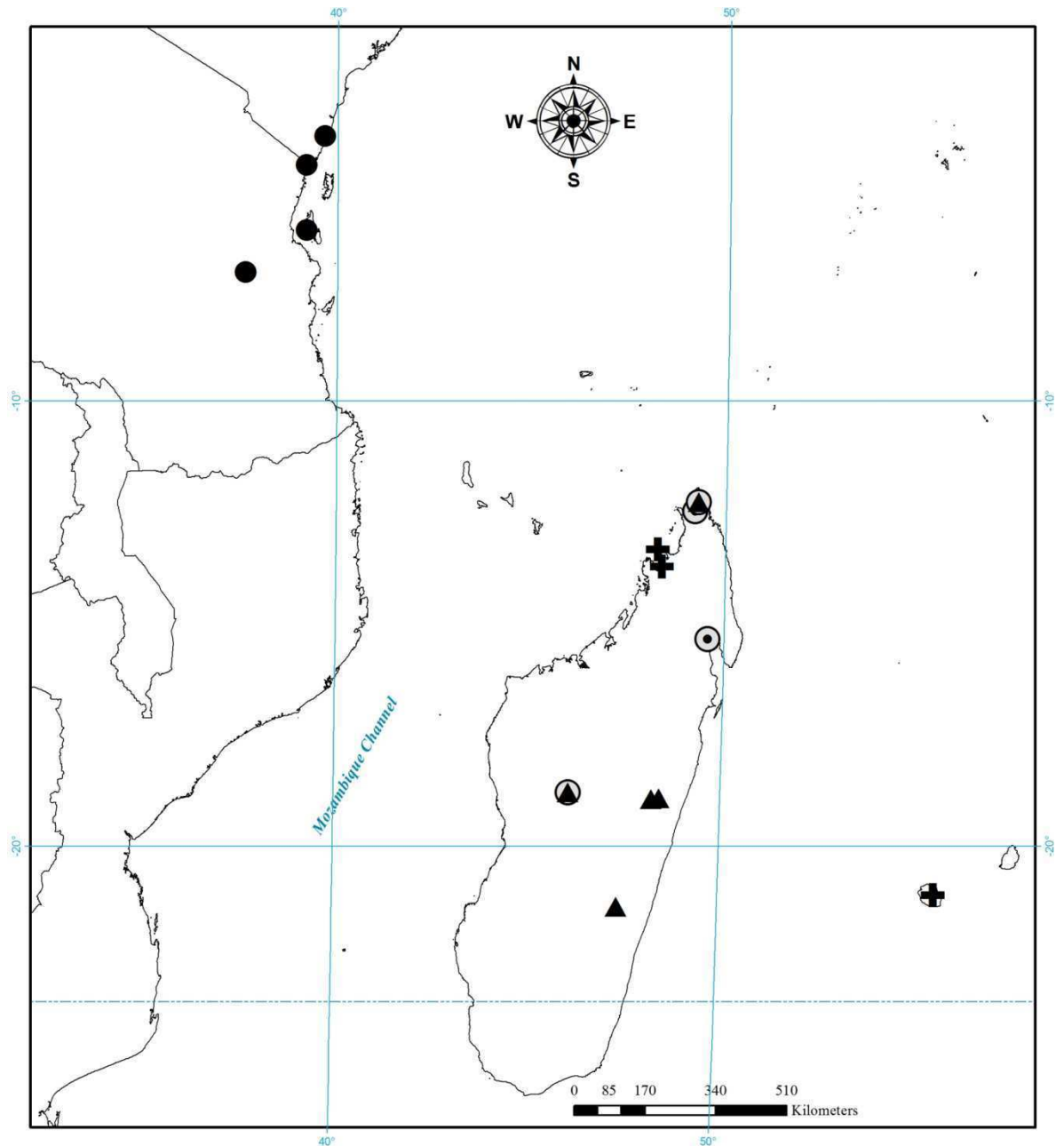


Fig. 50. Distribution map for *Xylographus anthracinus* Mellié (double circle), *X. bicolor* Pic (full triangle), *X. perforatus* Gerstaecker (full circle) and *X. subsinuatus* Pic (Greek cross).

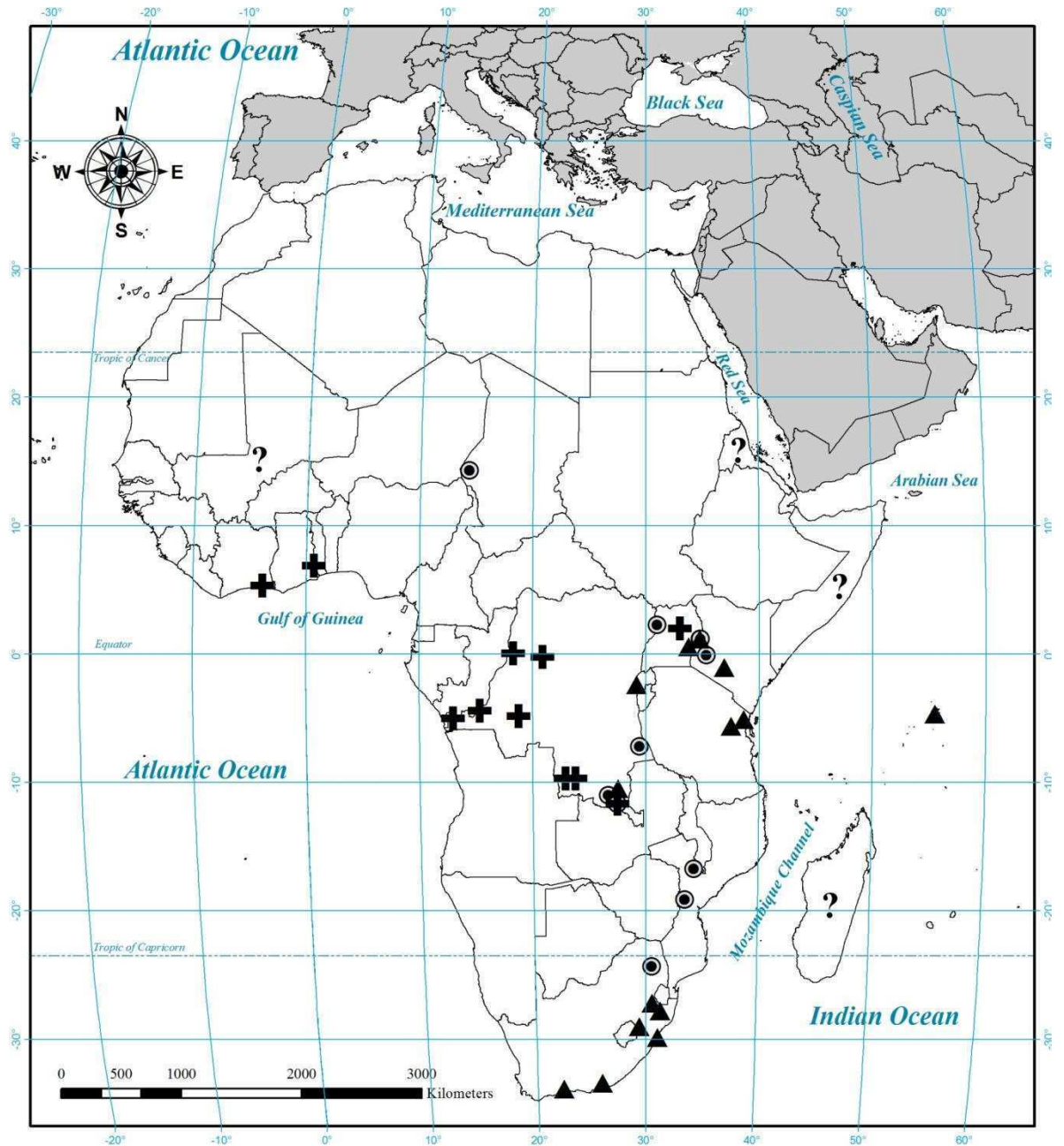


Fig. 51. Distribution map for *Xylographus globipennis* Reitter (double circle), *X. madagascariensis* Mellié (full triangle) and *X. subopacus* Pic (Greek cross). The question mark indicates imprecise location in the distribution of *X. globipennis*. In Madagascar, the question mark also corresponds to the species *X. madagascariensis*.

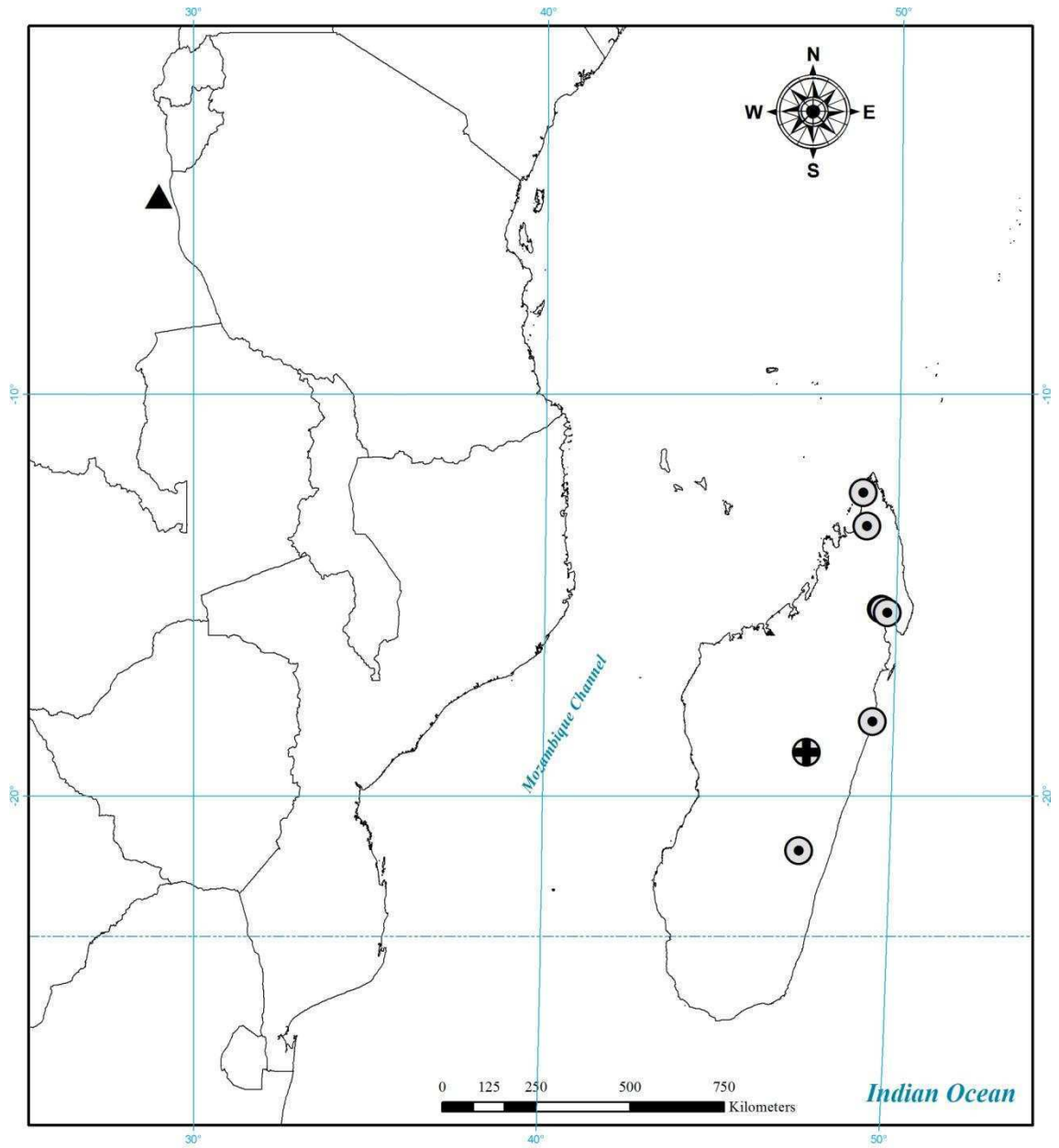


Fig. 52. Distribution map for *Xylographus hypocritus* Mellié (double circle), *Xylographus sp. nov.* 1 (Greek cross) and *Xylographus sp. nov.* 7 (full triangle).

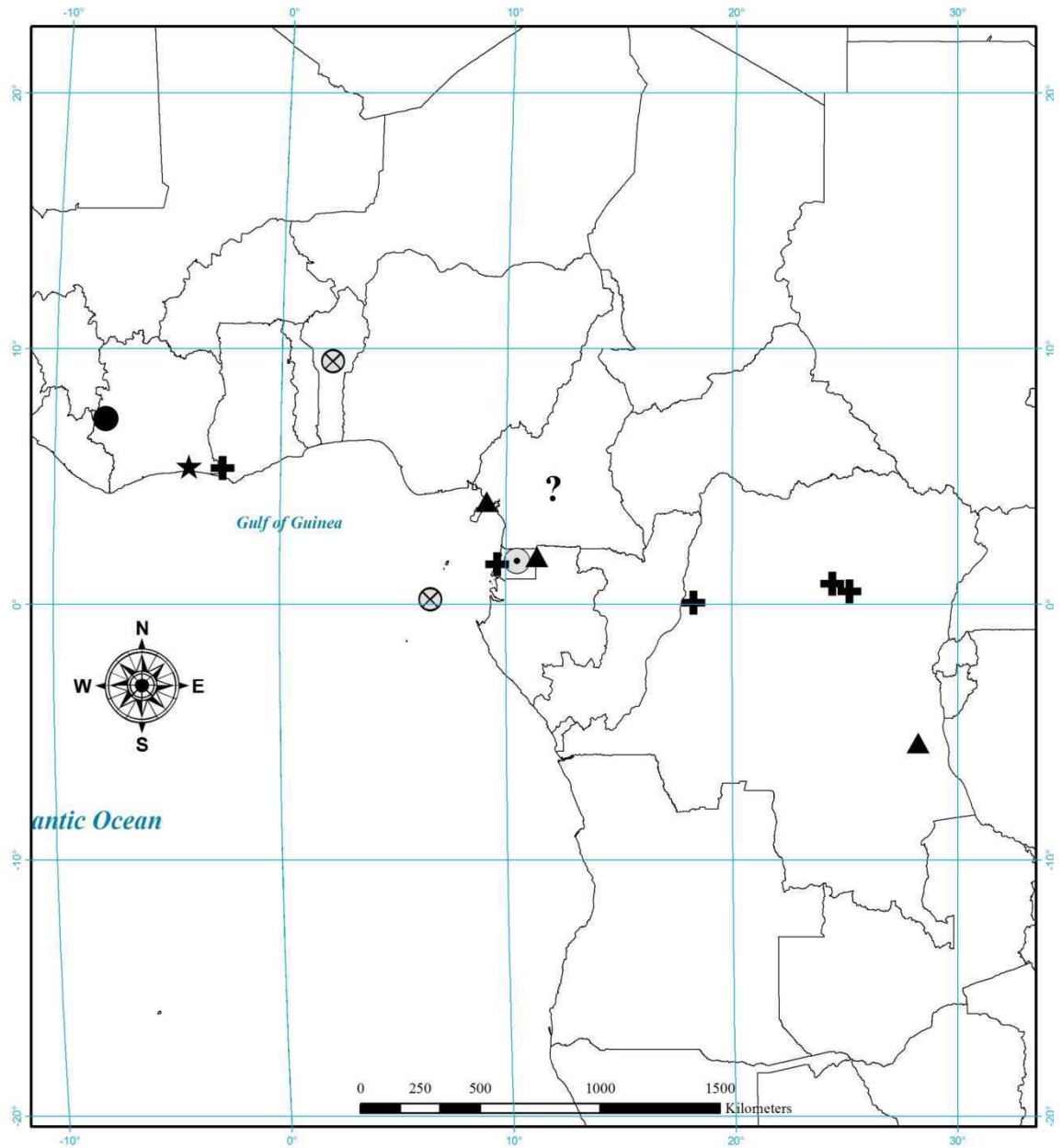


Fig. 53. Distribution map for *Xylographus nitidissimus* Pic (X inside circle), *Xylographus* **sp. nov.** 2 (Greek cross), *Xylographus* **sp. nov.** 3 (full triangle), *Xylographus* **sp. nov.** 4 (full star), *Xylographus* **sp. nov.** 5 (double circle) and *Xylographus* **sp. nov.** 6 (full circle). The question mark indicates imprecise location in the distribution of *X. nitidissimus* and *Xylographus* **sp. nov.** 5.

5. CONCLUSÕES GERAIS

As informações disponíveis sobre as faunas Afrotropical e Afrotemperada do gênero *Xylographus* Mellié, 1847 (Coleoptera: Ciidae), e as observações do presente trabalho, permitem concluir que:

O gênero *Xylographus* está amplamente distribuído nas regiões Afrotropical e Afrotemperada continentais, desde Chade e Mali como limites mais ao norte, até Costa do Marfim ao oeste, Eritréia ao nordeste, Moçambique ao sudeste e África do Sul no limite mais austral. Também está presente nas ilhas de São Tomé do Oceano Atlântico, e nas maiores Ilhas do Oceano Índico, incluindo Madagascar, Seicheles e Reunião.

A sub-região mais diversa da região Afrotropical corresponde à selva equatorial africana, que se estende pelo litoral desde a Guiné até à República Democrática do Congo, com oito espécies de *Xylographus*. Outra subregião muito diversa é a da Ilha de Madagascar e Ilhas Seicheles, com cinco espécies endêmicas nas suas florestas tropicais. A subregião afromontana apresenta uma baixa diversidade com duas espécies muito bem distribuídas como são *X. globipennis* e *X. madagascariensis*.

A região Afrotemperada apresenta uma espécie de *Xylographus*, *X. madagascariensis*, que está amplamente distribuída na subregião subtropical oriental da África, alcançando seu limite mais austral na região do Cabo da África do Sul.

Xylographus apresenta 16 espécies nas regiões Afrotropical e Afrotemperada, das quais nove já estavam descritas, sete foram sinonimizadas, uma foi transferida para o Cis e sete são novas para a ciência, totalizando 35 espécies de *Xylograpus* no mundo. O estudo das outras regiões biogeográficas é muito importante para confirmar a validade dos nomes das espécies descritas e aumentar os registros da sua distribuição geográfica.

A grande maioria das espécies de *Xylographus* que foram sinonimizadas tinham sido descritas a partir de um único espécime, com descrições pouco informativas e sem fazer comparações com a fauna de outras localidades, ou ainda tinham sido baseadas em uma fêmea que apresenta poucos caracteres taxonômicos relevantes. Portanto, é de vital

relevância o trabalho taxonômico detalhado, baseado em grandes séries das diferentes regiões e evitar o uso de fêmeas nas descrições de novas espécies.

Os caracteres morfológicos externos mais evidentes nos machos de *Xylographus*, como a forma da projeção anterior do pronoto e a presença de um dente elevado na mandíbula esquerda, têm uma grande variação nos indivíduos da mesma espécie dependendo do seu tamanho. A terminália abdominal dos machos é muito estável dentro da mesma espécie, mas apresenta uma alta diversidade interespecífica, permitindo assim diferenciar claramente uma espécie de outra. Algumas proporções são estáveis dentre as espécies, o que dá importância aos trabalhos morfométricos no grupo. A terminália abdominal das fêmeas é pouco desenvolvida, impedindo assim seu uso como ferramenta taxonômica.