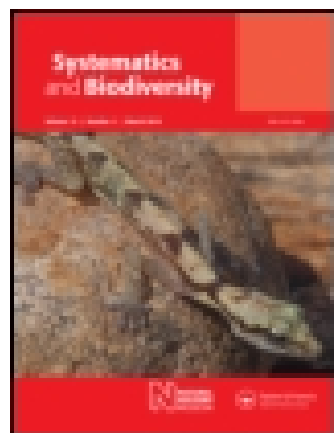




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A peculiar new genus and species of pollen-beetle (Coleoptera, Nitidulidae) from eastern Africa, with a molecular phylogeny of related Meligethinae

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Research Article

A peculiar new genus and species of pollen-beetle (Coleoptera, Nitidulidae) from eastern Africa, with a molecular phylogeny of related Meligethinae

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The pollen beetle *Tarchonanthopria freidbergi* gen. nov., sp. nov., from SW Kenya, Rift Valley, is described and illustrated. The taxonomic and phylogenetic position of *Tarchonanthopria* is discussed using evidence from a preliminary molecular analysis of the new genus and a group of related genera, as well as results from a companion paper implementing a morphological cladistic analysis of all 47 extant and fossil Meligethinae genera. Morphological data suggest a taxonomic position of the new genus near the speciose Palaeotropical genus *Pria* Stephens, 1830, whereas molecular data suggest a closer relationship with the African genus *Micropria* Grouvelle, 1899. Larval host-plants of the single known species of the new genus are male inflorescences of Asteraceae trees in the genus *Tarchonanthus* Linnaeus, 1753. *Tarchonanthopria freidbergi* does not exhibit any close phylogenetic relationships with other Afrotropical meligethine genera associated with Asteraceae Tarchonanthae (i.e. members of the African ‘*Anthystris* genus-complex’). A table is presented summarizing all available data on Meligethinae larval–host plant relationships.

<http://zoobank.org/urn:lsid:zoobank.org:act:AFC89330-3FA8-46E5-A8E5-2ADCB6D5A57D>

Key words: Asteraceae, host-plants, Kenya, molecular analysis, new genus, new species, pollen-beetles, *Tarchonanthopria freidbergi*

Introduction

Meligethinae are commonly known as ‘pollen beetles’. Their larval development occurs in budding flowers of monocots and dicots. Some taxa are of economic importance as feeders, pests and pollinators of widely cultivated crops such as several mustard-oil plants (Brassicaceae), grass-clover and lucerne (Fabaceae), oil palms (Arecaceae), and bulrush millet (Poaceae) (Jourdeuil, 1957; Hatch, 1957; Kelm, 1976; Kirk-Spriggs, 1985, 1996;

Jelínek, 1992; Audisio, 1993; Howard *et al.*, 2001; Hansen, 2003); whereas others are known pests of ornamental plants such as roses and blackberries (Rosaceae) (Ormerod, 1874; Hayashi, 1978; Audisio, 1993).

Meligethinae (Audisio *et al.*, 2009a) includes some 650 described species, attributed to at least 46 extant genera, widely distributed mainly in the Afrotropical and Palae-arctic Regions, with only marginal presence in Oriental and Nearctic Regions and in Oceania. The subfamily is not represented in the Neotropics.

This subfamily represents a monophyletic lineage among Nitidulidae, being most closely related to

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Nitidulinae (Kirejtshuk, 1992, 1997; Audisio, 1993; Kirejtshuk & Kirejtshuk, 2012). The primary features of Meligethinae are represented by: labrum distinctly free (never fused with frons); procoxal cavities distinctly closed; elytra never serially longitudinally punctate and/or ciliate; at most the pygidium may be exposed, but other abdominal tergites are always covered by elytra; posterior base of pronotum simple, never bordered by a barely impressed transverse line; a simple (never distinctly double) row of spinules along the outer edge of the meso and metatibiae; meso and metatibiae markedly flattened; base of pygidium (under elytral apex) with a small median protuberance, delimited on each side by a large and shallow arc-like impression; labium exhibiting on each distal side long and pointed, sickle-shaped paraglossae; protibiae with a series of more or less developed teeth, separated from each other by minute triangular or subcylindrical spicules; male tegminal paramera separated from each other at least in distal portion; larvae without distinctly projected and lobed urogomphi; larvae with mandibles never exhibiting a multilobed or fringed prostecha, and always with distinct basal mola; larvae with distinct and well-developed adhesive arolium at apex of each tarsungulus.

The current classification of the Nitidulid subfamily Meligethinae follows the results of a preliminary reexamination of the genus-level taxonomy (using morphological data) recently presented by Audisio *et al.* (2009a). Recent comments and taxonomic proposals of Kirejtshuk & Kirejtshuk (2012), mostly based on unsupported conclusions, will be discussed elsewhere. However, further analyses are needed to better define the limits and the true monophyly of some genera, chiefly in the numerous taxa previously attributed to the polyphyletic ‘old’ genus *Meligethes* (s.l.).

In a companion paper (Audisio *et al.*, unpubl), a phylogeny was reconstructed based on 280 species of the 47 known extant and fossil meligethine genera (Table 3), and on two nitiduline and epuraeine outgroups, using 85 morphological characters of adults (both external and genitalic structures). Results indicate that the subfamily is strictly monophyletic, and includes two main clades: one grouping contains *Meligethes*, *Meligethinus*, *Chromogethes* and allied genera, plus the *Pria* complex of genera. The other grouping possesses all other genera. A few genera (i.e. the Oriental *Cryptarchopria*, and a couple of closely related additional genera, the Oriental and African *Kabakovia* and the Oriental *Horakia*, both recently tentatively downgraded to subgenera of *Cryptarchopria* by Kirejtshuk & Kirejtshuk, 2012, apparently occupy together a more isolated position outside the two major clades, although sister to the first clade cited above.

The *Pria* complex of genera is characterized by: dorso-ventrally depressed and elongate body, usually unicoloured ochraceous; male paramera deeply separated from each other by a wide V-shaped or U-shaped excision; male median lobe of the aedeagus usually arcuately and

shallowly emarginated at the apex; female ovipositor with long gonostyloids exhibiting peculiarly long cylindrical styli. This complex includes the mostly Afrotropical genera *Pria*, *Palmopria*, *Microporodes*, *Cornutopria*, *Lechanturia*, *Lucanopria*, *Microporum* and *Microporellus*. Our unpublished morphological analyses clearly suggest that phylogenetic placement of *Tarchonanthopria* gen. nov. is within this clade.

After the Audisio *et al.* (2009a) article, an additional new genus, *Restiopria* Audisio, Jelínek & Cline, 2011, was recently described from South Africa (Audisio *et al.*, 2011), and a new fossil genus (Kirejtshuk, 2011), based on *Melipriopsis rasnitsyni* from Eocene Baltic Amber (dated around 40–50 Ma), was attributed to Meligethinae (despite certain doubts; e.g. this taxon exhibits a distinctly bordered posterior pronotal base, and a markedly reduced ‘axillary space’ on metaventrite, two features that are not consistent with the current delimitation of the subfamily).

Given this scenario, a new meligethine genus (and species) was discovered by author PA in southwestern Kenya during a recent (I/II.2011) fieldtrip to Central and Eastern Africa. The taxon appeared peculiar in possessing an apparently intermediate set of morphological characters between most members of the *Pria* genus-complex and certain distant genera previously embedded in the ‘genus’ *Meligethes*, e.g. of the genera *Lamiogethes* Audisio & Cline, 2009 and *Afrogethes* Audisio & Cline, 2009. This odd combination of characters created a potentially ambiguous taxonomical placement of the new species (see Differential Diagnosis below). This paper describes this new eastern African taxon as *Tarchonanthopria freidbergi* gen. nov., sp. nov., and shortly discusses its phylogenetic position within Meligethinae, as inferred from available morphological, molecular and ecological data. The present paper forms part of an upcoming revision of the entire subfamily Meligethinae (Audisio *et al.*, unpubl data).

Materials and methods

Depositories

The new genus and species described herein were collected during a recent fieldtrip to Kenya and Burundi (I/II.2011) organized by the Department of Biology and Biotechnologies of Sapienza Rome University, Italy, and the Department of Zoology at Tel Aviv University, Israel. The material investigated is preserved in P. Audisio’s collection, housed at the Zoological Museum, Sapienza Rome University (MZUR-CAR), in the National Museum of Kenya, Nairobi (NMKN), in the Transvaal Museum, Pretoria (TMSA), in the National Museum (Natural History), Prague, Czech Republic (NMPC), and in A.R. Cline’s Collection, housed at the California State Collection of Arthropods, USA (CSCA). Other comparative material has been borrowed for study from several South

African institutions, including the National Collection of Insects, Plant Protection Institute, Pretoria (SANC), the Iziko Museum, Cape Town (SAMC), and the National Museum, Bloemfontein (BMSA). Undetermined material and type material of previously described species of African Meligethinae were made available for study by the Muséum National d'Histoire Naturelle, Paris (MNHN), by the Natural History Museum, London, UK (BMNH), by the Muséum Royal de l'Afrique Centrale, Tervuren, Belgium (MRAC), and by the Institut Royal des Sciences Naturelles de Belgique, Bruxelles, Belgium (ISNB).

Examination of morphology

Terminology follows Jelínek (1975, 2000), Audisio (1993), Audisio *et al.* (2009a, 2009b), Jelínek *et al.* (2010) and Kirejtshuk (2011). Total length of specimens is defined as the distance between anterior margin of clypeus and posterior apex of pygidium. Maximum width of body is defined as the maximum (combined) width of elytra.

Most studied characters involving measurements of external body shape were analysed using a digital camera mounted on a MZ8 WILD® stereomicroscope (40–80×), and the image processing software package WINVISION® (Delta Sistemi®, Rome); drawings were made with a drawing tube mounted on the same stereomicroscope, and some measurements were taken with an ocular-micrometer mounted on the same stereomicroscope. Measurements of mouth parts, tarsal, antennal, and genitalic characters were made using the same device/software as well as from accurate drawings made with a drawing tube mounted on a BX50 OLYMPUS® upright microscope (magnification = 200–1000×). SEM images were acquired at the Department of Environmental Sciences, University of L'Aquila, Italy, using a Hitachi® model 1000 SEM under variable pressure conditions (150–2000×).

DNA extraction and sequencing

We sampled a few genera (where fresh material was available) from each of the two main Meligethinae clades cited above in the Introduction. In addition, the Oriental genus *Cryptarchopria* and the new genus described herein were also included in the analyses.

Specimens were collected and preserved in 96% ethanol or pure acetone. DNA was extracted from whole specimens by the DNeasy Tissue Kit (Qiagen GmbH, Hilden, Germany) or by a standard phenol–chloroform extraction. Vouchers and DNA samples are kept in PA's collection at the Department of Biology and Biotechnologies 'C. Darwin', Sapienza University (MZUR-CAR, Rome).

We amplified and sequenced five gene-regions: one mitochondrial (3' end of large ribosomal unit plus the leucine tRNA and the 5' end of NADH dehydrogenase subunit

1 [*rrnL*+*trnL*+*nadI*]; see Table 2 for primers); two nuclear (the Phosphoenolpyruvate Carboxykinase [PEPCK] and the ribosomal Internal Transcribed Spacer 2 [ITS2]; see Table 2 for primers). For 12 of the 17 Meligethinae taxa analysed, ITS2 sequences were already available (Trizzino *et al.* 2009), and the remaining five specimens (Table 1) were sequenced for the first time. Table 1 illustrates, for each species, whether gene fragments have been sequenced *ex-novo* or downloaded from GenBank.

Amplifications were performed using the following PCR conditions: initial denaturation at 95°C for 5 min, followed by 33–38 cycles of denaturation at 94°C for 1 min, annealing at 47°–58°C for 30 s, 1-min extension at 72°C and a last 7-min elongation step at 72°C. Reactions were performed in a 25 µl volume containing (NH₄)₂SO₄ 16 mM, Tris–HCl 67 mM (pH 8.8 at 25°C), MgCl₂ 3 mM, 1 mM of each dNTP, 0.8 pmol of each primer and 1.25 units of Taq DNA polymerase (Platinum® Taq DNA Polymerase, Invitrogen). The amplified products were purified with EXOSAP-IT enzymatic reactions (USB Corporation, USA) or simply precipitated in ethanol, and subsequently sent to an external sequencing service (BMR Genomics, Padua, Italy or Macrogen Europe).

Sequences were assembled and edited with Geneious® software ver. 4.8.4 (Biomatters Ltd.). New sequences are deposited in GenBank (accession numbers from KC538906 to KC538938). Only nuclear markers were sequenced for species of *Micropria* and *Cryptarchopria*; in fact, sequencing of mitochondrial markers of these taxa was tried nearly one year later than nuclear markers, and this process failed probably due to non-optimal preservation of the available DNA during such period (and we unfortunately lack other specimens for these species).

Molecular phylogenetic analyses

To test the actual phylogenetic position of the new genus in the context of the morphologically related genera of Meligethinae, we performed a preliminary molecular analysis using available material of a series of taxa within Meligethinae (Table 1), which was based on results from our morphological cladistic analysis discussed in the Introduction. This resulted to be the most closely [*Meligethinus*, *Brassicogethes*, *Meligethes*, *Chromogethes*, *Sebastiangethes*, *Xenostromylogethes*, *Tarchonanthogethes*, *Anthystrix*] or the most distantly related [*Acanthogethes*, *Sagittogethes*, *Afrogethes*] to *Pria* and allied genera.

The final data matrix of our preliminary phylogenetic analysis (Table 1) included 18 terminals (17 ingroup taxa belonging to 15 genera of Meligethinae and 1 outgroup taxon) and 1940 aligned nucleotides (mtDNA fragment = 815 bp; ITS2 = 581 bp; PEPCK = 544 bp). Pending a comparable series of sequences for the same five gene fragments here analysed (see above) in other Nitidulidae, as well as in other more closely related beetle families, the

Table 1. Genetically analysed specimens

Species (with specimen ID)	Geographic locality	<i>Ex novo</i> sequenced genes, with acc. num.	Downloaded from Genbank
<i>Acanthogethes hercules</i> HR1_1	Spain, Canary Islands, Tenerife, La Guancha	(rrnL+trnL+nad1): KC538920	ITS2: EU716252
<i>Afrogethes fruticola</i> FR3_1	South Africa, Western Cape, Cape Town, Table Mountain, Tafelberg Road	(rrnL+trnL+nad1), PEPCK: KC538922; KC538927	ITS2: EU716271
<i>Anthystrix longiclava</i> AL1_1	South Africa, Eastern Cape, road to Gamtoosriviermond	(rrnL+trnL+nad1), PEPCK: KC538911; KC538930	ITS2: EU716294
<i>Brassicogethes aeneus</i> AN_43_3	Greece, Mount Olympos, road Litochoron to Leptokaria	(rrnL+trnL+nad1), PEPCK: KC538915; KC538936	ITS2: EU716256
<i>Chromogethes</i> <i>splendidulus</i> SN1_1	South Africa, Western Cape, road Plettenberg Bay to Avontour	(rrnL+trnL+nad1), PEPCK: KC538914; KC538928	ITS2: EU716297
<i>Cryptarchopria</i> <i>ponomarenkoi</i> CP1_1	Thailand, Mai Hong Son province, Soppong	PEPCK, ITS2: KC538937; KC538910	/
<i>Meligethes atratus</i> AS1_1	Italy, Lazio, Rieti Province, Mount Terminillo, Campoforogna	(rrnL+trnL+nad1), PEPCK: KC538917; KC538934	ITS2: EU716223
<i>Meligethes denticulatus</i> DN1_1	Romania, road E68 to Zarnesti, 5 km NW of Zarnesti	(rrnL+trnL+nad1), PEPCK: KC538918; KC538935	ITS2: EU716237
<i>Meligethinus pallidulus</i> PD2_1	Italy, Lazio, Rome, Appia Nuova road, Quarto Miglio	(rrnL+trnL+nad1), PEPCK: KC538916; KC538933	ITS2: EU716270
<i>Micropria</i> sp. cfr. <i>perparva</i> 1	Burundi, Kayanza Province, Kibira National Park	PEPCK, ITS2: KC538925; KC538908	/
<i>Micropria</i> sp. cfr. <i>perparva</i> 2	Burundi, Muyinga Province, Ruvubu National Park	ITS2: KC538909	/
<i>Pria cinerascens</i> PI1_1	South Africa, Western Cape Du Toits Kloof, N slope	(rrnL+trnL+nad1), PEPCK, ITS2: KC538919; KC538938; KC538907	/
<i>Sagittogethes umbrosus</i> UM1_1	Italy, Lazio, Rieti Province, Mount Terminillo, Campoforogna	(rrnL+trnL+nad1): KC538921	ITS2: EU716263
<i>Sebastiangethes</i> <i>anthystrixoides</i> SS2_1	South Africa, Northern Cape, road Kuruman to Dingleton, river Ga-Magere	(rrnL+trnL+nad1), PEPCK: KC538913; KC538931	ITS2: EU716304
<i>Tarchonanthogethes</i> sp.	South Africa, Northern Cape, 12 Km N of Kuruman	(rrnL+trnL+nad1), PEPCK: KC538923; KC538929	ITS2: EU716295
<i>Tarchonanthopria</i> <i>freidbergi</i> M1	Republic of Kenya, Rift Valley Province, national road Nairobi to Nakuru, 25 Km SE Nakuru, near Gilgil	(rrnL+trnL+nad1), PEPCK, ITS2: KC538924; KC538926; KC538906	/
<i>Xenostromylogethes</i> <i>luculentus</i> LU1_1	South Africa, Western Cape, Meeringspoort, N of De Rust	(rrnL+trnL+nad1), PEPCK: KC538912; KC538932	ITS2: EU716303

previously published sequences of the Carabid species *Pamborus alternans* Latreille, 1817 (GenBank accession numbers AY847537–AY723150) were selected as the outgroup.

Sequences were aligned with the online version of MAFFT v.6 using the G–INS–i algorithm and default parameters (Kato & Toh, 2008). Introns within the PEPCK sequences were removed based on the CDS (Coding DNA Sequence) of sequences of related taxa already

available in GenBank (Coleoptera, Curculionidae). Gaps were considered as ‘missing-data’. The best fitting model to analyse each partition was selected by jModelTest (Posada, 2008) using the Akaike Information Criterion (AIC). The selected evolutionary model was GTR+G for all the mitochondrial markers and for ITS2, whereas HKY+G was selected for PEPCK.

Bayesian analysis (BI) was conducted, with default set of priors, on a combined data matrix with MrBayes 3.1.2

Table 2. Used primers

Primer ID	Primer sequence (5′–3′)	Fragment	Reference
16sAR (F)	CGCCTGTTTA(A/T)CAAAAACAT	<i>rrnL+trnL+nad1</i>	Simon et al. 1994
ND1A (R)	GGTCCCTTACGAATTTGAATATATCCT	<i>rrnL+trnL+nad1</i>	Simon et al. 1994
ITS-3D (F)	GCATCGATGAAGAACGCAG	ITS2	Oliverio & Mariottini 2001
ITS-4R (R)	AGTTTCTTTTCCTCCGCTTA	ITS2	Oliverio & Mariottini 2001
PEPCK-F1(F)	AGTGGARTGTGTGTTGGRGACGATAT	PEPCK	Downie et al. 2008
PEPCK-R1(R)	CGAAGAAGGGCKCATWGCAG	PEPCK	Downie et al. 2008

Table 3. Host plants of World Meligethinae genera

Genus	Botanical Class	Family/ies	Tribe(s) (if relevant)	Genera/Species
<i>Acanthogethes</i> Reitter, 1871	Dicots	Cistaceae		<i>Cistus</i> spp., <i>Halimium</i> spp., <i>Helianthemum</i> spp., and allies
<i>Afrogethes</i> Audisio & Cline, 2009	Dicots (*)	Fabaceae, Polygalaceae, Boraginaceae, Verbenaceae, Poaceae (*)		several
<i>Anthystrix</i> Kirejtshuk, 1981	Dicots	Asteraceae	Tarchonantheae	<i>Tarchonanthus</i> spp.
<i>Aristogethes</i> Audisio & Cline, 2009	Dicots	Sterculiaceae		<i>Hermannia</i> spp.
<i>Asterogethes</i> Audisio & Cline, 2009	Dicots	Asteraceae	Arctotidinae, Calenduleae	<i>Arctotis</i> spp., <i>Osteospermum</i> spp., <i>Dimorphoteca</i> spp., and allies
<i>Astylogethes</i> Kirejtshuk, 1992	Dicots	Campanulaceae		<i>Campanula</i> spp., <i>Jasione</i> spp., and allies
<i>Bolbocerogethes</i> Audisio & Cline, 2009	Dicots (?)	unknown; adults collected once on small Fabaceae		
<i>Boragogethes</i> Audisio & Cline, 2009	Dicots	Boraginaceae		<i>Symphytum</i> spp., <i>Anchusa</i> spp.
<i>Brassicogethes</i> Audisio & Cline, 2009	Dicots	Brassicaceae (including Capparaceae)	several	several; mostly <i>Brassica</i> spp., <i>Cardamine</i> spp., <i>Arabis</i> spp., <i>Lunaria</i> spp., <i>Hesperis</i> spp., <i>Matthiola</i> spp., and allies
<i>Chromogethes</i> Kirejtshuk, 1989	Dicots	Asteraceae	Inuleae, Senecioneae, Gnaphalieae	<i>Helichrysum</i> spp., <i>Senecio</i> spp., <i>Metalasia</i> spp., and allies
<i>Cornutopria</i> S.Endrödy-Younga, 1978	Monocots (?)	unknown		unknown
<i>Cryptarchopria</i> S.Endrödy-Younga, 1978	Monocots	Arecaceae		<i>Areca catechu</i> L., <i>Arenga</i> spp., <i>Caryota mitis</i> Lour.
<i>Cyclogethes</i> Kirejtshuk, 1979	Dicots (?)	unknown		unknown
<i>Fabogethes</i> Audisio & Cline, 2009	Dicots	Fabaceae		<i>Trifolium</i> spp., <i>Ononis</i> spp., <i>Onobrychis</i> spp., and allies
<i>Genistogethes</i> Audisio & Cline, 2009	Dicots	Fabaceae		<i>Genista</i> spp., <i>Cytisus</i> spp., <i>Coronilla</i> spp., <i>Lotus</i> spp., and allies
<i>Horakia</i> Jelínek, 2000	Monocots	Arecaceae		<i>Caryota gigas</i> W.J. Hahn ex Hodel. ?
<i>Idiogethes</i> Kirejtshuk, 1977	Dicots	Boraginaceae		<i>Heliotropium</i> spp.
<i>Indogethes</i> Audisio & Cline, 2009	Dicots (?)	unknown		
<i>Jelinekgethes</i> Audisio & Cline, 2009	Dicots	Montiniaceae (?)		<i>Montinia caryophyllacea</i> Thunb. ?
<i>Kabakovia</i> Kirejtshuk, 1979	Monocots	Arecaceae		<i>Phoenix humilis</i> Royle and others
<i>Lamiogethes</i> Audisio & Cline, 2009	Dicots	Lamiaceae (also Euphorbiaceae ?; **)		several
<i>Lariopsis</i> Kirejtshuk, 1989	Dicots	Asteraceae	Arctotidinae	<i>Arctotis</i> spp., <i>Arctotheca</i> spp., and allies
<i>Lechanteuria</i> S.Endrödy-Younga, 1978	Dicots (?)	Moraceae (?)		adults collected once on <i>Treculia</i> sp.
<i>Lucanopria</i> Audisio & Cline, 2009	Dicots (?)	Meliaceae (?)		adults collected once on <i>Carapa grandiflora</i> Sprague
<i>Meligethes</i> Stephens, 1830	Dicots	Rosaceae		<i>Rosa</i> spp., <i>Rubus</i> spp., and allies
<i>Meligethinus</i> Grouvelle, 1906	Monocots	Arecaceae		several species of the genera <i>Chamaerops</i> , <i>Nanorrhops</i> , <i>Elaeis</i> , <i>Raphia</i> , and allies
<i>Microporellus</i> S.Endrödy-Younga, 1978	Monocots	Pandanaceae (?)		<i>Pandanus</i> spp. (?)
<i>Microporodes</i> S.Endrödy-Younga, 1978	Monocots	Arecaceae		<i>Elaeis guineensis</i> Jacq.
<i>Microporum</i> C.Waterhouse, 1876	Monocots	Pandanaceae		<i>Pandanus</i> spp.
<i>Micropria</i> Grouvelle, 1899	Dicots	Euphorbiaceae (***)		<i>Macaranga</i> spp. (***)

(continued)

Table 3. (Continued)

Genus	Botanical Class	Family/ies	Tribe(s) (if relevant)	Genera/Species
<i>Neolariopsis</i> Audisio & Cline, 2009	Dicots	Mesembryanthemaceae (including Aizoaceae)		several
<i>Odontholariopsis</i> Audisio & Cline, 2009	Dicots	Mesembryanthemaceae		several
<i>Paleogethes</i> Audisio & Cline, 2009	Dicots	Boraginaceae		<i>Ceballosia fruticosa</i> (L.f.) G.Kunkel
<i>Palmopria</i> S.Endrödy-Younga, 1978	Monocots	Arecaceae		<i>Elaeis guineensis</i> Jacq.
<i>Pria</i> Stephens, 1830	Dicots	different and unrelated families, such as Solanaceae, Ericaceae, Mesembryanthemaceae, Asteraceae, and others		several
<i>Restiopria</i> Audisio & Cline, 2011	Monocots	Restionaceae		so far not identified with certainty; <i>Antochortus</i> spp. and allies
<i>Rubiogethes</i> Audisio & Cline, 2009	Dicots	Rubiaceae		<i>Pentas</i> spp., <i>Pentanisia</i> spp., and allies
<i>Sagittogethes</i> Audisio & Cline, 2009	Dicots	Lamiaceae		<i>Prunella</i> spp., <i>Salvia</i> spp., <i>Dracocephalum</i> spp., <i>Teucrium</i> spp., and allies
<i>Sebastiangethes</i> Audisio, Kirk Spriggs & Cline, 2008	Dicots	Asteraceae	Tarchonantheae	<i>Tarchonanthus camphoratus</i> L.
<i>Stachygethes</i> Audisio & Cline, 2009	Dicots	Lamiaceae		<i>Stachys</i> spp., <i>Salvia</i> spp., <i>Ballota</i> spp., <i>Marrubium</i> spp., and allies
<i>Tarchonanthogethes</i> Audisio & Cline, 2009	Dicots	Asteraceae	Tarchonantheae	<i>Tarchonanthus</i> spp., <i>Brachylaena</i> spp.
<i>Tarchonanthopria</i> Audisio & Cline, h.o.	Dicots	Asteraceae	Tarchonantheae	<i>Tarchonanthus camphoratus</i> L.
<i>Thymogethes</i> Audisio & Cline, 2009	Dicots	Lamiaceae		<i>Mentha</i> spp., <i>Thymus</i> spp., <i>Lavandula</i> spp., <i>Dracocephalum</i> spp., and allies
<i>Xenostromylogethes</i> Audisio & Cline, 2009	Dicots	Asteraceae	Tarchonantheae	<i>Tarchonanthus</i> spp.
<i>Xerogethes</i> Audisio & Cline, 2009	Dicots	Brassicaceae		<i>Sisymbrium</i> spp., <i>Erysimum</i> spp., and allies

Larval rearing records from flower buds are presented if data were confirmed. Uncertain data are marked with “?”. Genera are listed in alphabetical order. (*) “*Meligethes*” *heteropus* Gerstaecker 1871 from tropical Africa, which has uncertain generic placement, is tentatively placed here near *Afrogethes*, and is known to be associated with Poaceae (Kirk-Spriggs, 1985)

(**) One recently described species of *Lamiogethes* from Yemen (Socotra Island), and a few allied species from southern India, are suspected (Audisio, 2012) to be associated as larvae to Euphorbiaceae of the genus *Cephalocroton* Hochst. and allied genera.

(***) Adults and larvae of *Micropria* spp. were recently collected in montane tropical forests in N Burundi, January 2011, on male inflorescences of *Macaranga* spp. (Euphorbiaceae) (Audisio & McPherson, unpublished data)

(Huelsenbeck & Ronquist, 2001), using five partitions corresponding to the five molecular markers, with all parameters linked across partitions. MrBayes (2 chains) was run for 10×10^6 generations. ‘Burn-in’ values were established after visual examination of convergence monitoring plot. Convergence between runs was assessed with Tracer v1.5. Convergence was reached after 9.35×10^5 generations.

Results

Taxonomy

Tarchonanthopria Audisio & Cline, gen. nov.

Figs 1–23

Type species. *Tarchonanthopria freidbergi* Audisio & Cline, sp. nov.

Etymology. The generic name is derived from two sources. The first part is from the plant genus name *Tarchonanthus* Linnaeus, 1753 (Asteraceae), which is the host-plant for the type species (see below); and the second part for the related meligethine genus *Pria* Stephens 1830. Gender feminine.

Differential diagnosis. *Tarchonanthopria* Audisio & Cline, gen. nov., is differentiated from the more closely related taxa of the *Pria* genus-complex by the following characters, each of them representing a putative

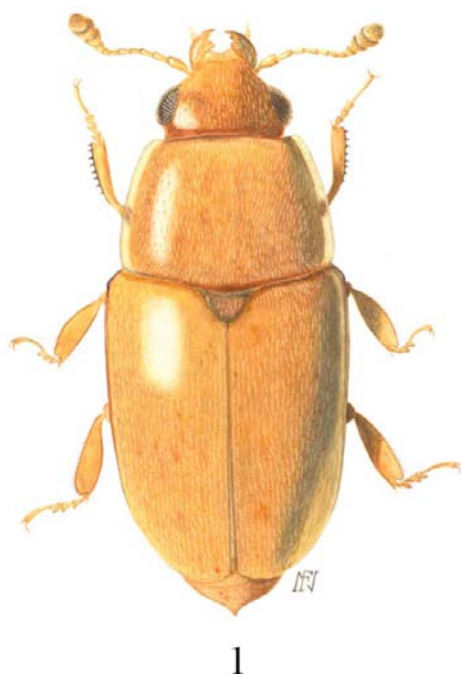


Fig. 1. Habitus of *Tarchonanthopria freidbergi* gen. nov., sp. nov. (male paratype from Kenya, 25 km SE Nakuru). Length: 1.6 mm.

apomorphic condition absent in all other Meligethinae of the '*Pria* genus-complex' (Audisio, 1993; Audisio *et al.*, 2009a, 2011; Audisio & Cline, unpubl data): (1) peculiarly shaped protibiae (minute, narrow, the whole outer edge armed with a few large, serrate, subequal teeth, each of them being markedly darkened distad, in their shape recalling a condition present in certain species of the unrelated genera *Lamiogethes* and *Afrogethes*; see Figs 1, 2, 22); (2) exceedingly long and narrow protarsi in dorsal view (Fig. 1); (3) transversely convex but narrowed and trapezoid-like pronotum (Fig. 1). Additional putative autapomorphic conditions absent in this form in all other known Meligethinae are: (4) head with small punctures, each being nearly $3\times$ smaller than eye facet (Fig. 22), and nearly unpunctured pronotum, scutellum and elytra (Figs 20, 22; punctures $\approx 4\times$ smaller than eye facet, and even smaller than diameter of each inserted seta, which are narrowed at their basis; the minute and shallow punctures are then visible only when setae are removed); (5) two large, symmetrical medial pits bearing tufts of setae on the mentum (Fig. 18). This condition is absent in all other Meligethinae except for *Micropria* Grouvelle, 1899, and *Cornutopria* S. Endrödy-Younga, 1978, where location and number of tufts are nevertheless different.

Description

Additional characters of the new genus are represented by: elytral humeral striae absent; elytral pre-sutural striae

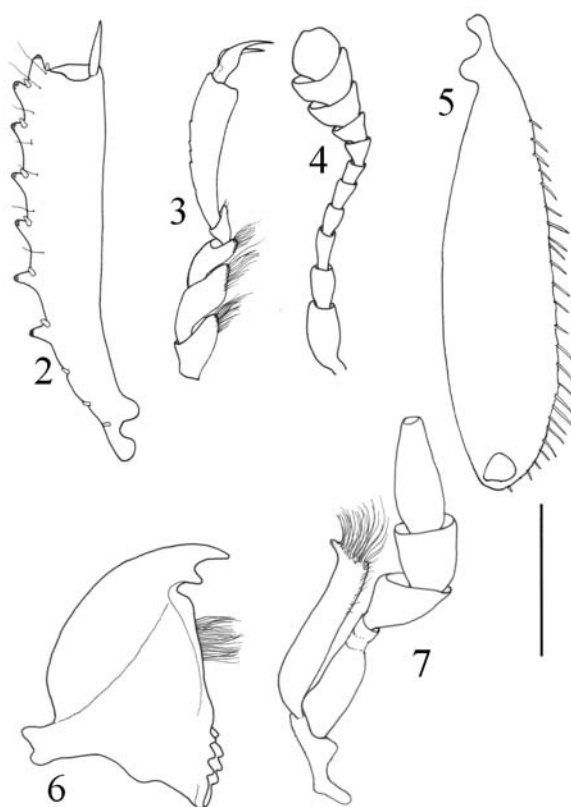


Fig. 2-7. *Tarchonanthopria freidbergi* gen. nov., sp. nov. (male paratype from Kenya, 25 km SE Nakuru); 2, left protibia; 3, left protarsus; 4, right antenna; 5, right metatibia; 6, left mandible; 7, right maxilla and maxillary palpus. Scale bar represents: Figs 2-3, 5-7, 0.1 mm; Fig. 4, 0.20 mm.

barely distinct anteriorly, terminating nearly at elytral apex, and delimiting, on each elytron, a faintly distinct, flat, relatively wide unraised sutural border, in middle nearly as wide as proximal width of 2nd antennomere, narrowed posteriorly; large arcuate lateral impressions on proximal portion of pygidium with a peculiarly sclerotized and dark appearance that markedly contrasts with the pale yellow pygidial colour (Fig. 17); short, minute antennae, with reduced sexual dimorphism (antennal club composed by the last three antennal joints in both sexes, but in males the eighth joint being distinctly larger and wider than in females: Figs 1, 4); pronotal and elytral sides narrowly flattened, and partly translucent (Fig. 1). All these characters are in conjunction with a series of putative symplesiomorphous traits, shared with *Pria* and with most members of the so-called '*Pria* genus-complex', such as: simple *Pria*-like hypopygidium that lacks arcuate lateral impressions; proximal portion of pygidium (obscured under elytral apices) in both sexes with inner apices of the peculiarly large basal arched impressions fused medially, forming a short blunt bulge (Fig. 17); *Pria*-like pale yellow general appearance (Fig. 1); relatively simple and *Pria*-like male and female genitalia

(Figs 9–13; male genitalia without processes along inner side of parameres, separated by a deep, V-shaped incision, and without deep median longitudinal desclerotization from proximal portion of tegmen extending to medial distal V-shaped excision; apex of paramera simple, terminal setae elongate, denticulations absent; median lobe of aedeagus relatively long and parallel-sided, slightly arcuately emarginate distally; main sclerites of aedeagal internal sac/flagellum/large-sized and apically acute; ovipositor relatively large but slender, bearing long, symmetrical and cylindrical styli; each gonostyloid not heavily sclerotized and pigmented distally, with a simple, never indentate outer portion of basicoxites, and a single, small and narrow, faintly pigmented and sclerotized arcuate area along outer subdistal portion of gonostyloids; simple prosternal anterior margin, lacking any raised propisternal-prosternal suture, then prosternal antennal furrows on anterior margin of prosternum absent (Figs 8, 19); labrum wide with anterior margin widely and deeply incised medially; simple circum-ocular dorsal area, lacking any periocular grooves (Figs 1, 22); frons without tentorial dorsal impressions; antennal furrows on ventral side of the head shallow, moderately convergent posteriorly, ending in a C-shaped shallow and ill-defined postocular impression (Fig. 19); normally shaped, widely arcuately caudal marginal lines of mesocoxae (on metaventrite), limiting a very large and widely obtuse 'axillary angle', outer 'axillary' line broadly curving posterolaterally like in almost all Meligethinae except a few species of the genus *Meligethinus* Grouvelle (where the 'axillary angle' is more acute); small axillary space on the first abdominal ventrite (Fig. 14); prosternal process relatively narrow, subapical portion dilated, 2.3–3.0× as wide as maximum width of 1st antennomere, apex obtuse (Fig. 8); lateral borders of prosternal process delimiting shallowly impressed and barely distinct furrows, distally terminating over predistal lateral expansions, approximating prosternal posterior margin; posterior margin of metaventrite between metacoxae simple, straight, not medially incised; caudal marginal lines of metacoxal cavities simple, parallel and narrowly contiguous to posterior margin of metacoxal cavities, with moderately distinct arched impressions of outer 'axillary' line curving posterolaterally (Fig. 14); labial palpi moderately long in both sexes, terminal segment ~1.7× as long as wide (Fig. 18); maxillary palpi long and slender in both sexes, terminal segment ~2.2× as long as wide (Figs 7, 18); mandible mid-sized, apex bilobed and acuminate, retinaculum moderately prominent on inner side, molar region prominent with rows of small acute projections (Fig. 6), no sexual dimorphism; tarsal claws simple, not toothed at base (Fig. 3); meso- and metatibiae without U-shaped sinuosity at distal third, lateral margin bearing a single even row of fine, long pegs; meso- and metatibiae long, slender and narrow (Figs 1, 5); anterior margin of profemora simple in

both sexes, without tubercles or projections; posterior margin of metafemora simple in both sexes, without tubercles or projections; moderately arcuately emarginated anterior edge of the clypeus not bordered, simple (without any medial bulge), and with almost right outer angles (Fig. 1). The single, peculiarly small, inclusive species varies slightly in length (1.3–1.6 mm), and share with species of the genus *Pria* most of the main taxonomic characters, except the diagnostic traits listed above.

Geographic distribution. *Tarchonanthopria* gen. nov. currently includes the single type species from southwestern Kenya described below.

Tarchonanthopria freidbergi Audisio & Cline, sp. nov.

Figs 1–23

Holotype. Male; Republic of Kenya, Rift Valley Province, national road Nairobi–Nakuru, approximately 25 km SE Nakuru, near Gilgil (savannah), 00°33'08.8"S, 36°20'51.8"E, 1950 m a.s.l., 9.ii.2011, male inflorescences (capitula) of *Tarchonanthus camphoratus* L. (Asteraceae), P. Audisio, M. Mei and P. Cerretti leg. (NMKN).

Paratypes. 6 males, 13 females, same data as holotype (MZUR-CAR, NMP, CAS, SAMC); 1 male, 8 females: Republic of Kenya, Rift Valley Province, national road Nairobi–Nakuru (disturbed savannah), approximately 45 km SE Nakuru, 00°46'01.2"S, 36°29'47.7"E, 2100 m a.s.l., 6.ii.2011, male inflorescences of *Tarchonanthus camphoratus* L. (Asteraceae), P. Audisio and A. Freidberg leg.

Type locality. Republic of Kenya, Rift Valley Province, approximately 25 km SE Nakuru, near Gilgil.

Etymology. This species is named after our friend and colleague, Amnon Freidberg (Dept. of Zoology, Tel Aviv University, Israel), renowned specialist in Diptera Tephritidae, a group of flies whose lifestyle exhibits many similarities with Meligethinae (see, e.g. De Meyer & Freidberg, 2005). Amnon additionally contributed to the collection of the new species in Kenya, where a few years ago in the same localities on the same host-plants *Tarchonanthus coleoprata* Freidberg and Kaplan, 1993, a new species and genus of fruit flies (Freidberg & Kaplan, 1993), was discovered.

Description

In addition to the characters provided in the description of the genus, the new species can be characterized as follows:

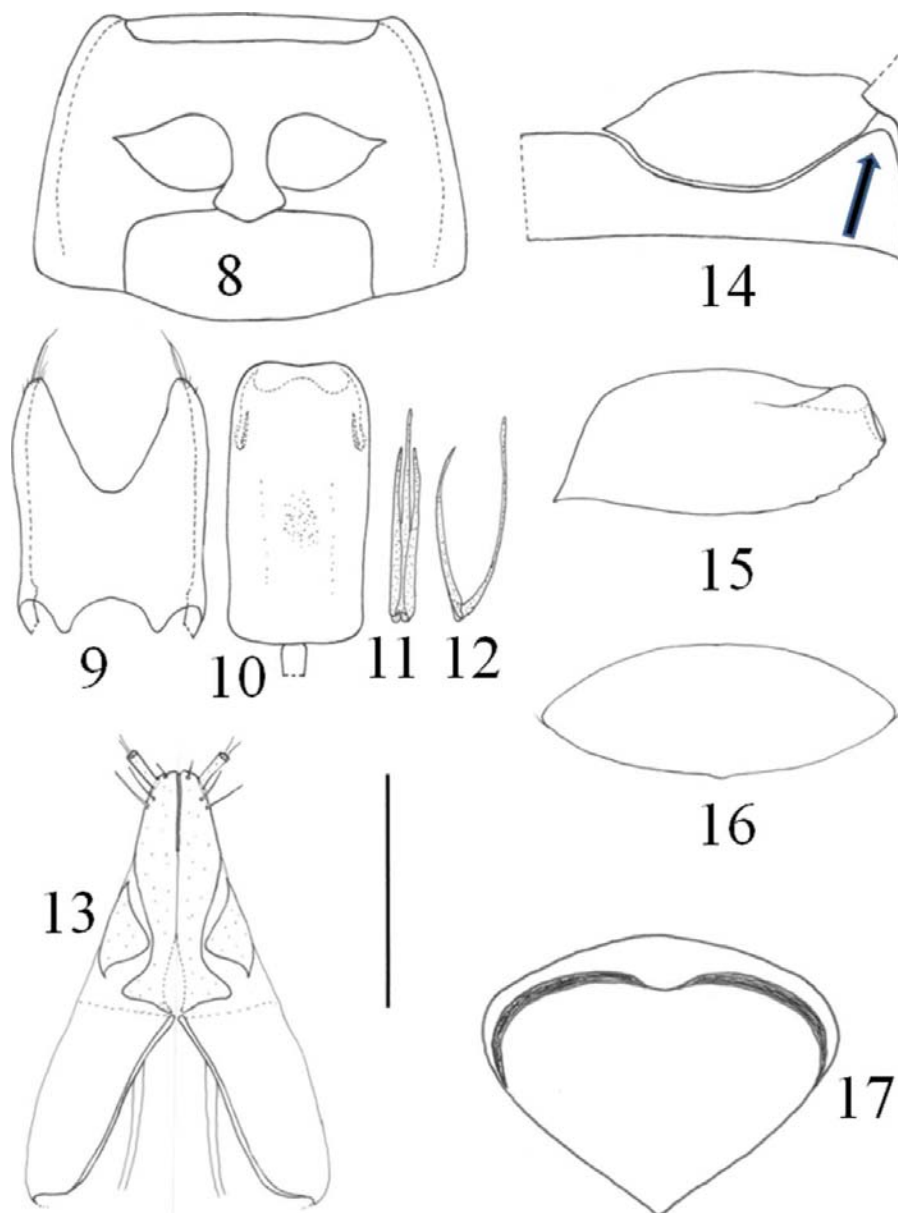


Fig. 8–17. *Tarchonanthopria freidbergi* gen. nov., sp. nov. (male paratype and female paratypes from Kenya, 25 km SE Nakuru; 8, Prothorax (male paratype), ventral view; 9–10, tegmen and median lobe of aedeagus, dorsal view (male paratype); 11–12, sclerites of internal sac (aedeagal flagellum), dorsal and lateral view (male paratype); 13, ovipositor (female paratype); 14, ventral view of outer left portion of metaventricle and first abdominal ventrite, with axillary line and axillary space of left metacoxal cavity (female paratype; arrow indicates the position of the axillary space); 15, left front femur in ventral view (male paratype); 16, last visible abdominal ventrite (hypopygium; male paratype); 17, pygidium (male paratype). Scale bar represents: Figs 9–12, 0.10 mm; Fig. 13, 0.15 mm; Figs 14–15, 0.20 mm; Figs 16–17, 0.25 mm; Fig. 8, 0.40 mm.

Body size and colour. Small-sized (length 1.33–1.62 mm; width 0.60–0.75 mm), elongate. Rather dull, pale yellowish, almost unicoloured; legs yellowish, only teeth on protibiae much darker and blackish distad (Figs 1, 2). Pronotal and elytral sides narrowly flattened, typically same colour as disc and partly translucent. Pubescence (Fig. 1) silvery-whitish, short, prostrate dorsally (each seta nearly 3× as long as an eye facet

diameter; Fig. 23), never obscuring the dorsal body surface. Lateral margin of pronotum and elytra with a series of faintly distinct short setae, each 0.3–0.4× as long as those on elytral disc; ventral pubescence whitish, recumbent, fine, nearly as long as on dorsum.

Dorsal habitus. Body rather transversely convex, long and narrow (Fig. 1). **HEAD.** Shallow punctures nearly 3×

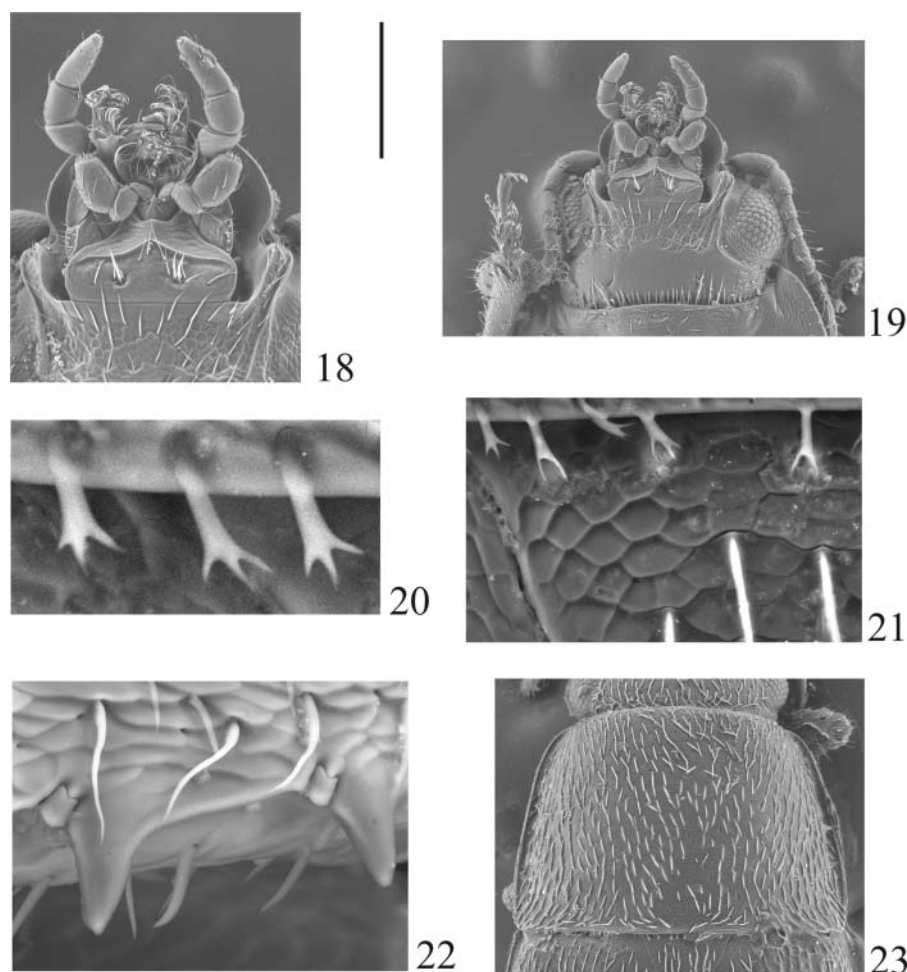


Fig. 18–23. SEM pictures of *Tarchonanthopria freidbergi* gen. nov., sp. nov. (male paratype from Kenya, 25 km SE Nakuru; 18, mouth parts, ventral view; 19, head and anterior portion of prosthernum, ventral view; 20, microchetae on posterior edge of pronotum, in front of scutellum; 21, portion of scutellum with some hairs; 22, teeth on prolegs, with basal spicules; 23, pronotum, dorsal view. Scale bar represents: Figs 19, 23, 0.35 mm; Fig. 18, 0.20 mm; Fig. 21, 25 μ m; Fig. 22, 20 μ m; Fig. 20, 10 μ m.

smaller than eye facets, separated by two to three diameters, surface between punctures distinctly microreticulate and moderately dull.

Pronotum. Transversely convex, nearly $1.4\times$ as wide as long, almost straight at sides, sides markedly convergent anteriorly, broadest at posterior angles (Figs 1, 8, 23); posterior angles distinct, bluntly right angled, sides narrowly and flatly bordered. Pronotal anterior angles separated by $0.66\times$ the corresponding distance between posterior angles (Figs 1, 8, 23). Posterior margin feebly sinuate on either side of scutellum; discal peculiarly minute punctures smaller than on head and sparser, separated by three diameters or more, surface between punctures microreticulate and rather dull.

Elytra. $\sim 1.25\times$ longer than wide (combined width at humeri), subparallel at sides, distinctly and arcuately

narrowed towards apex, broadest in middle or at basal two fifths, nearly as wide as pronotum (Fig. 1). Punctures nearly indistinct, shallower and even more sparse than on pronotum, spaces between punctures microreticulated and rather dull, not transversely strigose. Elytral apices oval, bluntly rounded in both sexes (Fig. 1).

Pygidium. Widely exposed, scarcely convex, apically more distinctly acute in males (Figs 1, 17), rounded in females.

Ventral habitus. Male impressions on metaventricle reduced to a narrow, barely incised median longitudinal line, hardly visible in females.

Appendages. Antennae medium-sized, club small and narrow, $1.7\times$ longer than wide (Fig. 4), with rather short pubescence. In both sexes 1st antennomere $1.2\text{--}1.3\times$ as

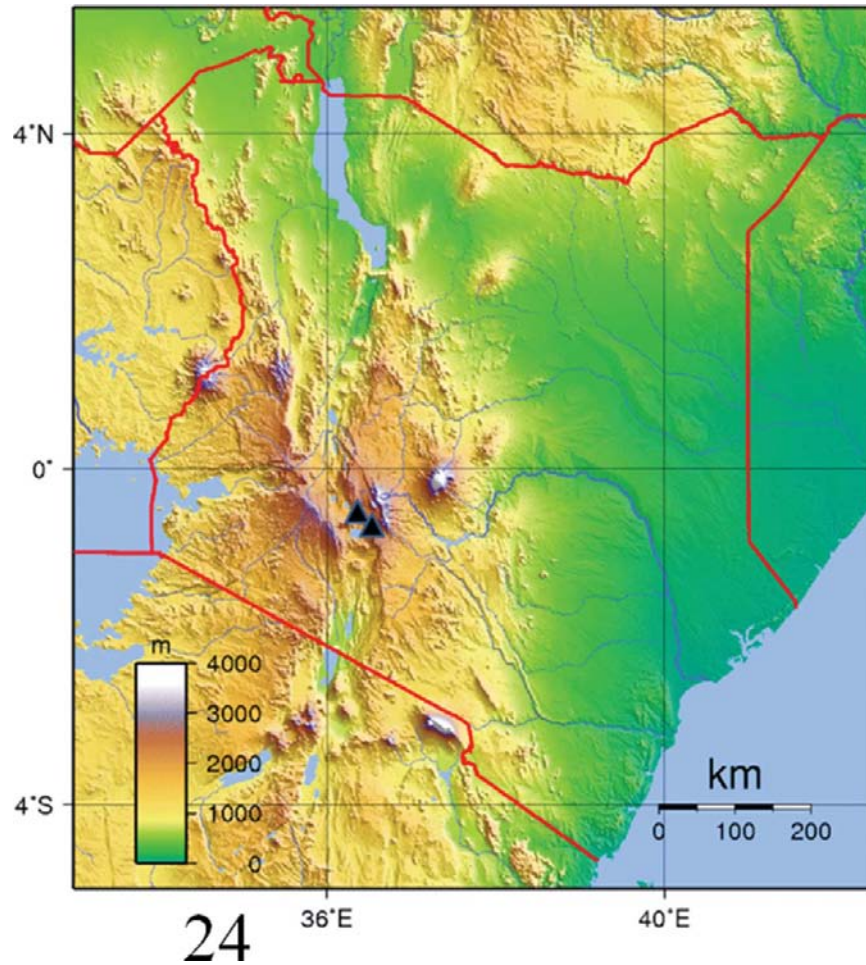


Figure 24. Map of known geographical distribution of *Tarchonanthopria freidbergi* gen. nov., sp. nov. in Kenya (black triangles).

long as maximum width of protibiae (Figs 1, 2, 4); 3rd antennomere in both sexes slender, $\sim 2.0\times$ as long as wide, nearly as long as but distinctly thinner than 2nd antennomere (Fig. 4); 4th and 5th antennomeres in both sexes subequal, moderately slender, distinctly longer than wide; antennal club moderately long and narrow but compact, small-sized, simple, comprising last 3 antennomeres (9th–11th) in both sexes (8th antennomere moderately enlarged in males, $0.65\times$ as wide as 9th antennomere, see Fig. 4, in females narrower, $0.50\times$ as wide as 9th antennomere), nearly $1.4\times$ wider than protibiae, other sexual dimorphism absent; protarsi large, peculiarly narrow in dorsal view, $0.7\text{--}0.9\times$ as long as corresponding tibiae (Figs 1, 2, 3), slightly narrower in female than in male; protibiae as above described (Figs 1, 2, 22); sexual dimorphism not expressed in meso- or metatibiae.

Male genitalia. (Figs 9–12). Median lobe of aedeagus nearly $2.0\times$ longer than wide (Fig. 10). Main sclerites of aedeagal flagellum large, rod-shaped, tripartite in dorsal view (Fig. 11), nearly $0.8\times$ as long as aedeagus, combined

forming a vaguely V-shaped or hook-shaped structure if observed in lateral view (Fig. 12).

Female genitalia (ovipositor). (Fig. 13). ‘Central point’ of ovipositor located slightly proximad of midlength, at proximal four ninths, without ventral spicule directed proximad (Fig. 13). Styli with two apical setae; styli inserted close to apex of contiguous gonostyloids, on each side with two long setae, nearly as long as styli, and placed immediately proximad to them, with a shorter third seta placed distally.

Variation. Only size (1.3–1.6 mm length) was variable in the type series.

Geographical distribution. The species is known from the two mentioned localities in SW Kenya (Fig. 24), but we hypothesize that its geographical range is much wider, including at least part of the eastern African geographical distribution of its host-plant, which is widespread along the Rift Valley from Tanzania to Ethiopia

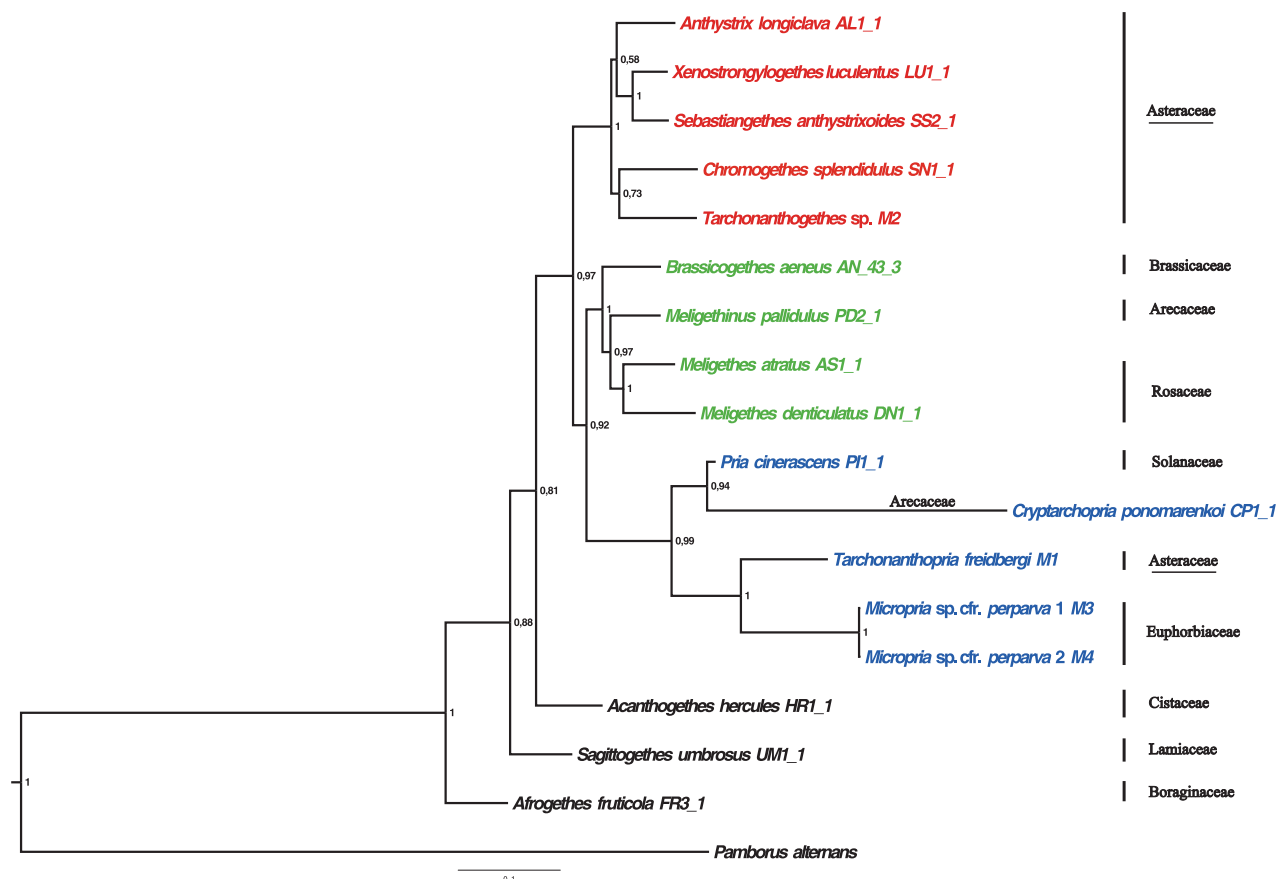


Figure 25. Phylogram of the analysed genera of Meligethinae obtained with MrBayes. Numbers at nodes denote Bayesian posterior probabilities. Larval host plants family of each analysed species are indicated. Affiliation of each analysed species to informal clades of genera as follows: [*Anthystrix* genus-complex + *Chromogethes*] (red); [*Meligethes* genus complex] (green); [*Pria* genus-complex + *Cryptarthropria*] (blue).

(reaching southwards and westwards into Namibia and South Africa, as well as northwards and eastwards to the southern portion of the Arabian Peninsula; Herman, 2002).

Habitat and host-plants. The type specimens were all collected in summer (early February) by beating male inflorescences (capitula) of *Tarchonanthus camphoratus* L. (Asteraceae). The host plants were localized at relatively high altitudes (1900–2100 m a.s.l.), in dry places along the Great Escarpment (Rift Valley), in sparsely forested areas dominated by 3–8 m tall *Tarchonanthus* trees. At both known localities the new species was collected in company with a new species of the meligethine genus *Tarchonanthogethes* Audisio & Cline, 2009 (treated below as *Tarchonanthogethes* sp. in our molecular analysis, and whose description is included in an upcoming revision of the whole genus, comprising some 20 species mostly distributed in South Africa; Audisio *et al.*, 2009a, 2009b; Audisio & Cline, unpublished data). The flowering time of local *Tarchonanthus* trees at both known localities

was near its end when the new species was collected (6–9 February 2011); we believe that the local optimal reproductive period for *Tarchonanthopria freidbergi* sp. nov. should be between late November or early December and the first 2 weeks of January.

Phylogenetic analysis

The obtained topology (Fig. 25) from the concatenated phylogenetic data, includes two macroclades: one, well supported (posterior probability: pp = 1) grouping of *Anthystrix* and allied genera (the ‘*Anthystrix*-clade’), and one not very well supported (pp = 0.92) including a likely monophyletic ‘*Pria*-clade’ plus a second monophyletic sister clade including *Meligethes*, *Brassicogethes* and *Meligethinus* (i.e. the ‘*Meligethes*-clade’). *Acanthogethes*, *Sagittogethes* and *Afrogethes* resided in isolated positions outside the two main clades, and with low support values.

The new genus *Tarchonanthopria* was shown to be sister to *Micropria*, this clade being sister to *Cryptarthropria*

and *Pria*. Unfortunately, only nuclear markers were sequenced for the analysed species of *Micropria* and *Cryptarchopria* (due to non-optimal preservation of DNA, see Materials and methods). However, according to our results, the clades including these species are very well supported ($pp = 0.99$ for the main node).

Tarchonanthogethes, which is the object of an ongoing taxonomic revision (Audisio *et al.*, unpubl), was placed in a monophyletic clade including, as expected based on morphological data, other members of the ‘*Anthystrix* genus-complex’ with high support values ($pp = 1$).

Discussion

Taxonomic position

The systematic position of *Tarchonanthopria freidbergi* Audisio & Cline, gen. nov., sp. nov., as suggested by morphological evidence, is ambiguous due to the presence of a peculiar combination of characters, which are unknown in all other Meligethinae of the so-called ‘*Pria* genus-complex’, as reported in the generic differential diagnosis above (for a delimitation of this informal group please refer to the Introduction above, and also to: Jelínek, 1975, 2000; Endrödy-Younga, 1978; Kirejtshuk, 1980; Cooper, 1982; Audisio *et al.*, 2009a). The simple hypopygidium (lacking arcuate lateral impressions), the simple anterior margin of the prosternum (lacking any trace of antennal ridges and raised proepisternal-prosternal sutures), the shallow, vaguely C-shaped, postocular grooves on ventral surface of head, and the medially wide and distinct presutural (adsutural) elytral striae are, in fact, shared characters mainly with *Pria* Stephens; however, members of this large (mostly Palaeotropical) genus strongly differ from the new genus and species by exhibiting the regular presence of simple or only minutely and distally toothed or crenulate outer edges of protibiae, and never so narrowly shaped, trapezoid-like and transversely convex pronotum. Moreover, *Pria* members exhibit a dispersed punctuation and asymmetrically dispersed setae on mentum, always more distinctly and usually densely punctured pronotum and scutellum, and very often more markedly expressed sexual dimorphism in antennal shape. Most of these same characters also separate *Tarchonanthopria* gen. nov. from other known Meligethinae genera sharing a simple hypopygidium (i.e. lacking the arcuate impressions typical of more derived genera of Meligethinae), e.g. *Restiopria* Audisio, Jelínek & Cline, 2011, *Cryptarchopria* Jelínek, 1975, *Horakia* Jelínek, 2000, *Palmopria* S. Endrödy-Younga, 1978, and related genera (see Audisio *et al.*, 2009a, 2011). Close relationships to any other Meligethinae are seemingly obscure.

Our preliminary molecular results appear to exclude a close relationship between *Tarchonanthogethes* and

Tarchonanthopria, despite the two genera sharing the same tribe of host-plants, i.e. Asteraceae Tarchonantheae (Fig. 25, Table 3). In particular, no apparent relationship was shown to occur with all other southern African meligethine genera associated with male flowers of Tarchonantheae (*Anthystrix* Kirejtshuk, 1981, *Sebastiangethes* Audisio, Kirk-Spriggs & Cline, 2008, *Xenostongylogethes* Audisio & Cline, 2009, and *Tarchonanthogethes* Audisio & Cline, 2009; Table 3), all these taxa being both morphologically and genetically related to each other, and belonging to a distinct complex of genera (Audisio *et al.*, 2008b, 2009a, 2009b; Trizzino *et al.*, 2009).

Our molecular analyses are preliminary, and include only a modest sampling of the 47 known Meligethinae genera, and therefore robust conclusions cannot be attempted at this time. Unfortunately, several of the ‘missing key-genera’ for our preliminary molecular analysis are only known from tropical forest localities in southern India, Indochina, Central Africa, western Indian Ocean Islands and Madagascar. Most of them have an unknown biology and represent difficult targets even for specialized field expeditions to collect. However, phylogenetic analyses based on molecular data (Fig. 25), places *Tarchonanthopria* gen. nov. within the so-called ‘*Pria* genus-complex’, as suggested also by adult morphology.

The numerous morphological characters shared between *Pria* and *Tarchonanthopria* (despite the fact that some are represented by putative symplesiomorphies, as discussed above), suggest a likely sister-group relationship between these two genera; the former including some 90 described species of mostly Palaeotropical distribution that are associated with flowers of several different and unrelated plant families (Table 3; see also Cooper, 1982). Conversely, preliminary molecular evidence indicates a possible sister-group relationship of *Tarchonanthopria* with the Tropical African genus *Micropria* Grouvelle, which included a dozen described and undescribed species mostly distributed in Central, Western and Central-Eastern Africa (Kirejtshuk, 1980; Audisio *et al.*, 2009a; Audisio & Cline, unpubl data), and associated as larvae with inflorescences of Euphorbiaceae trees of the genus *Macaranga* Thouars (Audisio & McPherson, unpubl data; Table 3).

Our preliminary molecular analysis also depicts a close position of *Meligethes*, *Brassicogethes* and *Meligethinus*, which all grouped together in the same clade that was not distantly related to *Pria* and allied taxa (as also suggested by morphological analyses; Audisio *et al.*, 2009a; Audisio & Cline, unpubl data). This grouping was quite separated from other genera (e.g. *Afrogethes*, *Acanthogethes* and *Sagittogethes*) that were previously embedded within a markedly polyphyletic ‘genus’ *Meligethes* s.l. (Audisio *et al.*, 2009a). This evidence is the first preliminary confirmation of the robustness of the backbone of our recent proposal (Audisio *et al.*, 2008a, 2008b, 2009a, 2009b)

aimed to reform the previous (Kirejtshuk, 2008) generic systematics of Meligethinae, and answers the recent comments and taxonomic proposal of Kirejtshuk & Kirejtshuk (2012) and Chen *et al.* (2013).

Conclusions

The combined morphological and molecular evidence clearly indicate that the new species described herein must be placed in a separate, thus far monobasic, new genus. The new genus *Tarchonanthopria*, despite its partially unexpected molecular placement near the morphologically distinct genus *Micropria*, should more reliably be placed closer to the diverse genus *Pria*, due to *Tarchonanthopria* and *Pria* sharing a series of important morphological traits, including some putative apomorphies.

Our molecular analyses also suggest that no close relationships occur between *Tarchonanthopria* gen. nov. and members of the relatively large clade of the so-called 'Anthystrix genus-complex', although both are strictly associated as larvae with Asteraceae Tarchonantheae.

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