TAXONOMIC AND FAUNISTIC STUDIES OF BIG-HEADED FLIES (DIPTERA: PIPUNCULIDAE)

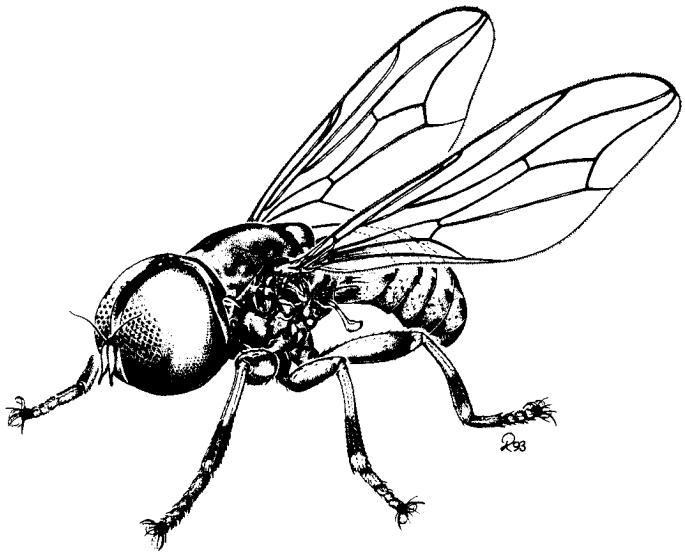
Mihály Földvári

Ph. D. thesis

2004

Taxonomic and faunistic studies of big-headed flies (Diptera: Pipunculidae)

Mihály Földvári



Tomosvaryella sp. (after De Meyer 1993)

University of Szeged, Faculty of Science
Doctoral School of Environmental Sciences, Conservation Ecology Doctoral Program
Program leader: Prof. Dr. László Gallé

Supervisor: Prof. Dr. László Papp
Hungarian Natural History Museum, Department of Zoology

Hungarian Natural History Museum

2004

CONTENTS

INTRODUCTION

Objective of the Ph.D. thesis

The target group of our work is the family Pipunculidae (big-headed flies), which is the closest relative of Syrphidae (hover flies), and they are endoparasites of Auchenorrhyncha during their larval stage.

The aim of our studies was to reveal species richness within this family in Hungary, in other parts of Europe and in the Afrotropical Region.

Our work concentrated on four major topics: genus *Tomosvaryella* in Central and West Europe, Pipunculidae of Hungary, faunistic studies in different parts of Europe and revision of the Afrotropical Eudorylini.

The genus *Tomosvaryella* needed a revision, since many species were doubtful and very few descriptions were detailed enough (most of them without drawings).

The last specialist who dealt with Hungarian Pipunculidae was Márton Aczél in the 1940s and there were no new records or publications, and also a rearrangement and identifications based on recent results was lacking.

To extend the faunistic work we planned to treat other European collections (Denmark, Canary Islands and Madeira) in order to reveal what species exist in the West Palaearctic Region.

After the type species of *Eudorylas* had been cleared and the genera had been defined within Eudorylini (ICZN 2002, Skevington and Yeates 2001), it was necessary to revise all species of the tribe to gather more information on the diversity of this group. The present thesis is aiming the Afrotropical part of the world fauna.

Taxonomic and faunistic objectives are defined in terms of thorough descriptions, identification keys, species new to science, synonyms proposed and species lists for the different faunas investigated.

General features of Pipunculidae

Pipunculidae or big-headed flies are usually small or medium sized, inconspicuous flies (except for *Nephrocerus* spp.) and are characterised by the large compound eyes occupying most of the hemispherical head. They are closely related to the hover flies (Syrphidae), but they can easily be differentiated by the wing venation (Fig. 1.), the cell r_{4+5} being open and the vena spuria being absent.

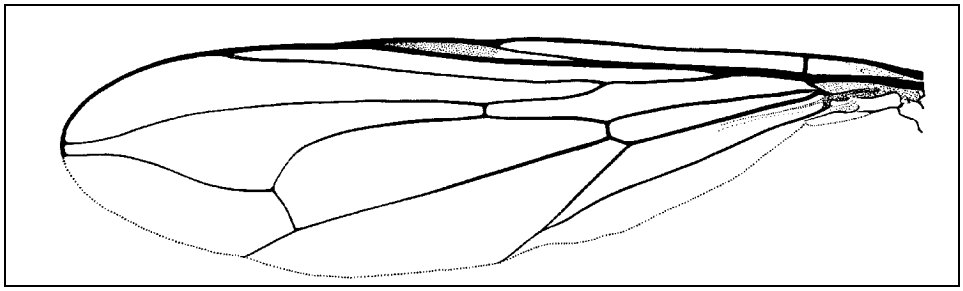


Fig. 1. Wing of *Eudorylas zonellus* (after Coe 1966)

The males have holoptic eyes in most of the genera (*Dorylomorpha* is an exception), and females possess a well sclerotized ovipositor to lay eggs in the abdomen of the homopteran host. About 1300 species have been described world-wide so far, but the fauna is still considered to be poorly known and an estimate of well over 2000 is given by Skevington and Yeates (2001). During the larval stage pipunculids are endoparasitoids of leafhoppers (Auchenorrhyncha: Homoptera), mainly of the families Cicadellidae, Delphacidae and Cercopidae. Together with Dryinidae (Hymenoptera) and Strepsiptera they are considered as the most important parasites of Auchenorrhyncha (Freytag 1985, Waloff and Jervis 1987). The family is important as biological control agent of pest species of leafhoppers, and considerable research has been done on those species that are parasites of rice leafhoppers (Hardy 1971, Jervis 1980, Koizumi 1959, Waloff and Jervis 1987, Yano 1979, Yano *et al.* 1984).

Review of literature of big-headed flies

History of the family

The earlier name of this family was Dorilaidae, since its type genus used to be *Dorilas*, erected by Meigen (1800). Later this work has been suppressed by the ICZN (1963, opinion 678), and *Pipunculus* Latreille was selected as type genus for the family with the new name Pipunculidae.

Pipunculidae belong to the Cyclorrhapha, Aschiza or Atriata. Together with the Syrphidae (hoverflies) they are considered to form a subordinate group, Syrphidea or Syrphoidea by Griffith (1972). He gives five character states as evidence of the synapomorphy of the superfamily.

The monophyly of Pipunculidae is established by Griffiths (1972) and Hennig (1973). Five synapomorphous character states are included in their list:

1. large compound eyes, occupying most of the head;
2. ovipositor modified into a piercer like structure;
3. larvae endoparasites of Homoptera;
4. larvae with chitinized post-spiracular plate;
5. females with enlarged ommatidia anteriorly (not distinctive in Nephrocerus).

Systematics of Pipunculidae

The relationships of the family Pipunculidae with Syrphidae has been studied by Skevington and Yeates (2000), and they gave the phylogenetic tree of the Syrphoidea (Fig. 2.) based on molecular characters. In this study they used 420 base pairs of mitochondrial 12s ribosomal DNA and 490 bp of 16s rDNA for 27 species of the superfamily.

They also give a phylogenetic tree for the genera of the family Pipunculidae using molecular data as well as morphological data. The latter was mainly based on the character matrix of Rafael and De Meyer (1992). After this study Skevington and Yeates (2000) concluded with a relationship of the subfamilies as known before, and they hypothesised the subfamily Nephrocerinae to be paraphyletic (see Fig. 3.).

The first revisionary works (Becker 1898, 1900, Kertész 1910, Verrall 1901) recognised four genera: *Nephrocerus*, *Pipunculus*, *Chalarus* and *Verrallia*. The genus *Pipunculus* was divided initially into a number of species-groups, based on the coloration of the pterostigma, position of the R-M cross vein, and the pollinosity of the abdomen and thorax. This division was used until Aczél (1939, 1940) gave generic or subgeneric status to the different species-groups. He divided the family into two tribes (Aczél 1939) and later (Aczél 1948) three tribes: Nephrocerini, Protonephrocerini and Dorilaini.

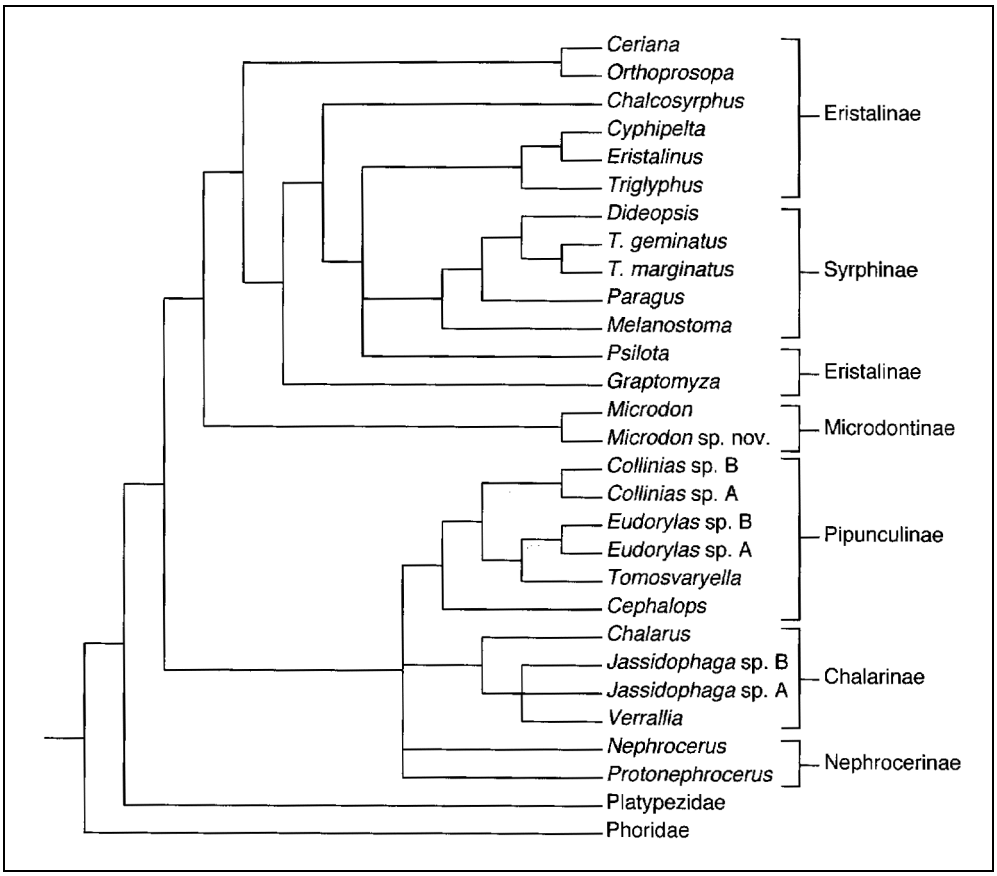


Fig. 2. Consensus tree of syrphoid relationships inferred from all molecular data (combined 12s and 16s data) (after Skevington and Yeates 2000)

Aczél (1948) presented also the first phylogenetic model of the higher taxa of pipunculids, with discussion of the fossil records and the evolution of certain character states. Pipunculid classification was elaborated further by D. Elmo Hardy in his catalogues for the different zoogeographical regions (Hardy 1965, 1966*a*, 1975, 1980, 1989). He considered *Nephrocerus* as belonging to a separate subfamily (Hardy 1943) or to the tribe Nephrocerini of the Pipunculinae (Hardy 1965). Kozánek and Lauterer (1987) recognised the subfamily Nephrocerinae. Rafael (1988) has shown the Nephrocerinae (including *Nephrocerus* and *Protonephrocerus*) to be a monophyletic sister-group of the Pipunculidae.

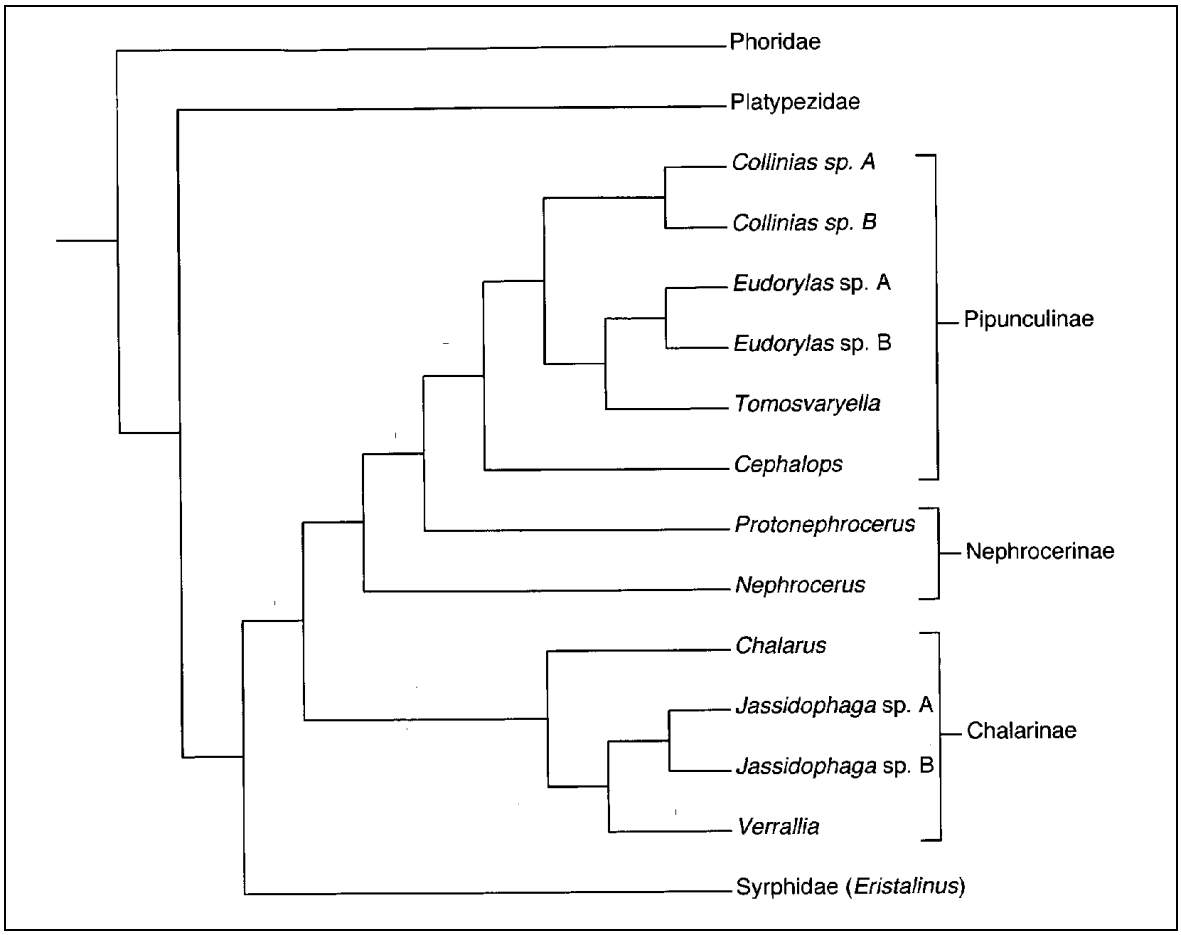


Fig. 3. Most-parsimonious tree of pipunculid relationships inferred from combined molecular (12s and 16s) and morphological data (after Skevington and Yeates 2000)

There has been much controversy regarding the generic or subgeneric status of certain taxa, particularly about the genus *Pipunculus*. Hardy (1980, 1989) considered the taxa *Cephalops*, *Eudorylas*, *Pipunculus* s.s. and *Cephalosphaera* as subgenera of *Pipunculus* s.l. European authors (Bańkowska 1972, Coe 1966, Collin 1956, Lauterer and Kozánek 1987), as well as Morakote and Hirashima (1990*a-d*), consider *Cephalops*, *Eudorylas* and *Pipunculus* as separate genera and *Cephalosphaera* as part of *Cephalops*, and *Jassidophaga* as part of *Verrallia* (as separate subgenera or not). Kapoor *et al.* (1987) consider *Eudorylas* as a separate genus and the other taxa as subgenera of *Pipunculus*, while Rafael (1986) and Tanasijtsuk (1988) give all taxa generic status. Taxa like *Beckerias* and *Congomyia* have always been considered of generic status.

The most problematic group is Eudorylini and particularly *Eudorylas*, since the tribe contains 515 species world-wide in nine genera (De Meyer 1996), serious misinterpretations of what constitutes *Eudorylas* have led to an acute lack of stability in the genus. This was solved in two stages: Skevington and Yeates (2001) made a phylogenetic revision of the tribe with redefinitions of the genera, and the ICZN (2002) issued an opinion to stabilise the genus name *Eudorylas*.

They propose *Congomyia* and *Moriparia* as junior synonyms of *Claraeola*, and *Metadorylas* as junior synonym of *Eudorylas*; genus groups are defined based on the cladogram produced for sixty species and 137 characters, and they describe two new genera (*Clistoabdominalis* Skevington and *Dasydorylas* Skevington). The following genus groups were recognised within the tribe:

- *Allomethus* genus group (*Allomethus*, *Basileunculus*, *Claraeola*)
- *Dasydorylas* genus group (*Dasydorylas*)
- *Amazunculus* genus group (*Amazunculus*, *Elmohardyia*)
- *Eudorylas* genus group (*Eudorylas*, *Clistoabdominalis*)

Eudorylas has had a troubled taxonomic history. Aczél erected *Eudorylas* on excellent grounds in 1940. Unfortunately, he never examined specimens of the type species that he designated, *Cephalops opacus* Fallén, 1816. He merely selected the oldest available name for the type species from within Becker's (1897) and Cresson's (1911) Group I and Sack's (1935) Group IV. From characters listed by these authors, Aczél was convinced that these groups corresponded to his new genus, *Eudorylas*. It is clear now, that not all species within these groups were correctly placed. Sergey Kuznetzov (St. Petersburg) and Marc De Meyer (MRAC) recently examined the C. opacus and they agree it is a species of *Microcephalops* thus Aczél has misidentified the original type species as being *Eudorylas*. To maintain the stability in nomenclature, Article 70.3 of the Code requires the change of the type species for a genus when the former is based on a misidentification (ICZN 1999). After the application of De Meyer and Skevington (2001) the Commission used its plenary power to set aside all previous fixations of type species for *Eudorylas* and to designate *Pipunculus fuscipes* (Zetterstedt, 1844) as the type species.

Although progressing revisionary work is going on in most biogeographical regions (Ale-Rocha 1996, De Meyer 1989*a*, 1989*b*, 1992, 1993, 1996*a*, Földvári and De Meyer 2000, Rafael 1993, 1995, 1996, Rafael and Ale-Rocha 1997, Rafael and Menezes 1999, Skevington and Marshall 1998), the Afrotropical Eudorylini has not been revised since Hardy's works, therefore it is necessary to deal with this group.

The fossil record of Pipunculidae is very limited and has been reviewed by Aczél (1948). According to his summary all pipunculid fossils are dated from the Eocene and Oligocene, and belong to Chalarinae (genus *Verrallia*) and Nephrocerinae (genera *Nephrocerus*, *Metanephrocerus* and *Protonephrocerus*).

Two species of *Eudorylas* (subfamily Pipunculinae) have been reported since then by De Meyer (1995*a*), however the fossil record is too limited with 14 known specimens from Baltic and Dominican amber.

Life cycle

Host

Pipunculids are exclusively parasitoids of Auchenorrhyncha, host have been recorded from families like Cicadellidae, Cixiidae, Cercopidae, Flatidae, Fulgoridae, Delphacidae and Membracidae (Ferrar 1987). All species of *Eudorylas* are parasitoids of the homopteran family Cicadellidae with the only exception of the Australian *E. helluo* (attacking Flatidae) according to Coe (1966).

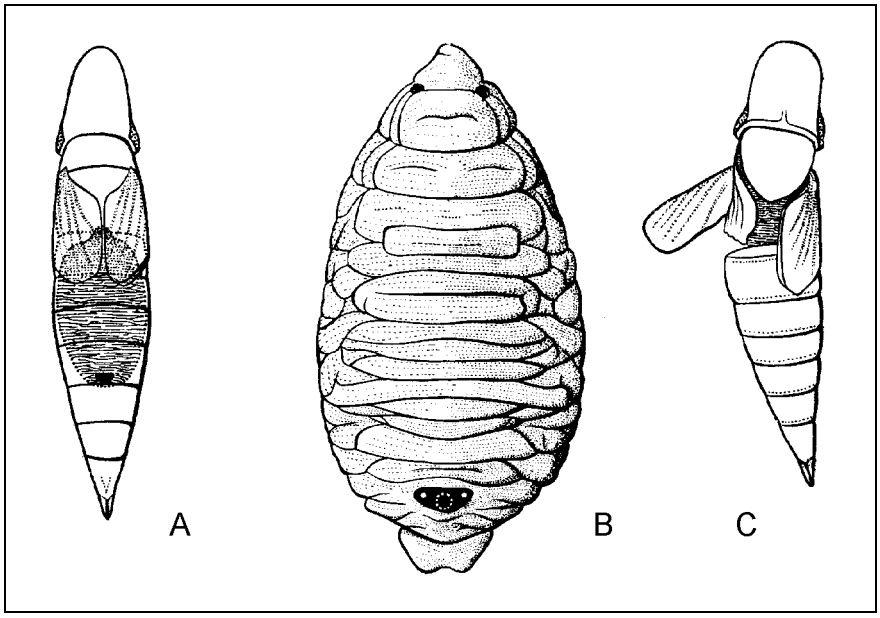


Fig. 4. Pipunculid larva and host. – A: *Hecalus* sp. (Homoptera) with larva of *Pipunculus cruciator* in abdomen, B: mature larva of *Cephalops mauritanus*, C: same as A, after escape of the full-grown larva (after Coe 1966)

The host specificity of pipunculid species varies, in most cases they parasitise several species within a given leafhopper genus, but there are examples where different families (Fulgoridae and Jassidae) are attacked (Lindberg 1946). There are several inventories summarising our knowledge on host and parasitoid relationships (Aczél 1943, Freytag 1985, Skevington and Marshall 1997).

The female fly hovers over a suitable host and inserts an egg into the abdomen with her piercing ovipositor. Most pipunculids attack third, fourth and fifth nymphal instars, but *Verrallia* attacks only adult hosts of Cercopidae (Keilin and Thompson 1915, Lindberg 1946).

The parasitism affects the host's abdomen, genitalia and wings of both sexes (Lindberg (1946) established 4 types of effects occurring on *Chloriona* species). The accessory glands are missing in both sexes, the copulatory organs of the males and the ovipositor of the female is reduced or not even developed at all, but symmetry of the genitalia is rarely changed and the wing venation is aberrant (in *Chloriona*, males can become short-winged, brachypter, which occurs in unparasitised females also).

Although the reproductive organs of the host are usually destroyed, a few female leafhoppers are able to produce a small number of eggs before the larva destroys their ovaries, but it is not known if such eggs are viable (Ferrar 1987). The whole body will be poorly pigmented, therefore their colour becomes more yellow, yellow-brown (Lindberg 1946). The rate of movement is decreased as well probably due to reduction in femur length and damage to the thoracic muscles and nervous system (May 1979, Yano *et al.* 1985).

Rates of parasitism vary from fractions of a percent to 100% in local populations (Skevington and Marshall 1997).

Egg

The eggs of *Chalarus* are broadly oval, rounded at one end, and tapering to a distinct, nipple-like protuberance at the other end; rounded on one surface, flatter on the other; chorion smooth and transparent. The egg swells and becomes more rounded during development within the abdomen of the host, presumably by absorption of fluid; size varies from 0.20-0.39 mm (Ferrar 1987).

Larva

Having only two larval instars instead of the general three (Aczél 1943, Ferrar 1987, Hennig 1952, Jervis 1980, Keilin and Thompson 1915, Parker 1967, Sander 1985, Waloff and Jervis 1987, Whittaker 1969), Pipunculidae are known to be unusual among Cyclorrhapha and unique within the group Aschiza. Rothschild (1964) is of the opinion that there should be three larval stages (with an intermediate moult), based on the great increase in size during the younger instar, but he also noted that the cephalopharyngeal skeleton was the same size in the smallest and largest younger instar, and that there was only one exuvium found in the host.

The orientation of the parasitic larvae is changing, but in most cases it is the same as the orientation of the host according to Lindberg (1946). In addition, Ferrar (1987) states the final instar larvae point backwards or forwards with about equal frequency.

The younger instar appears to be unsegmented in the earlier stages, but later, segments can be seen from the second to the tenth bearing many small spines ventrally, and the posterior body segment with a transparent, balloon-like, swollen vesicle. The anterior spiracles are absent, the posterior spiracles are present and very much similar to the structure of the next instar. The older instar has large vesicle and its body segmentation is obscured by intricate secondary folding of the cuticle, without spines. Antennae and maxillary palps are visible as four conspicuous, bulbous projections on head. Anterior spiracles present, each forming a knob-like protuberance with a few sessile apertures. Posterior spiracles are posterodorsally on the last abdominal segment, on a single, heavily sclerotized plate (very characteristic for the family) and have three small apertures each (Ferrar 1987).

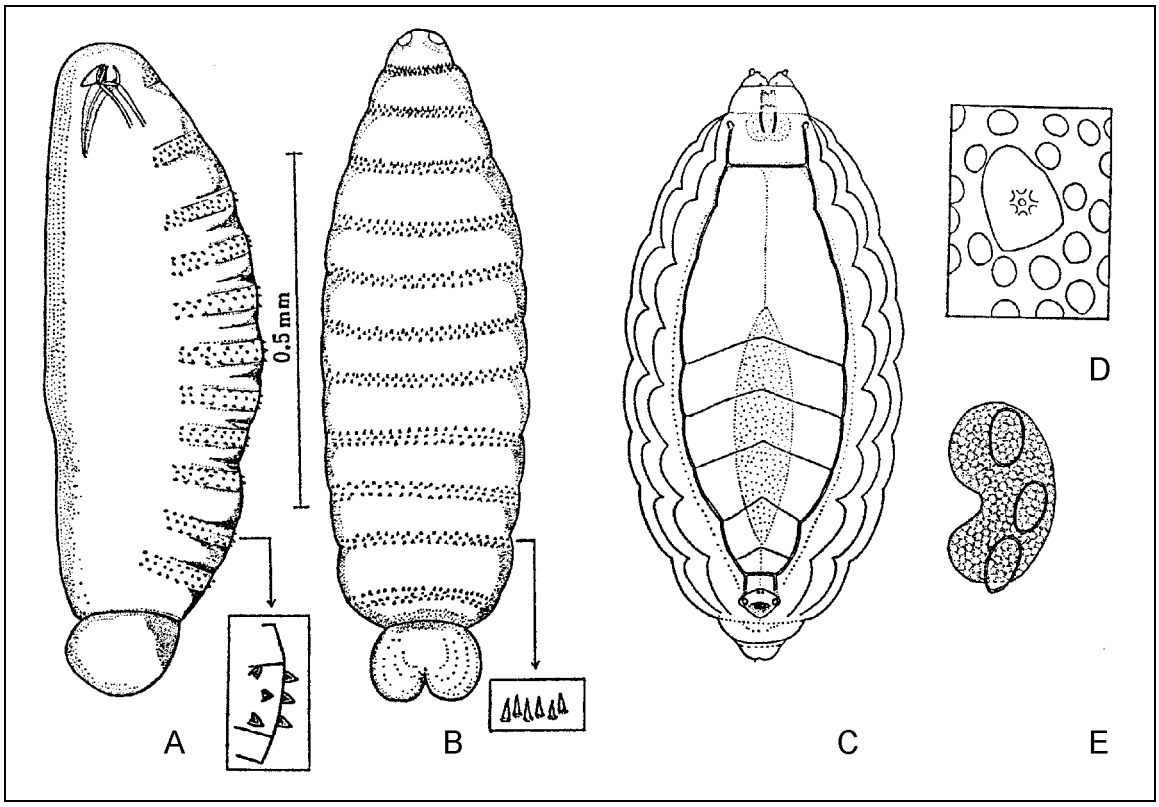


Fig. 5. Pipunculid larvae. – A: first instar of *Tomosvaryella oryzaetora*, lateral view, B: first instar of *Pipunculus orientalis*, ventral view, C: second instar of *Pipunculus javanensis*, dorsal view, D: fine granulate structure of larval integument, E: posterior spiracle (after Morakote and Yano 1988)

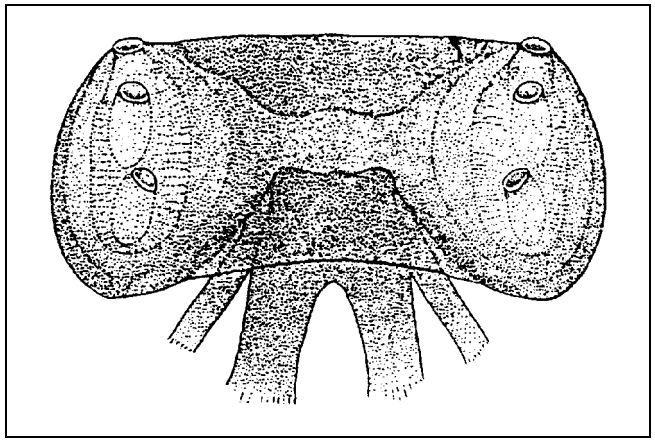


Fig. 6. Posterior spiracular plate of the full grown larva of *Tomosvaryella frontata* (after Parker 1967)

Younger larvae probably feed on haemocoel fluids, older larvae feed on general body contents, and towards maturity they eat all the internal organs of the host which leaves the nervous system and the somewhat shrunken alimentary system until last (Ferrar 1987).

There are also examples where more than one parasite attacks the same host (Aczél 1943, Keilin and Thompson 1915, de Meijere 1917, Perkins 1905, Whittaker 1969); and Waloff and Jervis (1987) report a field-collected typhlocibine nymph containing up to seven offspring of *Chalarus*. In these cases only one pipunculid will develop to maturity.

The larva brakes the abdomen of the host and crawls out between two segments (usually between segment 3 and 4 according to Lindberg 1946), and tries to find a suitable place for pupariation. Most larvae fall to the ground and pupate under detritus or in the soil, but some adhere to vegetation.

Puparium

Since the family Pipunculidae belongs to the Cyclorrhapha, they form a puparium, i.e. the pupa will develop with the exuvium of the last larval instar, using it for an extra protection. The pupariation takes place always outside the host, in various places: on decaying wood, on a leaf of the host plant of the leafhopper.

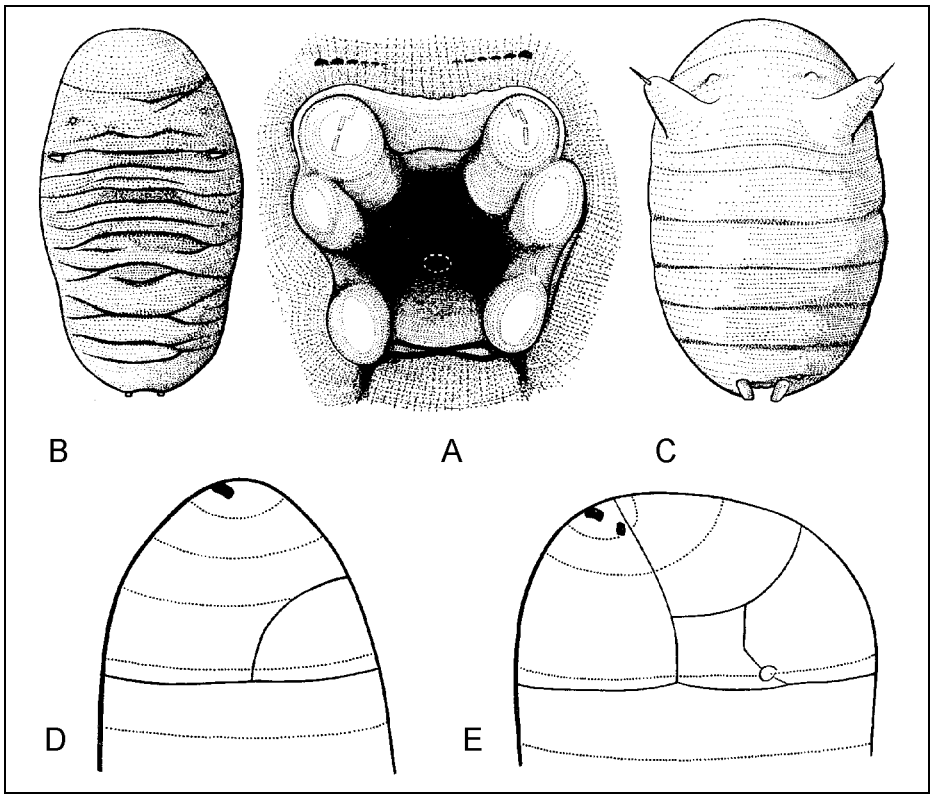


Fig. 7. Larvae and puparia. – A: *Eudorylas cinerascens*, posterior spiracular plate of mature larva; B: puparium, general pipunculid type, C: puparium, *Eudorylas cinerascens*, D, E: lateral view of anterior portion of puparia, showing operculum (D: *Pipunculus* (s. l.) sp., E: *Chalarus* sp.) (after Coe 1966)

The colour of the puparium is often brick-red or reddish brown, in some species it darkens several days after pupariation. The larval posterior spiracular plate is always conspicuous and anterodorsally a pair of pupal respiratory horns protrudes through the puparium wall (Ferrar 1987). The operculum consists of two detached pieces in most pipunculids, and five pieces in case of *Chalarus* according to Coe (1966).

Adult

The majority of species overwinter as diapausing pupae. Several, however overwinter as first instar larvae within the hosts, resuming growth and development only when the host comes out of diapause. In *Pipunculus campestris* the overwintering stages of English and German populations are apparently different, and since the host's (Auchenorrhyncha in general) voltinism varies with latitude and photoperiod, Waloff and Jervis (1987) suggest that the intraspecific variation in parasitoid phenology is likely to occur. Phenologies of 28 species are known; 13 of them are univoltine, 13-15 are bivoltine and zero to two are trivoltine according to Skevington and Marshall (1997).

The body ratios can be seen on a habitus drawing on Fig. 8., however a detailed description of the adult's morphology is given in the "Materials and Methods" chapter.

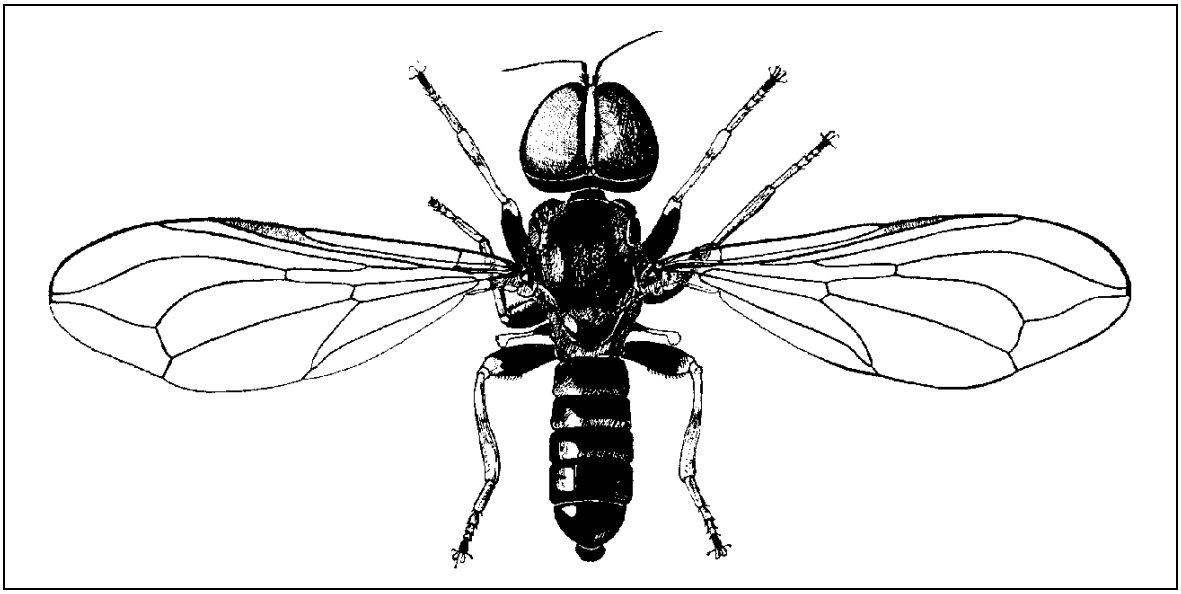


Fig. 8. Adult of *Pipunculus thomsoni* Becker (after Coe 1966)

Review of literature on Afrotropical Eudorylini

The Afrotropical pipunculid fauna was elaborated by numerous authors, however Elmo D. Hardy did the most contribution towards a better knowledge of the species and their recognition. In total, Hardy published 51 works dealing with Pipunculidae between 1939 and 1989. According to Skevington and De Meyer (in prep.) it is clear that his impact was substantial from 1938 onwards. By 1972 he had doubled the number of described (and currently valid species): from 292 known in 1938, he described an additional 320. In case of the Neotropical fauna he tripled and in case of the Nearctic and Oriental faunas he doubled the number of known species. His contribution to the Australasian/Oceanian fauna is considerable (30.2% is described by Hardy) and the only exceptions are the Palaearctic fauna (0.8%) and the Australasian fauna (0%). The latter region is poorly understood, but apparently very species rich according to recent studies by Skevington (1999, 2001, 2002). His largest impact was on the Afrotropical region with 17 valid species previously described and he added 105. When compared with the currently known and valid species, 70.5% of the Afrotropical fauna is described by Hardy (38.3, 31.8 and 29.3% of the Nearctic, Oriental and Neotropical fauna, respectively) based on Skevington and De Meyer (in prep.).

If we consider the Afrotropical species of the tribe Eudorylini, Hardy (1949*a*, 1949*b*, 1950, 1952, 1959*a*, 1959*b*, 1961, 1962, 1980) published numerous papers dealing with the African fauna, and he tried to summarise his knowledge by describing the species, give the closest relative and provide an illustrated identification key. He mainly worked on material from the Democratic Republic of Congo (also known as Belgian Congo or Zaire), the Republic of South Africa and Madagascar. These are the regions where most of the collections have specimens from. Hardy's descriptions are very important, since he described all external characters thoroughly, noted most of the minor differences, but he does not usually give drawings of male genitalia, and in these cases it is only the surstyli in dorsal view, which can be variable. Therefore in some cases he described a species under different names in the same publication (e.g. *E. amitinus* and *E. fractus* or *E. diversus* and *E. pusillus*).

Other authors contributing to the this work include Becker (1914, 1919), Bezzi and Lamb (1926), Curran (1929), Lamb (1922), Lindner (1956), Loew (1858, 1860) and Rapp (1946), who described only few species, in many cases only one, and they usually did not give drawings or notes on possible relationships.

MATERIALS AND METHODS

Collections

Various collections have been visited or have been asked to send material for study. We have studied mostly type specimens and in case of the Afrotropical revision, the unidentified material of the tribe Eudorylini was requested and sent as well.

The following institutions and museums kindly put material at our disposal: (curators are in brackets):

AMNH – American Museum of Natural History, New York, USA (D. Grimaldi)
BMNH – The Natural History Museum, London, England (N. Wyatt)
BPBM – Bernice P. Bishop Museum, Honolulu, Hawaii, USA (N. Evenhuis)
CAS – California Academy of Sciences, San Francisco, USA (N. Penny)
EIHU – Hokkaido University, Sapporo, Hokkaido, Japan (M. Suwa)
HNHM – Hungarian Natural History Museum, Budapest, Hungary (L. Papp)
IPZFA – Instituto di Patologia e Zoologia Forestale e Agraria, Firenze (A. Belcari)
ISNB – Royal Belgian Museum for Natural History, Brussels, Belgium (P. Grootaert)
KOZ – Private collection in Bratislava (M. Kozánek)
MNHN – Museum National d'Histoire Naturelles, Paris, France (M. Baylac)
MRAC – Royal Museum for Central Africa, Tervuren, Belgium (M. De Meyer)
NHMB – Naturhistorisches Museum, Basel, Switzerland (D. Burckhardt)
NHRS – Naturhistoriska riksmuseet, Stockholm, Sweden (Th. Pape)
NMKE – National Museum of Kenya, Nairobi, Kenya (M. De Meyer)
NMNW –National Museum of Namibia, Windhoek, Namibia (A. Kirk-Spriggs)
NMSA – Natal Museum, Pietermaritzburg, Kwa–Zulu Natal, South Africa (D. A. Barraclough)
NMSA – Naturhistorisches Museum Stift Admont, Austria (J. Götze)
SMNS – Staatliches Museum für Naturkunde, Stuttgart, Germany (H.-P. Tschorsnig)
UMO – University Museum, Oxford (A. Pont)
USNM – National Museum of Natural History, Washington D.C., USA (F. C. Thompson)
ZMHB – Museum für Naturkunde der Humboldt–Universität, Berlin, Germany (M. Kotrba)
ZML – Zoological Museum, Lund, Sweden (R. Danielsson)
ZMUC – Zoological Museum, University of Copenhagen, Copenhagen, Denmark (R. Meier)

Examination of material

Both dry and alcohol specimens were studied with an Olympus (SZ 60) stereoscopic microscope at magnifications of 10-112.5 times; with cold light (21 V, 150 W). All external characters were studied and dissections have been carried out with this microscope. The genital parts (microscopic slides) were seen with a Zeiss (Amplival) light microscope attached with a drawing tube.

Drawings

Drawings were made with a drawing tube ("camera lucida") attached to the microscopes; this produced an additional magnification of 1.2x. A Zeiss (Technival) microscope was used for the stereoscopic drawings and the Zeiss (Amplival) was used for the light microscopic drawings. For some of the drawings (both stereo and light) a Leica (SM–LUX) was used, provided with a drawing tube as well. The original pencil drawings (made at various magnifications – scale bar always given) were copied in ink on tracing paper; these were scanned and then reduced digitally.

Microscopic slides

Male genitalia were examined separately, after treatment with 10% of NaOH or KOH for 24 hours. In some cases the vials containing the dissected abdomen was heated to reduce reaction time. After the different parts were cleared sufficiently, they were put in lactic acid, 70% alcohol and glycerine. The separated postabdomen was put into a drop of gelatine-glycerine on a microscopic slide. This mixture is solid at room temperature and becomes fluid after careful heating. This feature makes it possible to change the orientation of the specimen and then to fix it until the drawing is finished.

After examination and drawing the genital parts were cleaned with NaOH or KOH and then placed in a small plastic vial filled with glycerine and attached to the same pin which bears the specimen.

Morphology and terminology of Pipunculidae

The terminology of morphological parts of Pipunculidae used in the taxonomic descriptions of the thesis follows Albrecht (1990) and Földvári and De Meyer (1999). Definitions and expressions of the postabdomen of Diptera have been discussed by Griffith (1972) and by Sinclair (2000) and Merz and Haenni (2000).

Head

The (sub)hemispherical head is mainly occupied by the two compound eyes (Fig. 9.), which may be either holoptic (touching) or dichoptic (separated). Usually the males have holoptic eyes (the genus *Dorylomorpha* is an exception) and the females have dichoptic eyes. The frons is always narrow and in most cases without bristles, however members of the subfamily Chalarinae have frontal bristles.

The ocelli are present, forming an ocellar triangle, usually without bristles (Chalarinae is an exception). The antennae consist of three segments (scape, pedicellus, flagellum), the third being the largest bearing an arista. The face is usually narrow, greyish pollinose. The mouthparts are muscoid type (labellum) specialised to feed on liquid (honeydew). The occiput can be silvery pollinose or shining in upper part and if hairs are present, they are always short.

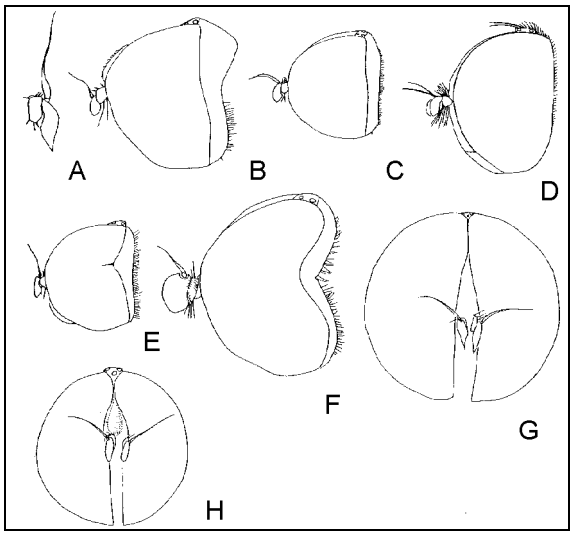


Fig. 9. Pipunculidae heads. – A: *Eudorylas mutillatus*, antenna; B: *Collinias* sp., lateral view; C: *Pipunculus hertzogi*, lateral view; D: *Jassidophaga* sp., lateral view; E: *Protonephrocerus chiloensis*, lateral view; F: *Nephrocerus daeckei*, lateral view; G: *Dasydorylas eucalypti*, front view; H: *Collinias* sp., front view (after Skevington's thesis)

Thorax

As in most Diptera, the mesothorax forms almost exclusively the thorax, since the other two segments (pro- and metathorax) have been reduced (Fig. 10.). This is due to the fact that one pair of wing is present and muscles attached to it fill the whole volume of the thorax.

Important characters can be found on the mesonotum (also called antepronotum) and on the propleuron, (remaining part of the first thoracic pleuron) and the scutellum (it can be bare, hairy or setulose).

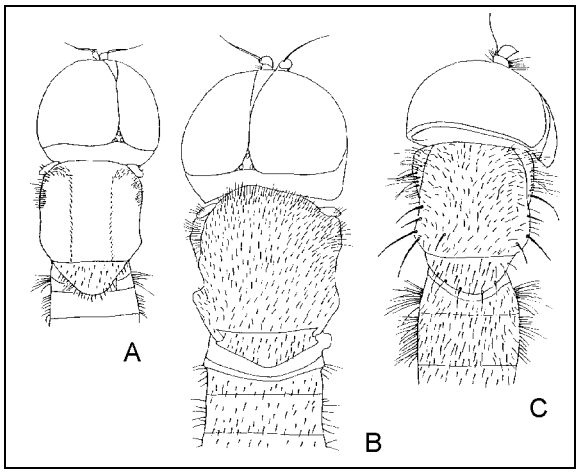


Fig. 10. Pipunculid thoraces in dorsal view. – A: *Dasydorylas eucalypti*; B: *Pipunculus viduus*; C: *Jassidophaga* sp. (after Skevington's thesis)

Legs

The six legs are usually covered with rows of hairs, which can be reduced, absent or exaggerated (Fig. 11.). The character descriptions refer to the third leg, since this shows generally all features, but more expressed than the other two pairs. The trochanter (usually the third) may have important hairs (sometimes even spines in *Pipunculus*) or special projection (as in *Tomosvaryella*). The femora may be inflated and may or may not bear rows of ventral spines (*Pipunculus*, *Tomosvaryella*). Hind tibiae can be thickened in the middle and anteromedial hairs can be present, which is characteristic of *Dasydorylas*.

There are five tarsal segments (the first segment is always longer) and the fifth has two claws, two pulvilli and a filiform empodium in the middle.

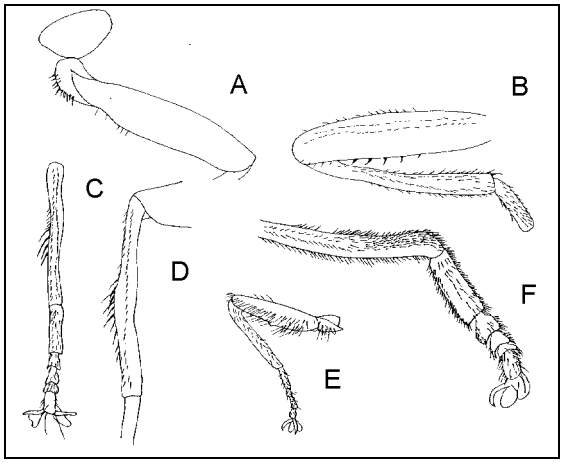


Fig. 11. Pipunculidae leg types. – A: *Cistoabdominalis helluo*, anterolateral view; B: *Eudorylas mutillatus*, anterolateral view of mid leg; C: *Cephalops cochleatus*, dorsal view of hind tibia and tarsi; D: *Claraeola cyclohirta*, anterodorsal view of hind tibia; E: *Jassidophaga* sp., posterolateral of mid leg; F: *Amazunculus claripennis*, dorsal view of hind tibia and tarsi (after Skevington's thesis)

Wings

The wings (Fig. 12.) are usually clear or only slightly fumose and wing markings, spots are missing except pterostigma at the third section of the costa (between ends of Sc and R_1); the costa lacks any interruption and it is continuous until the end of M_1. The discal cell (dm) is closed, no spurious vein is present, R_{4+5} and M_1 are approaching each other towards wing tip, but they never meet. The vein M_{1+2} can have an appendix (separate M_1 and M_2, e.g. *Cephalosphaera*) and the anal vein (A_1) may be missing *(Beckerias)*. The cubital vein (Cu_1) and the anal vein always meet before reaching wing margin.

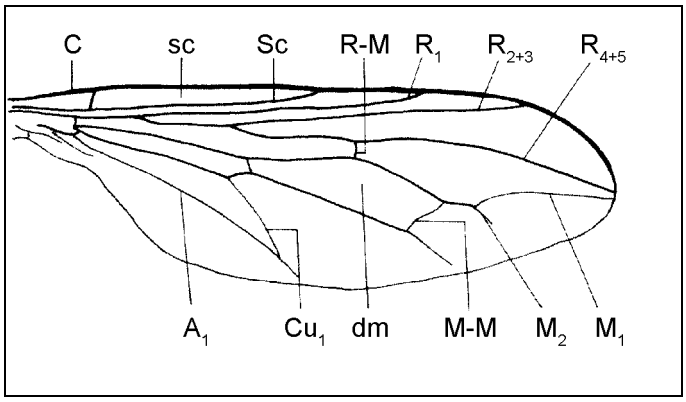


Fig. 12. Pipunculid wing. C: costa, sc: subcostal cell, Sc: subcosta, R-M: radio-medial cross-vein, R: radial vein, M: medial vein, M-M: intermedial cross-vein, dm: dorsal median (discal) cell, Cu: cubital vein, A: anal vein (modified after Kozánek et al. 1998)

Abdomen

The abdomen is divided in Preabdomen (abdominal segments 1 to 5 or 6) and postabdomen (remaining abdominal segments and genital structures). Tergite 1 with lateral fan of hairs or bristles present or absent, sternum 1 present or absent.

Male (Fig. 13.). Preabdomen of 5 segments, broadly or slender shaped; with pilosity present or absent. Postabdominal segments 6 and 7 partly or mainly reduced; sternite 8 and tergite 8 fused (forming syntergosternite 8).

The genitalia of the males in Pipunculidae shows a circumversion (rotation of 360 degrees along longitudinal axis) and a ventroflexion (rotation directed ventrally); they are also asymmetrical (due to deflexion) in ventral view. Thus the dorsal surface of the genitalia can be examined in the ventral view of the abdomen.

An important part of the male genitalia is the epandrium, which is ontogenetically the 9th tergite. This envelops the bilobed hypandrium (HP) and accessory structures, i.e. cerci (CE), surstyli (IS and OS), the outer (OG) and inner gonopods (IG) and the subepandrial sclerite (SES).

In median part of the genitalia in ventral view the trifid phallus (PH) and the phallic guide can be examined. The phallus is a tubiform structure which branches apically into ductuli, party sclerotised, partly membranous. Basally the ejaculatory duct ends in a sperm pump and ejaculatory apodeme (i.e. Fig. 18I). The latter serves as an attachment of the muscles that forces the seminal fluid into the duct. The sperm pump is connected to two testes which are situated in the fifth abdominal segment.

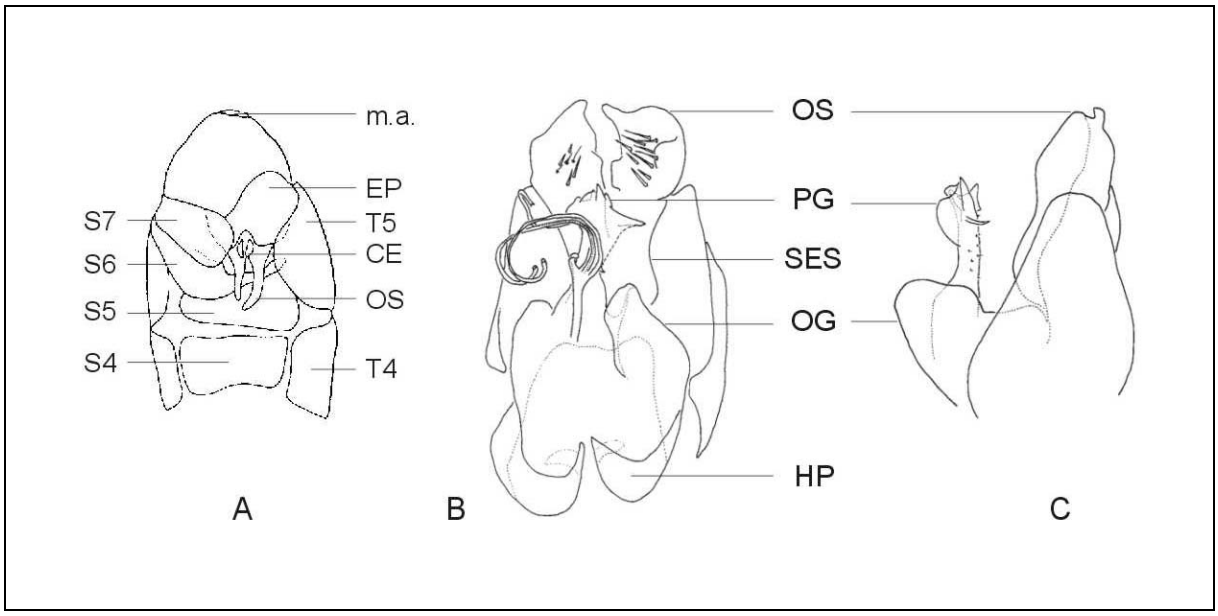


Fig. 13. Pipunculid male postabdomen. A: distal part of the abdomen, ventral view; B: genitalia without ST8, ventral view; C: genitalia in lateral view. (A: modified after Kozánek et al. 1998)

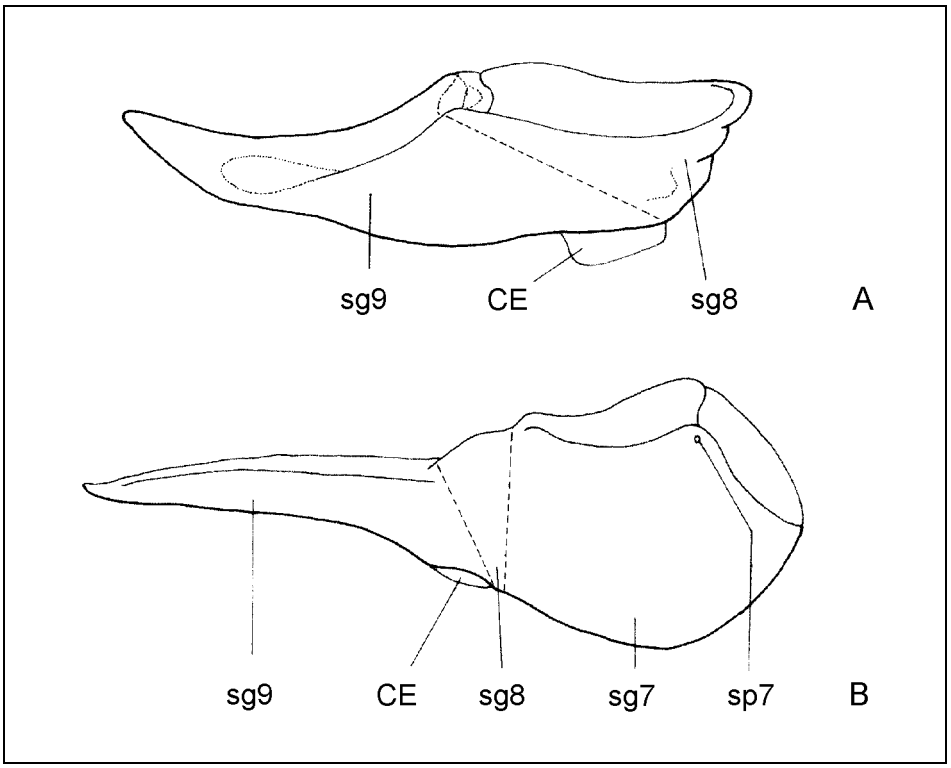


Fig. 14. Pipunculid female postabdomen. A: *Nephrocerus* sp.; B: *Pipunculus* sp. Abbreviations: sg: segment, CE: cercus, sp: spiraculum (modified after Kozánek et al. 1998)

Female (Fig. 14.). Preabdomen 6 abdominal segments present. Postabdomen, tergite and sternite 7 fused as base of ovipositor or they are separate.

The base of the ovipositor usually formed by syntergosternite 7 (suture is still visible in primitive Pipunculidae). The piercer is a sclerotised structure, attached to the base (sg9 on Fig. 14B); dorsally with anal proct and cerci, ventrally with vaginal orifice at the apical part.

Descriptions

Descriptions are as detailed as possible in terms of listing all possible characters that can be helpful for species recognition and differentiation between the species. Thus the descriptions are uniform as well making it easier to compare even single features of more species.

Illustrations

The drawings have been designed for the kind of descriptions outlined above. The most important view were always drawn to better comparison of the species. These six views are the following: genitalia in dorsal view; surstyli in dorsal view, enlarged; lateral view of the outer surstylus; lateral view of the inner surstylus; ventral view of genitalia without ST8 and sperm pump with ejaculatory apodeme.

Abbreviations

The following abbreviations are used throughout the thesis:
alc. – alcohol (ethanol); AT – allotype; CE – cercus, cerci; dm – discal cell; EP – epandrium; f – femur, femora; GP – gonopod(s); GB – gonopodal bridge; HA – hypandrial apodeme; HP – hypandrium; HT – holotype; IG – inner gonopod; OS – outer surstylus; LT – lectotype; m.a. – membranous area; M–Cu – medio-cubital vein; PG – phallic guide; PH – phallus; PLT – paralectotype; PT – paratype; pv – posteroventral(ly); OG – outer gonopod; R–M – radiomedial crossvein; IS – inner surstylus; S – sternite; SS – surstyli; SES – subepandrial sclerite; ST8 – syntergosternite 8; T – tergite; t – tibia, tibiae.

RESULTS AND DISCUSSION

1. Species of the genus *Tomosvaryella*

The West and Central European species of the genus *Tomosvaryella* have been revised based on material provided by the following institutions: HNHM, IPZFA, ISNB, ZMHB, NMSA, KOZ, UMO.

Fourteen species were treated and two of them were described as new to science (*Tomosvaryella magyarica* Földvári et De Meyer and *Tomosvaryella hortobagyiensis* Földvári et De Meyer). We gave detailed descriptions and redescriptions for all species and drawings of the male and female genitalia. We provided an identification key for the fourteen species, including the females.

A new synonym has been proposed for *T. minima* (*T. rondani*) and clear identity of the species has been given.

We designated lectotypes for *T. kuthyi* Aczél, 1944 and *T. cilitarsis* Strobl, 1910 to facilitate species recognition.

Intraspecific variation of the male genitalia was found to be important and some species were illustrated to show the degree of changes. In all cases the differences were found to be continuous and therefore we followed a conservative view of the species concept, and considered all these forms as representatives of the same species. These species were *T. kuthyi, T. magyarica, T. geniculata* as shown on Figs 15-16.

All results were published in Földvári and De Meyer (2000) with 88 drawings.

2. Pipunculidae fauna of Hungary

An investigation has been done on the Pipunculidae fauna of the Aggtelek National Park (Földvári 1999) based on the material of the HNHM collected before by various collectors. During this study we found 24 species and eighteen of them proved to be new for the Hungarian fauna. These species were: *Cephalops aeneus* Fallén, *Cephalops subultimus* Collin, *Cephalops ultimus* (Becker), *Eudorylas fascipes* (Zetterstedt), *Eudorylas fuscipes* (Zetterstedt), *Eudorylas horridus* (Becker), *Eudorylas jenkinsoni* Coe, *Eudorylas obliquus* Coe, *Eudorylas subfascipes* Collin, *Eudorylas subterminalis* Collin, *Eudorylas zonellus* Collin, *Jassidophaga setosa* Verrall, *Jassidophaga villosa* (von Roser), *Pipunculus calceatus* von Roser, *Pipunculus campestris* Latreille, *Pipunculus fonsecai* Coe, *Pipunculus tenuirostris* Kozánek, *Verrallia aucta* (Fallén).

New morphological and faunistic data were added by Földvári and Kozánek (2001) as a result of the revision of the whole Pipunculid collection held in the HNHM. We found altogether one genus and 40 species new to our fauna, which rose the number of species in Hungary to 86.

In addition to this we presented the so far unknown male of *Pipunculus lichtwardti* and the unknown female of *P. omissinervis*. A detailed description has been given for the first time for these species with drawings of genitalia (Fig. 17.).

The critical list of the Hungarian members of this family was presented in the book Checklist of the Diptera of Hungary (Földvári 2001). During this work we gathered all information related to a given species until it had been reliably reported for the first time as part of our fauna. In most of the cases misidentifications, lack of voucher specimens and irrelevant cross references had to be eliminated.

Altogether 58 species out of the now existing 86 have been reported for the first time following our studies on Hungarian Pipunculidae.

3. Faunistic studies of European Pipunculidae

a) *Canary Islands and Madeira*

This study updates the present knowledge of the Pipunculidae (Diptera) of the Atlantic islands of the Canaries and Madeira. In total, 14 species are reported with 13 for the Canary Islands and three for Madeira. *Chalarus perplexus*, *Eudorylas clavatus*, *Tomosvaryella brachybasis*, *T. freidbergi*, *T. glabrum*, *T. kuthyi* and *T. parakuthyi* are reported for the first time from the islands. *Tomosvaryella glabrum*, formerly considered a synonym of *T. subvirescens*, is re-instated as a separate species with *T. tecta* as a junior synonym. *Tomosvaryella ornatipes*, formerly considered a synonym of *T. frontata* is re-instated as a separate species. Aspects on endemism, inter-island variation, zoogeographical affinities, and seasonality of the pipunculid fauna of these Atlantic islands are briefly discussed. All results and discussion were published in De Meyer, Földvári and Báez (2000).

b) *Denmark*

We studied Danish Pipunculidae as part of the survey on Diptera of Denmark in Copenhagen (ZMUC). Careful check of the collection provided a list of 79 pipunculid species expected to occur in Denmark, and we found reliable records for 62 of them. This list was published in Földvári, Dempewolf and Petersen (2001).

4. Taxonomy of the tribe Eudorylini in the Afrotropical Region

a) *Revision of the genus* **Claraeola** *Aczél, 1940*

Claraeola Aczél, 1940: 151. Type species: *Dorylas adventitius* Kertész, 1912, by original designation.

Congomyia Hardy, 1949*b*: 7. Type species: *Congomyia nigripennis* Hardy, 1949, by original designation. Syn.: Skevington and Yeates (2001): 429.

Moriparia Kozánek & Kwon, 1991: 77. Type species: *Moriparia nigripennis* Kozánek & Kwon, 1991, by original designation. Syn.: Skevington and Yeates (2001): 429.

Diagnosis – Pedicel often with at least 5 dorsal and 5 ventral bristles; tegula with cluster of setae; notopleuron with dense bush of long setae hind tibia with erect anteromedial setae over half or more of length; femora often with posterodorsal row of long, black setae; pterostigma present; third costal section usually very long (at least twice as long as the fourth); vein M2 present or absent; tergite 1 with patch of setae laterally; tergite 2 with lateral setae as long as setae on tergite 1, usually with long setae along lateral margins of all abdominal terga; tergite 7 often present as a distinct band; ST8 with membranous area; hypandrium swollen, gonopods usually asymmetrical, outer gonopod protruding; phallic guide usually deflected distally by over 45°, narrow, no wider than deep; phallus trifid or single, with subapical protuberance covered with specialised scale-like setae, protuberance often free from phallus for most of length; basal half of phallus often with strong bend before separating into 3 ducts; ejaculatory apodeme usually linear.

Claraeola francoisi (Hardy, 1952)

(Figs 18A–D)

Dorilas (Cephalosphaera) francoisi Hardy 1952: 3.

Diagnosis: GP long, asymmetrical, with hairy projections, PG short, curved and pointed at tip.

Type material: **Burundi:** 1 male, HT [damaged], Urundi, Rumonge, alt. 780 m, 20-ii-1949, F. François, R. I. Sc. N. B., I.G. 19.700 (ISNB).

Male

Head. Third antennal segment acuminate; dark brown. Face silvery pollinose. Frons, upper part subshining black, lower part silvery pollinose with small shining black spot in the middle; eyes touching for distance equal to 2.5 times ocellar triangle. Occiput, lower half silvery pollinose, upper half more brownish.

Thorax. Humeri dark brown. Mesonotum (viewed obliquely from front) subshining black, along anterior margin more greyish; brownish pollinose from the side. Scutellum brown, without hairs. Dorsocentral hairs very weakly developed. Halter pale brown.

Legs. Completely brown except yellow knees and basal ¼ of tibiae. Ventroapical row of 6-8 dark spines on f2 (only f2 remained on HT). Subapical (distal) spines on first four tibiae missing. Pulvilli as long as last tarsal segment.

Wing *(missing on HT)*.

Abdomen (completely dissected).

Genitalia

Specimen damaged, no dorsal views drawn, IS broken. Surstyli asymmetrical, OS broader; ST8 not seen. Borders of SES *uncertain*; gonopods asymmetrical, both with projections and minor hairs;

phallic guide short, as long as OG, slightly curved and pointed at tip; phallus trifid, with supporting structure; ejaculatory apodeme vase-shaped; sperm pump round.
Female – Unknown.
Remarks – The HT is seriously damaged, therefore the description is incomplete. It is most likely a *Dasydorylas* according to Skevington and Yeates (2001), and it has been left in this genus until more complete specimens can be found.
Distribution – Burundi.

Claraeola hadrosoma (Hardy, 1962)

(Figs 18E–J)

Pipunculus (Eudorylas) hadrosoma Hardy 1962: 262.

Diagnosis: OS with a broad base in lateral view, SES clear, with distinct hairs, GP asymmetrical, PG broad, with pointed tip and membranous structures bearing scale-like hairs.

Type material: **Madagascar:** 1 male, HT, Centre Anjavidilava, 2020m, Andringitra Ambalavao, 17-21.I.58, B. Stuckenberg (MNHN).

Male
Head. Third antennal segment acuminate; yellow. Face silvery pollinose. Frons, upper part shining black, lower part silvery pollinose; eyes touching for distance equal to 4 times ocellar triangle. Occiput, upper half brownish, lower half silvery pollinose.
Thorax. Humeri yellow. Mesonotum (viewed obliquely from front) brownish pollinose; more silvery from the side. Scutellum brown, with 8-10 hairs as long as width of t1 at base. Dorsocentral hairs short, but visible. Halter brown.
Legs. Trochanters and base of femora yellow-brown, femora brown dorsally on basal half otherwise yellowish brown (posterior surface of f1,2 silvery pollinose, f3 shining dark brown), knees, tibiae yellow, hind tibia clearly bent. Tarsal segments yellow, last segment brown. Ventroapical row of 6-8 short spines on first four femora; 8-10 spines on 3rd femur, somewhat longer. Subapical (distal) spines on first four tibiae present. No anteromedial hairs on 3rd tibia. Hind trochanter with at least 20-25 hairs on ventral side as long as half the width of first tarsus at base. Pulvilli as long as last tarsal segment.
Wing. Fourth costal section as long as third costal section. Cross-vein R-M beyond 2/5 of discal cell. Pterostigma fully coloured. Four-five dark hairs on tegula.
Abdomen. Tergites viewed obliquely from front brownish pollinose (including hind margins), sides slightly greyish. Hairs dispersed and pale, but longer and stronger on sides of T5. Laterally patch of 12-14 black bristles on first tergite. Postabdomen in dorsal view: S7 visible; T5 as long as ST8. Genitalia without dissection: ST8 large, m.a. small (1/3 of width of ST8), EP elongated, SS with finger-like processes.
Genitalia
Surstyli asymmetrical IS longer, with projection, OS with a broad base in lateral view (maybe part of SES). Borders of SES clearly visible with distinct hairs; gonopods asymmetrical, OG longer; phallic guide broad and in lateral view with pointed tip and membranous parts with scale-like hairs; phallus trifid with membranous supporting structure; ejaculatory apodeme fan-shaped; sperm pump linear.
Female – Unknown.
Distribution – Madagascar.

Claraeola nigripennis (Hardy, 1949)

(Figs 19A–F)

Congomyia nigripennis Hardy 1949*b*: 7.

Diagnosis: Large species, wings dark brown. EP small, a.m. wide, SES well developed hairy, PG pointed, with minute hairs just below apex, phallus trifid with apical projection covered by scale-like setae.

Type material: **Democratic Republic of Congo:** 1 male, HT, Congo-belge, Eala - III. - 1936, J. Ghesquière, R. Mus. Hist. Nat. Belg. I.G.10.482 (ISNB).

Other material examined: **Democratic Republic of Congo:** 1 male, Kasai: Terr. de Dekese Itunda, XII. 59, F.J. François, R. I. Sc. N. B., I.G. 24.452 (ISNB). **Cameroon:** 1 male, Mission Cameroun, CNRS, RCP 318, Octobre Novembre 1975, Bafut Nguemba (Vallee de la Haute Nguemba), Province du Nord-Ouest, 3.XI.1975, "Eudorylas sp. det. J. Skevington /98" (MNHN).

Male
Head. Third antennal segment obtuse, dark brown, pedicel with strong black bristles ventrally and dorsally. Face and frons brownish pollinose (also in front of ocellar triangle); eyes touching for distance equal to 2.5 times ocellar triangle. Occiput, lower half silvery pollinose along the edges, otherwise and upper half subshining black.
Thorax. Humeri dark brown. Mesonotum (viewed obliquely from front) brownish pollinose, also brownish from the side, notopleural depression with numerous dark hairs. Scutellum brown, with few pale hairs. Dorsocentral hairs well developed. Halter dark brown.
Legs. Trochanters, femora, knees and tibiae dark brown. Tarsal segments yellow brown, last segment darker (f1,2 silvery pollinose pv). Tarsi of the 3rd leg flattened. Ventroapical row of 5-8 short, black spines on all femora (small compared to the size of the specimen), all femora with a row of hairs (posteriorly) at least as long as width of femora at base. Subapical (distal) spines on first four tibiae missing. The anteromedial hairs slightly erected along distal half of the 3rd tibia. Hind trochanter with 6-10 short, dark spines on ventral side. Pulvilli distinctly shorter than last tarsal segment.
Wing. Dark brown, fumose (may be paler, shorter). Fourth costal section 0.5-0.8 times as long as third costal section. Cross-vein R-M at 2/5 of discal cell. Pterostigma fully coloured. Hairs on tegula uncertain.
Abdomen (already dissected). (based on specimen from Kasai) Viewed obliquely from front tergites 2-4 subshining-shining black, T1 silvery pollinose dorsally. Hairs dispersed, short and weakly developed in general. Laterally longer dark hairs (20-25) on first and second tergite as long as width of t3 at base.
Genitalia
Surstyli rectangular, IS larger (up to twice as large as OS); epandrium small compared to ST8, which bears a wide m.a., as large as ¾ of width of ST8 (may be smaller). SES well developed, with many hairs on both sides (cf. drawing); gonopods asymmetrical, IG small, round, OG larger, more rectangular; hypandrium broad; phallic guide pointed apically, with minute hairs below apex (also on dorsal side); phallus trifid with apical projection covered by scale-like setae; ejaculatory apodeme (based on specimen from Cameroon) linear, flat; sperm pump small, round, with two patches of hairs.
Female – Unknown.
Distribution – Democratic Republic of Congo.

Claraeola sicilis Skevington, 2002

(Figs 19G–K)

Claraeola sicilis Skevington 2002: 149.

Diagnosis: Surstyli subsymmetrical, broad in lateral view; cerci elongated; ST8 large, with circular m.a.; OG round, IG slightly pointed; phallic guide with two apical projections in ventral view; tubes of the phallus very short.

Other material examined: **Malawi:** 1 male, 5km E. of Mzuzu, 6.iii.1987, J&A Londt, Roadside woodland with very long grass (BMNH). **South Africa:** 1 male, Enon Farm, Richmond, Natal, S. Africa, B. & P. Stuckenberg, Jan 1964 (BMNH).

Male
Head. Third antennal segment obtuse; dark brown. Face silvery pollinose. Frons, upper part subshining black, lower part black pollinose except drop-shaped shining spot in the middle; eyes touching for distance equal to 4-5 times ocellar triangle. Occiput, lower half silvery pollinose, upper half subshining black.

Thorax. Humeri dark brown. Mesonotum (viewed obliquely from front) brownish pollinose; subshining black from the side. Scutellum brownish pollinose, with 7-9 pale hairs. Dorsocentral hairs weakly developed. Halter dark brown.
Legs. Entirely black (hind femora shining pv). Ventroapical row of spines on femora missing. Subapical (distal) spines on first four tibiae missing. No anteromedial hairs on 3rd tibia. Hind trochanter with 4-6 short whitish hairs on ventral side. Pulvilli distinctly shorter than last tarsal segment.
Wing. Fourth costal section 0.3-0.4 times as long as third costal section. Cross-vein R-M beyond 2/5 of discal cell. Cross-vein M-M concave. Pterostigma fully coloured. Hairs on tegula uncertain.
Abdomen. Viewed obliquely from front tergites entirely subshining black with stripes. Hairs dispersed, pale and long (as long as width of tibia at widest). Laterally spines on first tergite missing only hairs are present as on T2 and T3. Postabdomen in dorsal view: T5 2.2-2.3 times as long as ST8. Genitalia without dissection: ST8 brownish pollinose, with round m.a., occupying 2/3 of width of ST8, SS and EP dark brown, SS perpendicular to body on ventral side.
Genitalia
Surstyli subsymmetrical, broad in lateral view; epandrium with deep V-shaped form around elongated cerci; ST8 large, with circular m.a. SES uncertain; gonopods very short, OG round, IG slightly pointed; phallic guide with two apical projections in ventral view, somewhat bent towards SS in lateral view; phallus trifid, tubes very short, laterally hairy at base in ventral view.
Remarks – Only known from Australia so far based on Skevington's (2002) description.
Distribution – Australia, Malawi, South Africa.

b) *Revision of the genus* **Clistoabdominalis** *Skevington, 2001*

Clistoabdominalis Skevington in Skevington & Yeates, 2001: 435. Type species: *Pipunculus helluo* Perkins, 1905, by original designation.

Diagnosis – Pedicel with very short bristles, pterostigma usually present. Distal tibial spines often present on front and mid tibiae. Tergite 1 with lateral fan of setae absent or minute, tergite 6 often with lateral protuberances, membranous area of ST8 usually absent, phallus trifid, ejaculatory apodeme usually funnel- shaped or three-sided, very large, with a swollen basal rosette. For more details see Skevington & Yeates (2001).

Clistoabdominalis confusoides (Lamb, 1922)

(Figs 20A–E, 55F)

Pipunculus confusoides Lamb 1922: 412.
Dorylomorpha lini Hardy 1972: 81. - syn.: De Meyer 1995*b*: 288.

Diagnosis: The basally situated cross-vein, the missing (or at least extremely reduced) pterostigma and the separated eyes in males make this species also very special. GP weakly developed, PG with small protuberances in ventral view.

Type material: **Seychelles:** 2 males, 1 female, LT and 2 PLT, Mahe, '08-9., Seychelles Exp.; Seychelles Is., Pres by Percy Sladen Trust Cttee., B.M. 1922-157. (all BMNH). **Philippines:** 1 female [AT of *D. lini*], Philippines: Palawan, 13km N of Puerto Princesa, 18.IV.1968, [hand-written:] "ex grass", D.E. Hardy Collector; 1 male [PT of *D. lini*], ibid. (both BPBM). **Taiwan:** 1 male [PT of *D. lini*], "CHINA: N. TAIWAN, sweeping [on rice], Taipei, 26.VI.1969, [leg.] KSLin", [separate label:] "# 8a" (BPBM).

Male
Head. Third antennal segment acuminate; brownish yellow. Face silvery pollinose. Frons pollinose on lower 1/3, otherwise shining black; eyes do not touch. Frons at least as wide as largest ommatidium at narrowest point. Occiput, lower half silvery pollinose, upper half brownish.
Thorax. Humeri yellow. Mesonotum (viewed obliquely from front) subshining black; silvery pollinose from the side. Scutellum subshining black, without hairs. Dorsocentral hairs short, pale. Halter yellow.
Legs. Trochanters and femora brown, basal 1/3 of tibiae yellow, otherwise brown. Tarsal segments yellow-brown, last segment brown. Ventroapical row of 5-6 very short, black spines on f2; no spines on other femora. Subapical (distal) spines on first four tibiae present. No anteromedial hairs on 3rd tibia. Hind trochanter without hairs or spines on ventral side. Pulvilli shorter than last tarsal segment.
Wing. Fourth costal section 2 times as long as third costal section. Cross-vein R-M at 1/5-1/6 of discal cell. No pterostigma can be observed on ST (slightly darker in the distal corner of third costal section). One hair on tegula.
Abdomen (already dissected). Viewed obliquely from front first two tergites completely silvery pollinose. Laterally 1-2 minute pale hairs on first tergite.
Genitalia
Surstyli small, OS bent outwards; epandrium as long as wide; ST8 broad. SES *uncertain*; gonopods weakly developed, small; hypandrium deflected in ventral view; phallic guide *uncertain* in lateral view, and with small protuberances in ventral view; phallus very thin; ejaculatory apodeme broad at tip; sperm pump small, globular, phallic sheath present.
Female
As male except for the following characters. Frons, eyes separated; silver-grey pollinose on lower 1/3, otherwise shining black (the black part is V-shaped). Pulvilli and claws about as long as last tarsal segment. Female ovipositor on Fig. 55F.
Remarks – Based on the male genitalia this species belongs to *Clistoabdominalis*, although the pterostigma seems to be missing or at least extremely reduced. One of the male syntypes is selected here as lectotype to establish an unambiguous species concept.
Distribution – Reunion Island, Seychelles Islands, India, Philippines, Taiwan, Thailand, Israel, Japan.

Clistoabdominalis crassus (Bezzi, 1926)

(Figs 20F–K, 55J)

Pipunculus crassus Bezzi in Bezzi and Lamb 1926: 550.

Diagnosis: Only one male specimen is known, therefore genital characters are uncertain. Surstyli with protuberances at base, SES not developed; gonopods not clear, hypandrium deflected in ventral view and a sclerite seems to be attached to it.

Type material: **Mauritius:** 1 male, LT, Rodriguez I., viii-ix. 1918, HP Tommasset and HJ Snell; [separate label:] Rodriguez I., Pres by Dr H Scott, BM 1926-190; 1 female, PLT, same data as LT (BMNH).

Male
Head. Third antennal segment acuminate; brown, tip whitish. Face silvery pollinose. Frons, upper part shining black, lower part silvery pollinose; eyes touching for distance equal to 2 times ocellar triangle. Occiput brownish pollinose.
Thorax. Humeri yellow-brown. Mesonotum (viewed obliquely from front) and scutellum subshining (but surface is greasy); mesonotum brownish (slightly pollinose) from the side. Scutellum with 2-3 very weakly developed hairs. Dorsocentral hairs weakly developed. Halter yellow, stem darker.
Legs. Trochanters and femora brown, f1,2 posteriorly silvery pollinose; knees, tibiae and tarsal segments yellow, last segment brown. Ventroapical row of spines missing on femora. Subapical (distal) spines on first four tibiae present. No anteromedial hairs on 3rd tibia. Hind trochanter with a row of 10-12 dark spines (as a comb) on ventral side. Pulvilli shorter than last tarsal segment.
Wing. Cross-vein R-M at 2/5 of discal cell. 4/5 of pterostigma coloured. Hairs on tegula absent.

Abdomen. Tergites black with brownish pollinosity (without any grey colour). No hairs on abdomen, no lateral spines on first tergite (may be broken). Postabdomen in dorsal view: EP visible; T5 0.8 times as long as ST8. Genitalia without dissection: no m.a., SS yellow.
Genitalia
Surstyli with protuberances at base; ST8 large, but damaged. SES not developed; gonopods not clear, the pointed structure in the middle must be the PG; hypandrium deflected in ventral view and a sclerite seems to be attached to it; phallus *uncertain*, may be lost on HT; ejaculatory apodeme mushroom shaped; sperm pump funnel-like.
Female
As male except for the following characters. Frons, eyes separated; silver-grey pollinose on lower 1/3 and along the margins up to the middle, otherwise shining black. Subapical (distal) spines on first four tibiae very distinct. Pulvilli and claws about 1.5 times as long as last tarsal segment. Female ovipositor (Fig.) with thin, slightly upcurved piercer.
Remarks – Hereby I designate a lectotype for this species by choosing the male specimen of the two syntypes.
Distribution – Mauritius.

Clistoabdominalis lomholdti Földvári, 2003

(Figs 21A–F, 55E, L)

Clistoabdominalis lomholdti Földvári, 2003: 169.

Diagnosis: Third antennal segment whitish yellow, arista black. Scutellum silvery pollinose, with 7-8 pairs of strong hairs; f3 much thicker than others and curved. Hind trochanter triangle shaped, with 8-10 white hairs. Surstyli with broad base and narrow tip; SES on both sides with a patch of hairs; gonopods asymmetrical, OG longer; sides of phallic guide parallel, tip rounded; ejaculatory apodeme and sperm pump parachute-like (as in *E. flexus*).

Type material: **Namibia:** 1 male, HT, South West Africa, Gobabeb 26.I.1978, Kuiseb River Bed, O. Lomholdt leg.; 1 male, PT, same data; 1 female, PT, South West Africa, Rooibank, 7.II.1978, Kuiseb River, small dunes with bushes, O. Lomholdt leg. (all ZMUC).

Male
Head. Third antennal segment acuminate; whitish yellow, arista black. Face silvery pollinose. Frons, upper part shining black, lower part silvery pollinose; eyes touching for distance equal to 2 times ocellar triangle (on male PT eyes are not touching). Occiput, greyish pollinose.
Thorax. Humeri yellow. Mesonotum (viewed obliquely from front) silvery pollinose; also from the side. Scutellum silvery pollinose, with 7-8 pairs of strong hairs. Dorsocentral hairs well developed. Halter yellow, base of stem brown.
Legs. Trochanters and base of femora yellow, femora yellow with brown markings on distal half, f3 much thicker than others. Knees, tibiae yellow, hind tibia more curved than in most of the species. Tarsal segments yellow, last segment brown. Ventroapical row of 9-12 short, black spines on f2; only whitish hairs on 3rd femur. Subapical (distal) spines on first four tibiae present. No anteromedial hairs on 3rd tibia. Hind trochanter triangle shaped, with 8-10 white hairs on ventral side as long as width of tibia at base. Pulvilli shorter than last tarsal segment.
Wing. Fourth costal section as long as third costal section. Cross-vein R-M at 1/3 of discal cell. Pterostigma fully coloured. No hairs on tegula.
Abdomen. Viewed obliquely from front tergites silvery pollinose, ST8 more brown in ground colour, sides more greyish. Hairs dispersed, as long as width of t3 at base, on T2 somewhat longer. Laterally 1-3 pale hairs on first tergite. Postabdomen in dorsal view: T6, S7 or EP not visible; T5 0.7 times as long as ST8. Genitalia without dissection: very large ST8, no m.a., EP+SS completely yellow.
Genitalia

Surstyli with broad base and narrow tip; ST8 enlarged. Borders of SES *uncertain*, on both sides with a patch of hairs; gonopods asymmetrical, OG longer; sides of phallic guide parallel, tip rounded; phallus trifid, branches pointed; ejaculatory apodeme and sperm pump parachute-like (as in *E. flexus*).
Female
As male except for the following characters. Frons, eyes separated; probably silver-grey pollinose (greasy on PT) except in front of ocellar triangle for length equal to 2 times the triangle. Femora slightly thickened, form of trochanters moderately modified, t3 less curved than in male. Pulvilli and claws about 1.5 times as long as last tarsal segment. Female ovipositor (Fig. 55E, F) with modified S6 to receive it, base visible, not enlarged, without protuberances.
Distribution – Namibia.

Clistoabdominalis namibiensis sp. n.

(Figs 21G–L, 54N–O)

Diagnosis: The species is unique, because of the flat, spiny lobe of the OG and the visible S7. Other special features are the two subapical (distal) spines on mid tibiae of both sexes and the cross-vein R-M being placed at 1/5 of the discal cell.

Type material: **Namibia:** 1 male, HT [# T645], Omaruru dist[rict], Ugab R[iver] n[ea]r Brandberg Wes[t], 20°57’39’’S 14°07’55’’E, 21-24.x.1998, Kirk-Spriggs & Marais, Malaise trap sample; 1 female, AT, same data as HT (both NMNW); 1 male, 1 female, PTs, same data as HT (both HNHM); 1 female, PT, Khorixas district, Huab River, Krone 721, 20°37’09’’S 13°54’31’’E, 23-26.x.1998, Kirk-Spriggs & Marais, Malaise trap (NMNW).

Male
Head. Third antennal segment acuminate; yellow, whitish towards tip. Face silvery pollinose. Frons, upper part shining black, lower part silvery grey; eyes touching for distance equal to 2-2.5 times ocellar triangle. Occiput silvery pollinose.
Thorax. Humeri pale yellow. Mesonotum (viewed obliquely from front) silvery pollinose, also from the side. Scutellum grey, hairs missing. Dorsocentral hairs distinct. Halter whitish yellow, brown at base of stem.
Legs. Trochanters and base of femora yellow brown, femora yellow with darker ring in the middle (3/5), knees and tibiae yellow. Tarsal segments yellow, last segment brown. Ventroapical row of 6-7 tiny, dark spines on mid femora only. Subapical (distal) spines on first four tibiae present (two spines on t2). One very weak anteromedial hair on 3rd tibia. Hind trochanter with a few short, pale hairs on ventral side. Pulvilli as long as last tarsal segment.
Wing. Fourth costal section as long as third costal section. Cross-vein R-M at 1/5 of discal cell. Pterostigma fully coloured. Hairs on tegula missing.
Abdomen. Viewed obliquely from front tergites brownish pollinose, with grey patches laterally in dorsal view, hind margins brown (distal 1/3 of T5 silvery pollinose), sides greyish. Hairs dispersed, short and weakly developed. Laterally 2-3 short spines on first tergite. Postabdomen in dorsal view: S7 visible; T5 as long as ST8. Genitalia without dissection: the whole postabdomen yellow-brown, ST8 swollen, m.a. slit-like, oblique.
Genitalia
Surstyli asymmetrical, IS larger; epandrium broad, U-shaped around cerci; ST8 enlarged. SES clearly developed, without distinct hairs; gonopods highly asymmetrical, OG bearing a broad, flat, spiny lobe, IG hump-like; lobes of hypandrium rectangular; phallic guide with parallel sides, narrowing at tip; phallus trifid, with supporting membranous structures, branches pointed at tips; ejaculatory apodeme triangle shaped; sperm pump flat, with two projections.
Female
As male except for the following characters. Frons, eyes separated; silver-grey pollinose on lower half otherwise shining black. Pulvilli and claws about 1.5-2 times as long as last tarsal segment. Female ovipositor (Fig. 54N–O): base enlarged, hemispherical, yellow-brown; S6 modified to receive piercer.
Distribution – Namibia.
Etymology – The species is named after the African country Namibia.

c) *Revision of the genus* **Dasydorylas** *Skevington, 2001*

Clistoabdominalis Skevington in Skevington & Yeates, 2001: 435. Type species. *Pipunculus eucalypti* Perkins, 1905, by original designation.

Diagnosis – Pterostigma present; notopleuron often with dense bush of long setae; scutellum often with well developed fringe of long setae; front femur usually with rows of ventral; femora usually with posterodorsal row of long, black setae; distal tibial spines present on front and mid tibiae; tegula usually with cluster of setae; ST8 with membranous area; surstyli usually turned up distally at 90°; subepandrial sclerite usually with dense setae at connection with surstyli; hypandrium often with cluster of anteromedial bristles; phallic guide usually narrow, no wider than deep; phallus trifid; ejaculatory apodeme usually funnel-shaped; sperm pump usually vase-shaped, with lateral flange around entire upper surface

Dasydorylas africanus (Lindner, 1956)

(Figs 22A–F)

Dorylas africanus Lindner 1956: 50.

Diagnosis: The wing's fourth costal section is 0.4 times as long as third costal section. Three to four erect anteromedial hairs on 3rd tibia. ST8 enlarged compared to epandrium, m.a. broad; phallic guide has parallel sides in ventral view, slightly curved and pointed in lateral view; phallus with teeth on one of the branches.

Type material: **Tanzania:** 1 male, HT, Msingi, 22.-28.I.1952, D.O. Afrika Exp. [collected by E. Lindner] (SMNS).

Other material examined: **Kenya:** 1 male, N. Nairobi, Karura Forest, 1°14'S, 36°50'E, 5,500 ft., 15.i.1972, C.F. Huggins, B.M. 1972–468 (BMNH).

Male

Head. Third antennal segment acute; dark brown. Face brownish pollinose. Frons, upper part shining black, lower part brownish pollinose along margins, shining black in the middle; eyes touching for distance equal to 4 times ocellar triangle. Occiput, lower half brownish pollinose, upper half subshining black.

Thorax. Humeri black. Mesonotum (viewed obliquely from front) brownish pollinose; also brownish from the side. Scutellum brown, with 6-7 pairs of pale hairs. Dorsocentral hairs weakly developed, notopleuron with several pale setae. Halter black stem slightly paler.

Legs. Entirely dark brown, black (f3 shining posteroventrally). Ventroapical row of 4-8 short, dark spines on first four femora; no spines or hairs on 3rd femur; f2 with a distinct row of 15-17 brown hairs posteriorly (as long as width of femur at base). Subapical (distal) spines on first four tibiae missing. Three to four erect anteromedial hairs on 3rd tibia. Hind trochanter with 5-6 pale hairs on ventral side. Pulvilli shorter than last tarsal segment.

Wing. Brownish in general; fourth costal section 0.4 times as long as third costal section. Cross-vein R-M well beyond 2/5 of discal cell. Pterostigma fully coloured. Hairs on tegula missing.

Abdomen. Viewed obliquely from front tergites completely black with brownish pollinosity, abdomen narrows distally. Hairs missing, laterally 3-4 black hairs on first tergite. Postabdomen in dorsal view: T5 3 times as long as ST8. Genitalia without dissection: small, black; m.a. as wide as 2/3 of width of ST8.

Genitalia

Surstyli almost symmetrical; ST8 enlarged compared to epandrium, m.a. broad. SES *uncertain*; gonopods subsymmetrical; hypandrium with broadened lobes, apodeme visible; phallic guide with

parallel sides in ventral view, slightly curved and pointed in lateral view; phallus trifid with teeth on one of the branches and with membranous supporting structure; ejaculatory apodeme short, linear; sperm pump round.
Female – Unknown.
Remarks – Formerly listed as generically unplaced Pipunculidae in De Meyer 1996.
Distribution – Tanzania, Kenya.

Dasydorylas bodocsi sp. n.

(Figs 22G–K)

Diagnosis: Surstyli slightly asymmetrical, strongly bent ventrally, OS with a basal process. SES with numerous thick hairs; gonopods pointed, OG with a lobe medially; hypandrium short, rounded; phallic guide in ventral view: broad, sides parallel, narrowing towards tip, with a pointed projection on the left side; phallus trifid, branches short.

Type material: **Zimbabwe:** 1 male, HT, N. Vumba, S. Rhodesia, 22.7.1964, D. Cookson [hand-written] (BMNH); 2 males, PTs, same data as HT except 16.5.1964 (HNHM) and 9.7.1964 (BMNH). **South Africa:** 1 male, PT, N Province #57, Behind Cloud's End Hotel, 23°00'S:29°55'E, 3500 ft, Date: 21.xi.1997, Coll: Barraclough & James, Mixed woodland with stream (BMNH).

Male
Head. Third antennal segment acuminate; brown. Face silvery pollinose. Frons, upper part subshining black, lower part silvery pollinose, except tiny shining black spot in the middle; eyes touching for distance equal to 3.5-4 times ocellar triangle. Occiput, lower half silvery pollinose, upper half brownish pollinose.
Thorax. Humeri pale brown. Mesonotum (viewed obliquely from front) brownish pollinose, along anterior margin more black; brownish pollinose from the side. Scutellum brownish pollinose, with 6-8 very short, pale hairs. Dorsocentral hairs weakly developed. Halter dark brown.
Legs. Trochanters and base of femora brown, femora dark brown (hind femur shining posteriorly), knees, tibiae and tarsal segments yellowish brown, last segment brown. Ventroapical row of 6-8 short, dark spines on mid femora; no spines on 1st and 3rd femur. Subapical (distal) spines on first four tibiae present. One anteromedial hair on 3rd tibia. Hind trochanter with a row of 10-12 pale hairs on ventral side. Pulvilli distinctly shorter than last tarsal segment.
Wing. Fourth costal section 2-2.2 times as long as third costal section. Cross-vein R-M beyond 2/5 of discal cell. Pterostigma fully coloured. Hairs on tegula present (1-2).
Abdomen. Viewed obliquely from front tergites completely brownish pollinose, sides of T1 silver-grey. Hairs dispersed, short and weakly developed. Laterally 3-4 dark spines on first tergite. Postabdomen in dorsal view: S7 and edge of EP visible; T5 as long as ST8. Genitalia without dissection: ST8 brownish pollinose, with slit-like m.a., EP and SS yellow.
Genitalia
Surstyli slightly asymmetrical, strongly bent ventrally, OS with a basal process; epandrium elongated, longer than ST8 in dorsal view. SES with numerous thick hairs; gonopods pointed, OG with a lobe medially; hypandrium short, rounded; phallic guide in ventral view: broad, sides parallel, narrowing towards tip, with a pointed projection on left side; phallus trifid, branches short.
Distribution – Zimbabwe, South Africa.
Etymology – Named after my friend, Róbert Bödőcs, who helped me in various cases during this revision.

Dasydorylas evanidus (Hardy, 1949)

(Figs 23A–F, 55V–W)

Dorilas evanidus Hardy 1949*a*: 31.
Dorilas (Eudorylas) dorsalis Hardy 1950: 26, **proposed new synonymy.**
Dorilas (Eudorylas) apiculatus Hardy 1961: 133, **proposed new synonymy.**

Diagnosis: Fourth costal section very short (0.5 times the length of C3). All tibiae with a dark spine anteromedially (sometimes only short hairs present). The m.a. on ST8 is an elongated ellipse (either as a depression or as a keel). Surstyli subsymmetrical with an appendage each on the side. 10-12 small spines at the base of both SS (or SES); phallic guide pointed, laterally bent towards SS with 4 rather thick hairs in the middle (two on both sides).

Type material: **South Africa:** 1 male, HT, Port St. John, Pondoland, 16-28.iv.1924., S.Africa, R.E. Turner, Brit. Mus., 1924-235. (BMNH). **Democratic Republic of Congo:** 1 male [HT of *E. apiculatus*, no head], Congo Belge, P.N.G., Miss[ion] H. De Saeger, Pidigala, 23-iv-1952, H. De Saeger 3358., coll. Mus. Congo (ex. coll. I.P.N.C.B.); 1 male [HT of *E. dorsalis*], Congo belge: Kiwu Rutshuru (riv. Musugereza), 1100 m, 8-vii-1935, G.F. de Witte: 1628; 1 female [AT of *E. dorsalis*], ibid., 10-vii-1935, No. 1634; 1 female [PT of *E. dorsalis*], ibid. as AT, No. 1633; 1 female [PT of *E. dorsalis*], Congo belge: P.N.A., Escarpem[ent (=slope)] de Kabasha, 1500 m, 14-xii-1934, G.F. de Witte: 919 (all MRAC); 1 male [PT of *E. dorsalis*], Congo belge: P.N.A., Kanyabayongo (Kabasha), 1760m, 11-xii-1934, G.F. de Witte: 904 (USNM).

Other material examined: **Tanzania:** 1 male, East Usambara, Amani, 1000 m, 06.02.1977, H. Enghoff, O. Lomholdt, O. Martin leg.; 1 male, same data, 7.02.; 1 male, same data, 21.01. (all ZMUC); **Uganda:** 1 male, Ankole Dist., Kalinzu Forest, 6-16.02.1973, H Gønget leg (ZMUC); 1 male, Budongo Forest, 7–8.ii.1935., F.W. Edwards, B.M. 1935–203 (BMNH); **Kenya:** 1 male, Nairobi, 1600-1650 m, VII/85, NLH Krauss (AMNH); 1 male, lake Nakuru, 5767 feet, 15-16.xii.1970, A.E Stubbs, B.M. 1972-211; 1 male, 14–16 km S of Nakuru, 15.vii.1970, A.E Stubbs, B.M. 1972-211 (both BMNH).

Male
Head. Third antennal segment acuminate; brown. Face greyish pollinose. Frons, upper part shining black, lower part greyish pollinose, shining black patch in the middle; eyes touching for distance equal to 4 times ocellar triangle. Occiput, upper half brownish, lower half greyish pollinose.
Thorax. Humeri pale brown. Mesonotum (viewed obliquely from front) with brownish pollinosity, with two silvery triangles along anterior margin; mostly black from the side with faint greyish-brown pollinosity. Scutellum brownish pollinose, 7-12 pairs of distinct pale hairs. Dorsocentral hairs weakly developed. Halter: base of stem and knob brown, stem otherwise pale brown.
Legs. Trochanters and femora brown-black with greyish pollinosity except for ventrobasal surface of f3, knees yellow, tibiae yellow-brown on basal 1/3, otherwise dark brown. Tarsal segments brown to dark brown (yellow-brown in original description of E. *apiculatus*), last segment black. Ventroapical row of 3-6 short black spines on first four femora; 2-4 short black spines on 3rd femur. Subapical (distal) spines on first four tibiae present. One dark spine anteromedially on 3rd tibia (sometimes only short hairs present), and usually first four tibiae with a similar spine as well. Hind trochanter covered with minute white hairs on ventral side. Pulvilli equal to distinctly shorter than last tarsal segment.
Wing. Fourth costal section 0.5 times as long as third costal section. Cross-vein R-M at 1/3 of discal cell. Pterostigma fully coloured. Four weak hairs on tegula.
Abdomen. Viewed obliquely from front tergites subshining black, hind margins: distal half of T2-4 and 2/3 of T5 and sides of tergites brownish pollinose. Hairs dispersed, short and weakly developed. Three dark lateral spines on first tergite. Postabdomen in dorsal view: T5 equally long as ST8. Genitalia without dissection: edge of S7 visible, T5 slightly longer than ST8, which is subshining black, m.a. elongated ellipse (either retracted, then as a depression, or blown up, then as a keel), SS pale or yellowish-brown.

Genitalia
Surstyli subsymmetrical with an appendage each on the side. SES not clear, 10-12 small spines at the base of both SS; gonopods subsymmetrical; hypandrium not connected to EP; phallic guide pointed, laterally bent towards SS with 4 rather thick hairs in the middle (two on both sides); phallus trifid (short on the drawing, but usually reaches well over SS), laterally one of the tubes is slightly longer (probably only on the specimen drawn); ejaculatory apodeme funnel-shaped; sperm pump roundish, also funnel-like.
Female (based on *E. dorsalis*, AT)
As male except for the following characters. Third antennal segment long acuminate. Frons, eyes separated; silver-grey pollinose on lower 1/8, another 1/8 only greyish on sides and all the rest is shining black. Pulvilli and claws on first leg about 2 times as long as last tarsal segment. Third tibia with an erect black spine. Pterostigma fully coloured, but pale. T2 completely greyish, sides of abdomen with grey patches. Female ovipositor on Fig. 55V–W.
Distribution – Madagascar, South Africa, Democratic Republic of Congo, Tanzania, Uganda, Kenya.

Dasydorylas minymerus (Hardy, 1962)

(Figs 23G–L)

Pipunculus (Eudorylas) minymerus Hardy 1962: 264.

Diagnosis: Eyes touching for distance equal to 5-6 times ocellar triangle. Fourth costal section very short (0.5 times the length of C3). T5 3 times as long as ST8. Surstyli symmetric, slightly curved at tip; with numerous hairs at base of SS; phallic guide pointed and with lobes in ventral view (curved towards SS in lateral view); tubes of the phallus are very thin.

Type material: **Madagascar:** 1 male, HT, costal forest, Fenerive, [East] Madagascar, Dec. 1955, B. Stuckenberg (MNHN), 1 male, PT, [West] Madagascar. Tul., Sakaraha, 13.III.58, F. Keiser (NHMB).

Male
Head. Third antennal segment acuminate; brown. Face silvery pollinose. Frons, upper part shining black, lower part black (and velvet-like) along edges, dull black in the middle; eyes touching for distance equal to 5-6 times ocellar triangle. Occiput silvery pollinose.
Thorax. Humeri black. Mesonotum (viewed obliquely from front) black pollinose, along anterior margin somewhat more shining; brownish pollinose from the side. Scutellum brownish pollinose, with 5-7 longer hairs (as long as width of f1 at base). Dorsocentral hairs weakly developed. Halter brown.
Legs. Trochanters, femora and tibiae brown (f1 and f2 shining posteroventrally), knees and tip of tibiae yellow-brown, hind tibia slightly thickened in the middle. Tarsal segments yellow-brown, last segment brown. Ventroapical row of 6-8 very short spines on first four femora; 10-12 hairs on 3rd femur. Subapical (distal) spines on first four tibiae absent. Two-three erect anteromedial hairs on 3rd tibia. Hind trochanter with 5-6 pale hairs on ventral side. Pulvilli shorter than last tarsal segment.
Wing. Fourth costal section 0.5 times as long as third costal section. Cross-vein R-M at 1/3 of discal cell. Pterostigma fully coloured. One hair present on the tegula.
Abdomen. Viewed obliquely from front T2-5 subshining black, hind margins of T2-5 (and T1 completely) brownish pollinose, sides brown on hind margins. Hairs of the abdomen missing, laterally 6-7 dark bristles in a row on first tergite. Postabdomen in dorsal view: T5 3 times as long as ST8. Genitalia without dissection: ST8 very small, m.a. present (half the width of ST8), SS symmetric.
Genitalia
Surstyli symmetric, slightly curved at tip; ST8 with m.a. visible. Borders of SES *uncertain*, with numerous hairs at base of SS; gonopods small, symmetric; hypandrium narrow, elongated; phallic guide pointed and with lobes in ventral view (curved towards SS in lateral view); phallus trifid, tubes very thin; ejaculatory apodeme elongated funnel shaped; sperm pump vase shaped.
Female – Unknown.
Remarks – This species clearly belongs to *Dasydorylas* based on the shape of SS, the presence of hairs at base of SS and the erect anteromedial hairs on t3.
Distribution – Madagascar.

Dasydorylas okongoensis sp. n.

(Figs 24A–F, 54S)

Diagnosis: This species is generally dark in colour (still pale humeri), two very distinct erect hairs on t3 anteromedially and 3-4 dark spines in a row on the hind trochanters ventrally.

Type material: **Namibia:** 1 male, HT [# T648], Eenhana district, 29 E Okongo, 17°37'22''S 17°28'44''S, 14-15.x.1999, Kirk-Spriggs Pape Hauwanga, Malaise traps, dry woodland; 1 female, AT, same data as HT (both NMNW); 6 males, 3 females, PTs, same data as HT (NMNW, except 2 males, 1 female HNHM).

Other material examined: **Namibia:** 1 male, 3 females, Rundu district, 20 km E Rundu, 17°55'46''S 19°58'43''E, 17-18.x.1999, Kirk-Spriggs Pape Hauwanga, Malaise trap sample (NMNW, 1 female HNHM). **Botswana:** 1 male, Third Bridge, 19°14'S 23°21'E, 10.III.1993, E. Marais (NMNW).

Male

Head. Third antennal segment acuminate; yellow-brown. Face silvery pollinose. Frons, upper part subshining black, lower part grey; eyes touching for distance equal to 2 times ocellar triangle. Occiput silvery pollinose, more brownish towards ocelli.

Thorax. Humeri pale brown. Mesonotum (viewed obliquely from front) subshining grey, along anterior margin more silvery; greyish from the side. Scutellum slightly silvery pollinose, with very few, weak hairs. Dorsocentral hairs short. Halter yellowish brown, stem darker.

Legs. Trochanters and base of femora dark brown, femora black (f1-2 silvery pollinose posteriorly and shining black ventrally; f3 shining black pv), knees yellow, tibiae and tarsal segments brownish yellow, last segment dark brown. Ventroapical row of 6-7 short, dark spines on first four femora; 7-8 longer spines on 3rd femur. Subapical (distal) spines on first four tibiae present. Two erect, dark anteromedial hairs on 3rd tibia. Hind trochanter with 3-4 dark spines in a row on ventral side. Pulvilli shorter than last tarsal segment.

Wing. Fourth costal section 0.7-0.8 times as long as third costal section. Cross-vein R-M just before 1/3 of discal cell. Pterostigma fully coloured. Hairs on tegula missing.

Abdomen. Viewed obliquely from front tergites subshining black, distal 1/3 of T1-4 silvery pollinose laterally, T5 grey on distal half, sides of tergites grey on distal half. Hairs dispersed, short and weakly developed. Laterally 3-4 dark spines in a row on first tergite. Postabdomen in dorsal view: T5 1.4-1.5 times as long as ST8. Genitalia without dissection: ST8 black, rectangular in dorsal view, SS and cerci yellow, m.a. as broad as 2/3 of width of ST8.

Genitalia

Surstyli symmetrical, both with median projections; epandrium with distinct shape around cerci. SES *uncertain*; gonopods subsymmetrical, both pointed at tip and with tiny hairs; hypandrium with "tubercles" on lobes; phallic guide broad in ventral view, pointed and with projection in lateral view; phallus trifid, minute spines on at least one branch and with extra structure visible in ventral view; ejaculatory apodeme rounded, club-like; sperm pump oval.

Female

As male except for the following characters. Frons, eyes separated; silver-grey pollinose except in front of ocellar triangle on upper 2/3 of frons. Pulvilli and claws about as long as last tarsal segment. Female ovipositor on Fig. 54S.

Distribution – Namibia, Botswana.

Etymology – The species' name comes from the type locality Okongo in Namibia.

Dasydorylas quasidorsalis (Hardy, 1961)

(Figs 24G–L, 54J–K)

Dorilas (Eudorylas) quasidorsalis Hardy 1961: 145.

Diagnosis: Fourth costal section very short (0.5 times the length of C3). Femora and tibiae dark brown to black. SES with 12-14 little spines; gonopods symmetric, with 1-2 minute hairs on each side; phallic guide pointed, with 2 spines; phallus longer than SS, curved.

Type material: **Democratic Republic of Congo:** 1 male, HT, Congo belge, P.N.G., Miss[ion] H. De Saeger, II/fd/18, 21-xii-1951, Rec. H. De Saeger 2939; 1 female, AT, same as HT, II/gd/4, 22-viii-1952, No. 3964; 1 female, PT, same as HT, II/fd/17, 28-i-1952, No. 3067; 1 female, PT, same as HT, II/gd/10, 8-viii-1952, No. 3909 (all MRAC); 1 female, PT, same as HT, II/gc/8, 30-iv-1952, No. 3402, I.G. 24.203 (ISNB).

Male

Head. Third antennal segment acuminate; brown. Face greyish pollinose. Frons, upper part black, lower part with black triangle in the middle, otherwise greyish pollinose; eyes touching for distance equal to 3.5-4 times ocellar triangle. Occiput, upper half brownish, lower half greyish pollinose.

Thorax. Humeri pale brown. Mesonotum (viewed obliquely from front) brownish pollinose, along anterior margin with 2 greyish patches; brown from the side with grey pollinosity. Scutellum with faint brownish pollinosity, two bristle-like hairs. Dorsocentral hairs *uncertain*. Halter: knob and basal half of the stem black, yellow distally.

Legs. Trochanters and base of femora dark brown, femora black (f3 shining posteroventrally), knees yellowish brown, tibiae black (yellow at tip). Tarsal segments yellow-brown, last segment darker. Ventroapical row of 6-7 strong, short spines on first four femora (first four legs missing on HT); 4-5 weak hairs on 3rd femur. Subapical (distal) spines on first four tibiae present. One bristle-like anteromedial hair on 3rd tibia. Hind trochanter greyish pollinose with 3-4 fine pale hairs on ventral side. Pulvilli slightly longer than last tarsal segment.

Wing. Fourth costal section 0.5 times as long as third costal section. Cross-vein R-M beyond 1/3 of discal cell. Pterostigma almost fully coloured. 2-3 hairs on tegula.

Abdomen (most parts dissected). Lateral spines on first tergite: 1 dark brown bristle.

Genitalia

Surstyli subsymmetrical; ST8 slightly enlarged, m.a. wide, slit-like. SES borders not clear, with 12-14 little spines; gonopods symmetric, with 1-2 minute hairs on each side; phallic guide pointed, with 2 spines; phallus longer than SS, curved; ejaculatory apodeme and sperm pump both funnel-shaped.

Female

As male except for the following characters. Frons, eyes separated; shining black, except basal part (close to antennae), which is greyish pollinose (for length of ocellar triangle). Trochanter more shiny, but also with white hairs. Fourth costal section on wing equal to third. Halter yellow-brown, base darker. Abdominal T1,2 greyish pollinose, other tergites black with brownish pollinosity; hind margins of T3-5 brownish pollinose; sides with grey patches. T1 with 4-5 black bristles. Female ovipositor on Fig. 54J–K.

Distribution – Democratic Republic of Congo.

Dasydorylas sordidatus (Hardy, 1950)

(Figs 25A–F, 55M)

Dorilas (Eudorylas) sordidatus Hardy 1950: 36.

Diagnosis: 3-4 outstanding dark hairs anteromedially on 3rd tibia. Surstyli bent ventrally and with numerous hairs on the ventral side at border with SES; phallic guide short, rather wide apically and with folded membranes, tip pointed in lateral view.

Type material: **Democratic Republic of Congo:** 1 male, HT, Congo belge: Kiwu, Kinyamuhara (Djomba), 1800 m, 23-viii-1934, G.F. de Witte: 55; 1 female, AT, Congo belge: PNA, vers Mt. Kamatembe, vers 2300 m, 7 au 23-i-1935, G.F. de Witte: 1051 (both MRAC); 1 male, PT, Congo belge: P.N.A., Nyasheke (Volc. Nyamuragira), 1820m, 14 au 26-vi-1935, G.F. de Witte: 1482 (USNM).

Other material examined: **Kenya:** 1 male, lake Nakuru, 5767 feet, 15-16.xii.1970, A.E Stubbs, B.M. 1972-211 (BMNH).

Male (No head on specimens)
Head.
Thorax. Humeri dark brown. Mesonotum (viewed obliquely from front) brown pollinose; subshining brown from the side. Scutellum brownish pollinose, 8-10 pairs of black bristles as long as width of t3 at widest. Dorsocentral hairs well developed. Halter brown.
Legs. Trochanters and femora dark brown to black, knees yellowish, basal 1/3 of tibiae yellow-brown, otherwise black. Tarsal segments brown, last segment black. Ventroapical row of 4-5 short, black spines on f1, 7-8 on f2; 5-6 longer one on 3rd femur. Subapical (distal) spines on first four tibiae present. 3-4 outstanding dark hairs anteromedially on 3rd tibia. Hind trochanter bare on ventral side. Pulvilli slightly longer than last tarsal segment.
Wing. Fourth costal section 0.75 times as long as third costal section. Cross-vein R-M at 2/5 of discal cell. Pterostigma fully coloured. Hairs on tegula absent.
Abdomen. Viewed obliquely from front tergites brownish pollinose (HT shrunken). Hairs dispersed, short and darker on sides. 5-6 dark lateral spines on first tergite. Postabdomen in dorsal view: T5 1.2 times as long as ST8. Genitalia without dissection: black, m.a. occupies half width of ST8, SS and EP yellow-brown.
Genitalia
Surstyli symmetrical, bent ventrally and with numerous hairs on the ventral side at border with SES. SES short, borders *uncertain*; gonopods asymmetrical, outer longer; hypandrium elongated; phallic guide short, rather wide apically and with folded membranes, tip pointed in lateral view; phallus trifid, branches slender; ejaculatory apodeme slightly funnel shaped; sperm pump rounded.
Female (no head on AT)
As male except for the following characters. Only short, pale hairs on scutellum. Pulvilli and claws not enlarged, about as long as in males. Two hairs on tegula. Abdomen: T1,2 silvery pollinose, otherwise brownish, with grey triangle-like patches on the side. Female ovipositor (Fig. 55M) with long and slender piercer.
Distribution – Burundi, Democratic Republic of Congo, Kenya.

Dasydorylas turneri (Hardy, 1949)

(Figs 25G–L)

Dorilas (Eudorylas) turneri Hardy 1949*a*: 58.

Diagnosis: No anteromedial hairs on 3rd tibia. T5 three times as long as ST8, S7 enlarged. Surstyli large, both hook-shaped in lateral view and with extended basal lobes; SES clearly visible, with 16-18 hairs on both sides; phallic guide narrowing towards tip, S-shaped in lateral view; phallus: only one branch visible.

Type material: **South Africa:** 1 male, HT, Cape Town, Milnerton, Jan. 1926; S. Africa, R.E. Turner, Brit. Mus. 1926-71 (BMNH).

Male
Head. Third antennal segment obtuse; brown. Face silvery pollinose. Frons, upper part shining black, lower part silvery pollinose except a black median line as wide as 1/3 of frons; eyes touching for distance equal to 3.5-4 times ocellar triangle. Occiput, lower half silvery pollinose, upper half less so.

Thorax. Humeri pale brown. Mesonotum (viewed obliquely from front) brownish pollinose, along anterior margin more silvery; also grey from the side. Scutellum brownish pollinose, with 6-8 pairs of short, pale hairs. Dorsocentral hairs weakly developed. Halter brown.
Legs. Trochanters and base of femora yellow, femora black with silver pollinosity (f3 shining posteroventrally), knees, tibiae, tarsal segments yellow, last segment brown. Ventroapical row of 10-12 short, black spines on mid femora; no spines on 3rd femur. Subapical (distal) spines on first four tibiae present, but weakly developed. No anteromedial hairs on 3rd tibia. Hind trochanter covered with short, white pubescence on ventral side. Pulvilli as long as last tarsal segment.
Wing. Fourth costal section as long as third costal section. Cross-vein R-M beyond 1/3 of discal cell. Pterostigma fully coloured. Hairs on tegula absent.
Abdomen. Viewed obliquely from front tergites subshining black with slight brownish pollinosity on T1,2, sides with silver pollinosity. Minute whitish hairs dispersed. Four dark lateral spines on first tergite. Postabdomen in dorsal view: S7 clearly visible; T5 three times as long as ST8. Genitalia without dissection: black, ST8 small, S7 enlarged, EP and SS yellowish.
Genitalia
Surstyli large, subsymmetrical, both hook-shaped in lateral view and with extended basal lobes; epandrium as long as broad; ST8 in dorsal view not extending too much to the right, m.a. small, round. SES clearly visible, with 16-18 hairs on both sides; gonopods weakly developed, symmetric; hypandrial lobes elongated; phallic guide narrowing towards tip, S-shaped in lateral view; phallus: no division, only one branch visible; ejaculatory apodeme linear, broadening at tip; sperm pump oval with two small projections.
Female – Unknown.
Distribution – South Africa.

d) *Revision of the genus* **Eudorylas** *Aczél, 1940*

Eudorylas Aczél, 1940: 151. Type species: *Pipunculus fuscipes* Zetterstedt, 1844, by subsequent designation (ruling of the ICZN 2002: 143, Opinion 2000, Case 3132).
Metadorylas Rafael, 1987: 35. Types species: *Pipunculus schreiteri* Shannon, 1927, by original designation, syn.: Skevington & Yeates (2001): 438.

Diagnosis – Pedicel usually with very short bristles, pterostigma present, tegula with 0-2 hairs. Distal tibial spines on first four tibiae usually present, front femur usually with rows of ventral spines. ST8 usually with membranous area, surstyli and gonopods asymmetrical, phallus trifid, ejaculatory apodeme fan shaped, sperm pump elongate with two distal tails. For more details see Skevington & Yeates (2001).

Eudorylas abdominalis (Loew, 1858)

(Fig. 54M)

Pipunculus abdominalis Loew 1858: 374 [1860: 354].

Diagnosis: All tergites in lateral view and T5 entirely are yellow. But only the female HT is known so far therefore identifications must be done with caution.

Type material: **South Africa:** 1 female, HT, Caffraria [2 hand-written labels:] "235.", "167", [typewritten label:] "Pipunculus abdominalis" (NHRS).

Female
Head. Third antennal segment acuminate; yellow. Face silvery pollinose. Frons, upper part shining black, V-shaped turns (in the middle of the frons) continuously into the silvery pollinose (lower) part. Occiput, lower half silvery pollinose, upper half brownish.

Thorax. Humeri yellow. Mesonotum (viewed obliquely from front) silvery pollinose; also grey from the side. Scutellum grey, with 3-4 pairs of pale hairs. Dorsocentral hairs very weakly developed. Halter yellow.
Legs. Completely yellow. Ventroapical row of 4-5 very short, dark spines on f2; no spines on f1,3. Subapical (distal) spines on first four tibiae well developed. One or two erect, pale anteromedial hairs on 3rd tibia. Hind trochanter covered with minute brown hairs on ventral side. Pulvilli slightly longer than last tarsal segment.
Wing. Fourth costal section as long as third costal section. Cross-vein R-M at 2/5 of discal cell. Pterostigma fully coloured. Hairs on tegula missing.
Abdomen. Viewed obliquely from front tergites (shining): T1 yellow-brown completely, T2-4 brown in the middle (ca. 1/3), yellow on both sides dorsally, T5 almost entirely brown. In lateral view all tergites are yellow. Hairs dispersed, pale and weakly developed. Laterally 2 dark spines on first tergite.
Ovipositor (Fig. 54M): base dark brown, piercer yellow-brown, about as long as base.
Male – Unknown.
Remarks – The type specimen was collected during a Swedish expedition to southern and south-eastern Africa led by J.A. Wahlberg. The numbers refer to particular localities, but the list of localities had disappeared and correct labels had never been produced according to Thomas Pape, NHRS (pers. comm.). The specimen is from "Caffraria", which refers to a large part of current South Africa. Loew 1858 (p. 374) gives the type locality as "Caffraria (Wahlb.)", but does not mention the number of specimens he had studied.
Distribution – South Africa, Burundi, Madagascar, Rwanda, Tanzania, Uganda, Democratic Republic of Congo, Zimbabwe.

Eudorylas acroapex (Hardy, 1962)

(Figs 26A–F)

Pipunculus (Eudorylas) acroapex Hardy 1962: 252.

Diagnosis: 2-3 erect anteromedial hairs on 3rd tibia. The m.a. round, pv directed, occupies 2/3 of width of ST8. Surstyli symmetric, rounded at tip; ST8 with large m.a.; gonopods symmetric, tips with 3 hairs on each side; phallic guide pointed at tip (hooked in lateral view), with 2 projections in ventral view; phallus short, trifid, two branches teethed.

Type material: **Madagascar:** 1 male, HT, [West] Madagascar Tul., Sakaraha, 13.III.58, F. Keiser (BMNH).

Other material examined: **Mozambique:** 1 male, Mlanje, 17.iii.1913., [leg.] S.A. Neave, No 1953–357, No 1953–343 [Hardy's label: "Dorilas n. sp. rel. to abditus Hardy, poor cond., Det. 1977 D.E. Hardy"] (BMNH).

Male
Head. Third antennal segment acuminate; brown. Face silvery pollinose. Frons, upper part shining black, lower part silvery pollinose; eyes touching for distance equal to 3 times ocellar triangle. Occiput, lower half silvery pollinose, upper half less so.
Thorax. Humeri yellow. Mesonotum (viewed obliquely from front) brownish pollinose; silvery from the side. Scutellum slightly silvery, with 6-7 pairs of weakly developed hairs. Dorsocentral hairs weakly developed. Halter brown, middle of stem yellow.
Legs. Trochanters and base of femora yellow-brown, femora brown, shining ventrally, f3 posteriorly as well. Knees, tibiae and tarsal segments yellow, last segment brown. Ventroapical row of 7-8 black, short spines on first four femora; 5-6 spines on 3rd femur (same size). Subapical (distal) spines on first four tibiae missing. 2-3 erect anteromedial hairs on 3rd tibia. Hind trochanter with 2 brown hairs on ventral side (as long as width of f3 at base). Pulvilli distinctly shorter than last tarsal segment.
Wing. Cross-vein R-M at 1/3 of discal cell. Pterostigma fully coloured. Hairs on tegula missing.

Abdomen. Viewed obliquely from front tergites brownish pollinose (T1 silvery), hind margins with small grey triangles laterally (almost reaching each other on T5), sides completely greyish pollinose. No abdominal hairs. Lateral spines on first tergite dark brown, in a row of 4-5. Postabdomen in dorsal view: T5 1.2 times as long as ST8. Genitalia without dissection: ST8 subshining brown, cerci yellowish, m.a. round, pv directed, occupies 2/3 of width of ST8.
Genitalia
Surstyli symmetric, rounded at tip; epandrium small; ST8 with large m.a. Borders of SES *uncertain*; gonopods symmetric, tips with 3 hairs on each side (the shape of the tip may vary); phallic guide pointed at tip (the hook in lateral view is characteristic), with 2 lateral projections in ventral view; phallus short, trifid, two branches with teeth; ejaculatory apodeme linear; sperm pump short, round.
Female – Unknown.
Distribution – Madagascar, Mozambique.

Eudorylas aculeatus (Loew, 1858)

(Figs 26G–L)

Pipunculus aculeatus Loew 1858: 375 [1860: 355].

Diagnosis: Scutellum brown, with 4-6 longer dark hairs. Surstyli subsymmetrical, broad at tip (may be an amorphous knob); epandrium as wide as long; ST8 with small, triangular m.a.; OG longer; SES clearly visible, with 5-7 thick hairs on each side; phallic guide hairy, thick and strongly bent in ventral view, slightly curved towards SS in lateral view, tip pointed; phallus trifid, branches short, compared to phallic guide.

Type material: **South Africa:** 1 male, HT, Caffraria, [2 hand-written labels:] "236" and "170", [typewritten label:] "Pipunculus claripennis" [leg: Wahlberg] (NHRS), see remarks.

Other material examined: **South Africa:** 1 male, RSA, Cape Prov[ince], Piekeniers-kloof, 15 km S Citrusdal, 32°38' S, 18°57' E, 370m, 04.X.1994., loc.5., leg. R. Danielsson (ZML).

Male
Head. Third antennal segment acuminate; dark brown, arista shining black. Face silvery pollinose. Frons, upper part shining black, lower part silvery pollinose with black median line; eyes touching for distance equal to 3.5 times ocellar triangle. Occiput, lower half silvery pollinose, upper half brownish.
Thorax. Humeri yellow. Mesonotum (viewed obliquely from front) brownish pollinose; silvery from the side. Scutellum brown, with 4-6 longer dark hairs. Dorsocentral hairs weakly developed, but dark hairs are present on humeri and on notopleura (12-14). Halter brown, stem yellow apically.
Legs. Trochanters and base of femora yellow, femora black with greyish pollinosity (f3 shining posteroventrally); knees, tibiae and tarsal segments yellow, last segment brown. Ventroapical row of 8-10 strong black spines on mid femora; 3-4 short hairs on 3rd femur. Subapical (distal) spines on first four tibiae strongly developed. No anteromedial hairs on 3rd tibia. Hind trochanter with 10-12 erect hairs on ventral side (as long as width of t3 at base). Pulvilli as long as last tarsal segment.
Wing. Fourth costal section 0.9 times as long as third costal section. Cross-vein R-M beyond 2/5 of discal cell. Pterostigma fully coloured. Hairs on tegula missing.
Abdomen (already dissected). Laterally 2-4 strong dark spines on first tergite.
Genitalia
Surstyli subsymmetrical, broad at tip (can be distinct); epandrium as wide as long; ST8 with small, triangular m.a. Borders of SES clearly visible, with 5-7 thick hairs on each side; gonopods asymmetrical, OG longer; phallic guide hairy, thick and strongly bent in ventral view, slightly curved towards SS in lateral view, tip pointed; phallus trifid, branches short, compared to phallic guide; ejaculatory apodeme linear, broad at tip; sperm pump elongated.
Female – Unknown.
Remarks – The type for this species has been mislabelled, probably by the author after having made the descriptions for *Pipunculus aculeatus* and *P. claripennis* in Loew (1858). There is a list created by

Loew himself for his identifications (courtesy of Bert Viklund, Stockholm), were he gives the numbers present on the labels of specimens and the identification belonging to the specific individual. This is 169 and 238 for *P. aculeatus*, but the specimen with these data is a female *Tomosvaryella*. Loew (1860) gives more detailed descriptions in German, and from those features (e.g. presence of the pterostigma, position of the R-M vein and the sex (male for *P. aculeatus*)) it is clear that the types of the two species were mixed. The type specimens have been labelled according to these facts, but original labels haven't been removed.
The type specimen was collected during a Swedish expedition to southern and south-eastern Africa led by J.A. Wahlberg. The specimen is from "Caffraria", which refers to a large part of current South Africa. Loew 1858 (p. 375) gives the type locality as "Caffraria (Wahlb.)", but does not mention the number of specimens he had studied.
Distribution – South Africa.

Eudorylas aemulus (Hardy, 1949)

(Figs 27A–C, 54C)

Dorilas (Eudorylas) aemulus Hardy 1949*a*: 16.

Diagnosis: Third antennal segment long acuminate. Surstyli curving towards each other, both with ventral projections at base; SES with several hairs (6-7); gonopods strongly sclerotized behind PG; phallic guide with two lobes at the end and with an uncertain structure in the middle.

Type material: **South Africa:** 1 female, HT, Mossel Bay, Cape Province, 1-14. XI. 1921., S. Africa, R.E. Turner, Brit. Mus. 1921-476.; 1 male, AT, Natal: Van Reenen, Drakensberg 1-22.i.1927, S. Africa R.E. Turner, B.M. 1927-54. (both BMNH); 1 female, PT, Cape Town, Milnerton, Jan 1926, ... 1926-71., Paratype No 58386 (USNM).

Male (AT - legs partly remained)
Head. Third antennal segment long acuminate; dark brown. Face and frons silvery pollinose. Eyes touching for distance equal to 2 times ocellar triangle. Occiput silvery pollinose.
Thorax. Humeri pale. Mesonotum (viewed obliquely from front) brownish pollinose, silvery along anterior margin; brown from the side. Scutellum brownish pollinose with weakly developed hairs. Dorsocentral hairs weakly developed. Halter dark brown, stem yellowish.
Legs. Trochanters and femora black, knees yellowish brown, proximal 2/3 of tibiae dark brown, distally yellowish. Tarsal segments yellow-brown, last segment *missing*. No ventroapical row of spines on femora. Subapical (distal) spines on first four tibiae very weak. Hind trochanter without hairs or spines on ventral side.
Wing. Fourth costal section approximately equals the third costal section. Cross-vein R-M just beyond 2/5 of discal cell. Pterostigma partly coloured (only distal 2/3). Hairs on tegula *uncertain*.
Abdomen. Greasy, colours not clear. Hairs short and weakly developed. Lateral spines on first tergite missing. Postabdomen in dorsal view: T5 1.6 times as long as ST8. Genitalia without dissection: small, dark; SS yellowish, no membranous area.
Genitalia
Surstyli curving towards each other, both with ventral projections at base; cerci elongated; ST8 large, triangle-shaped. Borders of SES *uncertain* with several hairs (6-7); gonopods subsymmetrical, strongly sclerotized behind PG; hypandrium elongated, slightly turned, not connected to EP; phallic guide with two lobes at the end and with an uncertain structure in the middle; phallus: *missing* on AT.
Female (HT and PT damaged)
As male except for the following characters. Frons, eyes separated; shining black on at least 2/3 of the upper part, otherwise probably silvery pollinose. Face silver-grey. Pv surface of f1,2 greyish pollinose, f3 shining black. Ventroapical row of 6-7 small black spines on first four femora, 5 longer, black spines on f3. One erect anteromedial hair present on t3. Pulvilli and claws about 2 times as long as last tarsal segment. Trochanters with 4-5 fine, pale hairs ventrally (1-3 longer brown hairs may be present, as long as width of t3 at base), apical half of t3 thicker. Fourth costal section 0.8 times as long as third

costal section, cross-vein R-M beyond 1/3 of discal cell. Abdomen with brownish pollinosity and grey patches on sides. Female ovipositor (Fig. 54C) flattened and with sclerotized ridge laterally.
Remarks – Genitalia of the male AT were lost after three drawings. The other two male PTs have been described as *E. swanengi* and *E. pondolandi* in Földvári (2003), since the shape of the genitalia were strongly different.
Distribution – South Africa, Nigeria.

Eudorylas aethiopicus (Hardy, 1949)

(Figs 27D–I, 55A–B)

Dorilas (Eudorylas) aethiopicus Hardy 1949*a*: 17.

Diagnosis: Third antennal segment long acuminate. ST8 very large; thick hairs at base of SS (6 left, 3 right); gonopods' apical part with little "holes", outer edges with zigzag pattern; hypandrium with two long lobes; phallic guide shorter than GP, rounded at tip. In ventral view both SS with an edge along middle line.

Type material: **Kenya:** 1 male, HT, H J A Turner, Naivasha, 7 [July] 37; Pres. By Comm. Inst. Ent. B.M. 1953-343 (BMNH); 1 male, PT, same data as HT (USNM). **South Africa:** 1 female, AT, Cape Province: Sommerset East, October 1930; S.W. Africa, RE. Turner Brit. Mus. 1930-561 (BMNH).

Male
Head. Third antennal segment long acuminate, densely pubescent; brown. Face silvery pollinose. Frons silvery pollinose; eyes touching for distance equal to 3 times ocellar triangle. Occiput silver pollinose, black behind the ocellar triangle.
Thorax. Humeri pale brown. Mesonotum (viewed obliquely from front) brownish pollinose, along anterior margin more silvery; distinctly greyish pollinose from the side. Scutellum greyish-brown pollinose, distinct 4-5 pairs of pale hairs. Dorsocentral hairs very weakly developed. Halter yellow-brown, stem paler.
Legs. Trochanters and base of femora dark brown, femora black with distal 1/5 yellow (f1,2 silvery pollinose, f3 shining black on pv surface), knees yellow, tibiae yellow. Tarsal segments yellow, last segment dark brown. Ventroapical row of 4-8 short, dark spines on first four femora; some very weakly developed hairs on 3rd femur. Subapical (distal) spines on first four tibiae present. No anteromedial hairs on 3rd tibia. Hind trochanter finely pubescent, without hairs or spines on ventral side. Last tarsal segment 1.5 times longer than pulvilli.
Wing. Fourth costal section 1.5 times as long as third costal section. Cross-vein R-M at 2/5 of discal cell. Distal ¾ of pterostigma coloured. No hairs on tegula.
Abdomen. Viewed obliquely from front tergites brownish pollinose, laterally more silvery, hind margins more subshining black, sides greyish pollinose. Hairs dispersed, distinct, pale, longest on ST8. No lateral spines on first tergite. Postabdomen in dorsal view: corners of S7 and EP visible; T5 1.1 times as long as ST8. Genitalia without dissection: postabdomen black with grey pollinosity; EP and SS yellow; SS very asymmetrical, protruding from abdomen; no membranous area.
Genitalia
Surstyli asymmetrical, IS longer; epandrium wide but smaller than ST8; ST8 very large. Borders of SES *uncertain*, some thicker hairs at base of SS (6 left, 3 right); gonopods flattened, apical part with little "holes", outer edges with zigzag pattern; hypandrium with two long lobes, connected to EP; phallic guide shorter than GP, rounded at tip; phallus *uncertain*; ejaculatory apodeme short, thick, widening at tip; sperm pump long, thick tube-like, S-shaped. In ventral view both SS with an edge along middle line.
Female (AT - no head)
As male except for the following characters. Trochanter and base of femur yellowish brown. Pulvilli and claws about 1.5 times as long as last tarsal segment. Subapical (distal) spines distinct on first four tibiae. Cross-vein R-M just beyond 1/3 of discal cell, pterostigma fully coloured. Halter dark brown, stem pale. Abdominal tergites brownish pollinose, 1/3 to 1/5 of hind margins silvery pollinose. Two

dark spines on T1. Female ovipositor (Fig. 55A–B) with two protuberances on the inner surface of the base.
Remarks – The drawing in Hardy 1959*a*: 398 is not *E. aethiopicus*, but resembles more *E. flexus*.
Distribution – Kenya, South Africa.

Eudorylas amanii sp. n.

(Figs 28A–G)

Eudorylas amanii Földvári, in press

Diagnosis: Third antennal segment long acuminate. S7 visible, epandrium broad and curves along outer edge; ST8 small compared to epandrium; SES with several hairs; gonopods very small, not protruding at all; phallic guide with two lobes on each side in ventral view, pointed tip in lateral view.

Type material: **Tanzania:** 1 male, HT, Usambara Mts., Amani, 1000m, 1.1.1976, O. Lomholdt leg (ZMUC); 1 male, PT, East Usambara, Amani, 1000m, 1.ii.1977., Zool. Mus. Copenhagen, H. Enghoff, O. Lomholdt, O. Martin leg. (HNHM)

Male
Head. Third antennal segment long acuminate; yellow-brown. Face silvery pollinose. Frons, upper part shining black, lower part silvery pollinose; eyes touching for distance equal to 3-3.5 times ocellar triangle. Occiput, lower half greyish pollinose, upper half slightly brownish.
Thorax. Humeri pale brown. Mesonotum (viewed obliquely from front) brownish pollinose, somewhat greyish along anterior margin; silvery pollinose from the side. Scutellum grey pollinose, with 4-6 pairs of short, weak hairs. Dorsocentral hairs very weakly developed. Halter yellow-brown.
Legs. Trochanters and base of femora dark brown, femora dark brown with greyish pollinosity (f3 shining posteroventrally), knees yellow, tibiae yellow with faint dark ring in the middle. Tarsal segments yellow, last segment dark brown. Ventroapical row of 6-7 short, black spines on mid femora; no spines on 1st and 3rd femur. Subapical (distal) spines on first four tibiae present. No anteromedial hairs on 3rd tibia. Hind trochanter covered with fine white pubescence on ventral side. Pulvilli slightly shorter than last tarsal segment.
Wing. Fourth costal section 0.8-1 times as long as third costal section. Cross-vein R-M before 1/3 of discal cell. Pterostigma coloured on distal 4/5. Hairs on tegula missing.
Abdomen. Viewed obliquely from front tergites brownish pollinose, T1-4 with silvery patches laterally in dorsal view, T5 completely greyish; sides of all tergites silvery pollinose. Hairs dispersed, short and weakly developed. Laterally short pale hairs on first tergite. Postabdomen in dorsal view: S7 visible; T5 1.3 times as long as ST8. Genitalia without dissection: Generally dark brown to black, no m.a., EP and SS yellow.
Genitalia
Surstyli asymmetrical, IS longer; epandrium broad and curves along outer edge; ST8 small compared to epandrium. Borders of SES *uncertain*, with several hairs; gonopods very small, not protruding at all; phallic guide with two lobes on each side in ventral view, pointed tip in lateral view; phallus not found (may be lost); ejaculatory apodeme linear; sperm pump round with one process.
Female – Unknown.
Distribution – Tanzania.

Eudorylas amitinus (Hardy, 1962)

(Figs 28H–M)

Pipunculus (Eudorylas) amitinus Hardy 1962: 253.
Pipunculus (Eudorylas) fractus Hardy 1962: 260, **proposed new synonymy.**

Diagnosis: Eyes touching for distance equal to 4-5 times ocellar triangle. Three to four anteromedial hairs on 3rd tibia. Surstyli similar in shape but inner tips different; SES clearly visible, with thick hairs medially; phallic guide with parallel sides in ventral view, slightly pointed in lateral view.

Type material: **Madagascar:** 1 male, HT, Madagascar, Centre, Anjavidilava 2020m, Andringitra Ambalavao, 17-21.I.58 B. Stuckenberg (MNHN); 1 male [HT of *E. fractus*], [Central] Madagascar Tan., Ambohitantely, 11.VI.58, F. Keiser (NHBM).

Male

Head. Third antennal segment acuminate; brown or yellow. Face silvery pollinose. Frons, upper part shining black, lower part pollinose along margins, subshining black in the middle; eyes touching for distance equal to 4-5 times ocellar triangle. Occiput, lower half silvery pollinose, upper half more brownish.

Thorax. Humeri brown to dark brown. Mesonotum (viewed obliquely from front) brownish pollinose; more silvery from the side. Scutellum brown, 8-10 short, pale hairs. Dorsocentral hairs well developed, pale. Halter brown to dark brown.

Legs. Entirely yellow brown or brown (f3 shining pv). Ventroapical row of spines on four femora missing. Subapical (distal) spines on first four tibiae missing. Three to four anteromedial hairs on 3rd tibia. Hind trochanter with 5-6 short, pale hairs on ventral side. Pulvilli half as long as last tarsal segment.

Wing. Fourth costal section 0.8-1.1 times as long as third costal section. Cross-vein R-M beyond 2/5 of discal cell. Pterostigma fully coloured. Two dark hairs present on tegula.

Abdomen (already dissected). Viewed obliquely from front tergites brownish pollinose. Hairs dispersed, short and weakly developed. Laterally 3-4 dark spines on first tergite.

Genitalia

Surstyli similar in shape but inner tips different; epandrium short and broad; ST8 broadened, m.a. circular. SES clearly visible, connected to SS, with thick hairs medially; gonopods short, symmetrical; phallic guide with parallel sides in ventral view, slightly pointed in lateral view; phallus trifid, short; ejaculatory apodeme linear; sperm pump elongated, with two small projections, border with sperm duct *uncertain*.

Female – Unknown.

Remarks – Synonymy because of similarity of genitalia: SS with two apical projections and PH, PG identical in shape. Legs are darker on the type of *E. amitinus* and paler on the type of *E. fractus*, but they are neither black (for *E. amitinus*) nor yellow (for *E. fractus*) as in Hardy 1962 (pp. 54,61).

Distribution – Madagascar.

Eudorylas amuscarium (Hardy, 1959)

(Figs 29A–F, 54L)

Dorilas (Eudorylas) amuscarium Hardy 1959*a*: 398.

Diagnosis: One erect anteromedial hair on 3rd tibia. S5 and S4 divided. Surstyli elongated, both C-shaped in lateral view (because of the process at base); cerci asymmetrically placed, small; phallic guide with two lobes and a special unknown structure in the middle of the space between the SS, connected to the base of the lobes on PG.

Type material: **South Africa:** 1 male, HT, S Afr, Cape Prov., Cape Peninsula, Hout Bay Skoorsteenkop, 26.XII.50, No. 95; Swedish South Africa Expedition 1950-1951, Brinck-Rudebeck; Insect trap; 1 female, AT, same data, 2.2.1951., No. 166; 2 males, PTs, same data, 22.I.1951, No. 157. Type No: 2123: 1-4 (all ZML); 1 female, PT, same data as HT (USNM).

Other material examined: **South Africa:** 1 male, Mossel Bay, Cape Province, Aug.1921, S. Africa, R.E. Turner, Brit. Mus. 1921-353 (*D. umbrinus*, det. Hardy 1946) (USNM).

Male

Head. Third antennal segment acuminate; yellow-brown. Face silvery pollinose. Frons, upper part shining black, lower part silvery pollinose, except narrow black line dorsally; eyes touching for distance equal to 3 times ocellar triangle. Occiput silvery pollinose.

Thorax. Humeri pale brown (yellow). Mesonotum (viewed obliquely from front) subshining black, anterior part silvery pollinose; also silvery from the side. Scutellum brownish pollinose, 8-9 pairs of pale hairs. Dorsocentral hairs weakly developed. Halter, knob dark brown, stem pale.
Legs. Trochanters and base of femora yellow, femora dark brown, shining posteriorly, knees, tibiae, tarsal segments yellow, last segment brown. Ventroapical row of 3-4 spines on f1, 10-14 very short, black spines on f2; no spines on 3rd femur. Subapical (distal) spines on first four tibiae present. One erect anteromedial hair on 3rd tibia. Hind trochanter with 2-3 white hairs on ventral side. Pulvilli as long as last tarsal segment.
Wing. Fourth costal section 0.8 times as long as third costal section. Cross-vein R-M at 2/5 of discal cell. Pterostigma fully coloured. Hairs on tegula missing.
Abdomen. Viewed obliquely from front tergites brownish pollinose, hind margins silvery grey, sides completely silvery. Hairs dispersed, very short and weakly developed. Lateral spines on first tergite: 5-6, dark brown. Postabdomen in dorsal view: T6, S7 visible; T5 as long as ST8. Genitalia without dissection: ST8 large, mainly yellow, m.a. small, EP+SS yellow, SS look large in size.
Genitalia
S5 and S4 divided. Surstyli elongated, both C-shaped in lateral view (because of the process at base); epandrium short and wide, cerci asymmetrically placed, small; ST8 with round m.a. SES *uncertain*; gonopods weakly developed (see remarks), IG as a rounded protuberance; phallic guide with two lobes and a special structure in the middle of the space between the SS, connected to the base of the lobes on PG; phallus trifid, short; ejaculatory apodeme broadening at tip, otherwise flat; sperm pump elongated, linear with two membranous lobes.
Female
As male except for the following characters. Frons, eyes separated; completely silver-grey pollinose until 1/6-1/4 from the antennae and along margins up to half of the frons. Enlarged ommatidia silvery shining. Pulvilli and claws about 1.5-2 times as long as last tarsal segment. Female ovipositor (Fig. 54L) straight.
Remarks – Gonopods may be missing, but at least their identity is uncertain, because of the extra structure protruding from the dorsal side of the PG.
Distribution – South Africa.

Eudorylas angolae sp. n.

(Figs 29G–K)

Diagnosis: The thorax and the abdomen of this species are covered with exceptionally dense, pale hairs. The fifth tergite and the last tarsi are dark, but the body is generally yellow (abdomen shining). Surstyli are slightly asymmetrical, bent ventrally; ST8 with large m.a, occupying 2/3 of width of ST8. SES with hairs at base of SS; gonopods symmetrical, shorter than PG; phallic guide straight and blunt in ventral view, bent towards SS and pointed at tip in lateral view; phallus trifid, long and coiled, distal part membranous.

Type material: **Angola:** 1 male, HT, Salazar, I.I.A.A., 9-15.iii.1972, (A26), Southern African Exp., B.M. 1972-I. (BMNH); 1 male, PT, same data as HT (HNHM).

Male
Head. Third antennal segment long acuminate; yellow. Face silvery pollinose. Frons, upper part shining black, lower part silver-grey pollinose; eyes touching for distance equal to 4 times ocellar triangle. Occiput, lower half silvery pollinose, upper half less so.
Thorax. Humeri yellow. Mesonotum (viewed obliquely from front) brownish yellow, along anterior margin somewhat silvery; slightly greyish from the side. Scutellum yellow, with numerous longer pale hairs. Dorsocentral hairs very well developed with several hairs also in the notopleural depression. Halter yellow, knob dark brown.
Legs. Femora, knees and tibiae yellow (t3 brownish). Tarsal segments brownish yellow, last segment dark brown. Ventroapical row of 8-9 short dark spines on mid femora (no spines on f1); No spines on

3rd femur. Subapical (distal) spines on first four tibiae present. No anteromedial hairs on 3rd tibia. Hind trochanter with 4-5 pale hairs on ventral side. Pulvilli as long as last tarsal segment.
Wing. Fourth costal section 1.2 times as long as third costal section. Cross-vein R-M at 1/3 of discal cell. Pterostigma fully coloured. Hairs on tegula missing.
Abdomen. Viewed obliquely from front tergites completely shining yellow-brown, only T5 shining black. Hairs dispersed, long, pale and well developed. Laterally 5-6 long yellow spines on first tergite. Postabdomen in dorsal view: T5 2.5 times as long as T8. Genitalia without dissection: completely yellow, m.a. large, occupying 3/4 of width of ST8.
Genitalia
Surstyli slightly asymmetrical, (OS broader in dorsal view), both bent ventrally; ST8 with large m.a, occupying 2/3 of width of ST8. borders of SES uncertain, with hairs at base of SS; gonopods symmetrical, shorter than PG; phallic guide straight and blunt in ventral view, bent towards SS and pointed at tip in lateral view; phallus trifid, long and coiled, distal part membranous.
Female – Unknown.
Distribution – Angola.
Etymology – Named after the country of origin.

Eudorylas angustus (Hardy, 1952)

(Figs 54T–U)

Dorilas (Eudorylas) angustus Hardy 1952: 8.

Diagnosis: Third antennal segment acute, two times longer than wide; piercer bent at the point where narrowing. Doubtful species, since only one female is known.

Type material: **Burundi:** 1 female, HT, Urundi. Terr. Bururi riv., Sikuvayaye alt. 1800 m., 20-xii-1948, F. François, R.I.Sc.N.B. I.G. 19.700 (ISNB).

Female
Head. Third antennal segment acute, two times longer than wide; yellow. Face silvery pollinose, two times broader than frons. Frons, upper part silvery shining, less so in front of ocellar triangle, lower part completely silvery. Occiput silvery pollinose.
Thorax. Humeri yellow. Mesonotum (viewed obliquely from front) black with brownish pollinosity; brown with silver pollinosity from the side. Scutellum yellow-brown, paler towards tip; inconspicuous, pale hairs on margin. Dorsocentral hairs very weakly developed. Halter yellow-brown, stem long.
Legs. Completely yellow, last tarsal segment somewhat darker. Ventroapical row of 8-12 black spines on first four femora; no 3rd leg on HT. Subapical (distal) spines on first four tibiae distinct, long. Anteromedial hairs on 3rd tibia: 1 strong bristle on outside, based on Hardy's description. Pulvilli two times longer than last tarsal segment, claws 1.3 times longer than pulvilli (on 1st leg).
Wing. Fourth costal section 1.1 times as long as third costal section. Cross-vein R-M beyond 2/5 of discal cell. Pterostigma fully coloured. 2 hairs on tegula.
Abdomen. Viewed obliquely from front tergites silvery pollinose, brownish in the middle on T3-6; sides silvery pollinose. Hairs dispersed, distinct and pale. Two black lateral spines on first tergite. Ovipositor (Figs 54T–U): base visible, piercer bent at the point where narrowing.
Male – Unknown.
Distribution – Burundi.

Eudorylas barracloughi sp. n.

(Figs 30A–F)

Diagnosis: Legs completely black, 1st four femora silvery pollinose, hind femur shining posteriorly. Surstyli asymmetrical, OS larger, both broader distally in lateral view; gonopods hairy; phallic guide broad, sides parallel, with three pointed tips in ventral view, slightly bent in lateral view; phallus trifid,

at least one branch covered with minute hairs; ejaculatory apodeme linear, broader towards tip; sperm pump round.

Type material: **South Africa:** 1 male, HT, Natal, Kosi Bay Nat Reserve, 2632DD, 30.xi-2.xii.82, Londt, Barraclough & Stuckenberg, Forest & open woodland areas (BMNH).

Male
Head. Third antennal segment acuminate; brown. Face silvery pollinose. Frons, upper part subshining black, lower part silvery pollinose; eyes touching for distance equal to 3.5 times ocellar triangle. Occiput, lower half silvery pollinose, upper half subshining black.
Thorax. Humeri yellow-brown. Mesonotum (viewed obliquely from front) subshining black, along anterior margin slightly silvery; completely grey from the side. Scutellum brownish pollinose, without hairs. Dorsocentral hairs weakly developed. Halter yellowish brown.
Legs. Trochanters and femora black (1st four femora silvery pollinose, hind femur shining posteriorly), knees and tibiae yellow. Tarsal segments yellow, last segment brown. Ventroapical row of 6-8 pairs of short black spines on first four femora; 6 pairs of longer spines on 3rd femur. Subapical (distal) spines on first four tibiae missing. No anteromedial hairs on 3rd tibia. Hind trochanter with 2 dark hairs on ventral side, otherwise shining. Pulvilli shorter than last tarsal segment.
Wing. Fourth costal section 0.8 times as long as third costal section. Cross-vein R-M beyond 1/3 of discal cell. Pterostigma fully coloured. Hairs on tegula missing.
Abdomen (already dissected). Viewed obliquely from front tergites silvery pollinose (T1,2). Hairs dispersed, short and weakly developed. Laterally 4-5 dark spines on first tergite.
Genitalia
Surstyli asymmetrical, OS larger, both broader distally in lateral view; ST8 large, m.a. 2/3 as wide as ST8. SES uncertain; gonopods hairy, equally long, OG slimmer; phallic guide broad, sides parallel, with three pointed tips in ventral view, slightly bent in lateral view; phallus trifid, at least one branch covered with minute hairs; ejaculatory apodeme linear, broader towards tip; sperm pump round.
Distribution – South Africa.
Etymology – Named after the collector of the type, David Barraclough (NMSA).

Eudorylas bisetosus (Hardy, 1962)

(Figs 30G–L)

Pipunculus (Eudorylas) bisetosus Hardy 1962: 255.

Diagnosis: Third antennal segment very long acuminate. Two strong bristles on 3rd tibia at the apex anteriorly. T5 4 times as long as ST8 (hidden). Epandrium wide at base, pointed structure around cerci. SES distinct, with minute hairs; gonopods hairy, small, symmetric; phallic guide with numerous hairs in ventral view.

Type material: **Madagascar:** 1 male, HT, [Central] Madagascar, Fia, Ambalamanakana, 18.I.58, F. Keiser (BMNH).

Male
Head. Third antennal segment very long acuminate; yellow. Face silvery pollinose. Frons, upper part shining black, lower part silvery pollinose; eyes touching for distance equal to 2.5 times ocellar triangle. Occiput, lower half silvery pollinose, upper half shining brown.
Thorax. Humeri yellow. Mesonotum (viewed obliquely from front) subshining brown, yellow from the side. Scutellum yellow-brown, with 6-7 pairs of hairs (as long as f3 at widest). Dorsocentral hairs weakly developed. Halter yellow, knob brown.
Legs. Completely yellow. Ventroapical row of 5-7 small, black spines on f2; no hairs or spines on f1,3. Subapical (distal) spines on first four tibiae present. No anteromedial hairs on 3rd tibia, but two strong bristles at the apex anteriorly. Hind trochanter with minute whitish hairs on ventral side. Pulvilli shorter than last tarsal segment.
Wing. Cross-vein R-M at 2/5 of discal cell. Pterostigma fully coloured. Hairs on tegula missing.

Abdomen. Viewed obliquely from front T5 subshining brown. T1-4 brownish yellow, hind margins with yellow markings laterally, sides yellow. Hairs dispersed, darkening towards tip of T5, as long as width of t3 at base. 2-3 yellow, lateral hairs on first tergite. Postabdomen in dorsal view: T5 4 times as long as ST8. Genitalia without dissection: ST8 hidden, dark brown, SS and EP yellow, m.a. small and round.
Genitalia
Surstyli subsymmetrical; epandrium wide at base, pointed structure around cerci. SES distinct, with minute hairs; gonopods small, symmetric, with hairs; phallic guide with numerous hairs in ventral view; phallus trifid; ejaculatory apodeme broadening towards tip; sperm pump linear.
Female – Unknown.
Distribution – Madagascar.

Eudorylas brandbergensis sp. n.

(Figs 31A–F)

Diagnosis: Eyes touching for distance equal to 1.5-2 times ocellar triangle. This species can be recognised by the edge of S7 being visible in dorsal view; the gonopods having minute hairs on median edges and by the phallic guide having two lateral projections in ventral view and the tip of the PG forming a hook in lateral view.

Type material: **Namibia:** 1 male, HT [# T644], Omaruru dist[rict], Ugab R[iver] n[ea]r Brandberg Wes[t], 20°57’39’’S 14°07’55’’E, 21-24.x.1998, Kirk-Spriggs & Marais, Malaise trap sample; 2 males, PTs, same as HT (HT and 1 PT NMNW, 1 PT HNHM); 2 males, PTs, Khorixas district, Huab River, Krone 721, 20°37’09’’S 13°54’31’’E, 23-26.x.1998, Kirk-Spriggs & Marais, Malaise trap (both NMNW).

Male
Head. Third antennal segment short acuminate; brown, distal half yellowish. Face silvery pollinose. Frons, upper part shining black, lower part silvery pollinose; eyes touching for distance equal to 1.5-2 times ocellar triangle. Occiput completely silvery pollinose.
Thorax. Humeri pale brown. Mesonotum (viewed obliquely from front) brownish pollinose, along anterior margin somewhat more silvery; also silvery from the side. Scutellum subshining black, with 5-6 pairs of minute hairs. Dorsocentral hairs present. Halter yellow, base darker.
Legs. Trochanters and femora dark brown (f3 shining pv), knees and basal half of tibiae yellow, tibiae otherwise brow. Tarsal segments yellow-brown, last segment brown. Ventroapical row of 3-6 short, dark spines on first four femora; 4-5 longer spines on 3rd femur (as long as width of t3 at base). Subapical (distal) spines on first four tibiae missing. No anteromedial hairs on 3rd tibia. Hind trochanter without hairs or spines on ventral side. Pulvilli slightly shorter than last tarsal segment.
Wing. Fourth costal section 0.8-0.9 times as long as third costal section. Cross-vein R-M before 1/3, almost at 1/4 of discal cell. Pterostigma coloured on distal 4/5. Hairs on tegula missing.
Abdomen. Viewed obliquely from front tergites slightly pollinose, also on hind margins and on the sides. Hairs dispersed, short, pale and weakly developed. Laterally 2-4 dark spines on first tergite. Postabdomen in dorsal view: edge of S7 visible; T5 1.1-1.2 times as long as ST8. Genitalia without dissection: ST8 rectangular in dorsal view, m.a. triangle shaped, facing pv, EP and SS black.
Genitalia
Surstyli symmetrical, inner edges pointing towards each other; ST8 broad, m.a. as wide as half the width of ST8. Borders of SES *uncertain*; gonopods symmetrical, with minute hairs along median edges; hypandrium with broad lobes; phallic guide broad, with projections on each side in ventral view, hook shaped in lateral view; phallus trifid, with teeth along two branches; ejaculatory apodeme mushroom shaped; sperm pump elongated, flat.
Female – Unknown.
Distribution – Namibia.
Etymology – The name was derived from the type locality, Brandberg.

Eudorylas bredoi (Hardy, 1949)

(Figs 55C–D)

Dorilas (Eudorylas) bredoi Hardy 1949*b*: 1.

Diagnosis: Femora black with silver-grey pollinosity posteriorly; tibiae brown with black ring in the middle; hind tibia broadened in the middle, distal half flattened. Doubtful species, since only one female is known.

Type material: **Democratic Republic of Congo:** 1 female, HT, Congo belge: Elisabethville [today: Lubumbashi], 30-iv-1939, H.J. Brédo, R. Mus. Hist. Nat. Belg. I.G. 12.648 (ISNB)

Female
Head. Third antennal segment acute; brown. Face silvery pollinose. Frons, upper part silvery pollinose, less so on margins; narrowed close to ocellar triangle, lower part silvery pollinose. Occiput with greyish pollinosity.
Thorax (greasy overall). Humeri dark brown/black; except for distal tip, which is light brown. Mesonotum (viewed obliquely from front) black; from the side black with possible dusting. Scutellum black, 6-7 pairs of weakly developed hairs. Dorsocentral hairs very weakly developed. Halter light brown, stem darker.
Legs. Trochanters and base of femora dark brown, femora black with silver-grey pollinosity posteriorly, knees yellow-brown, tibiae brown with black ring in the middle, hind tibia broadened in the middle, distal half flattened. Tarsal segments brown. Ventroapical row of 2-6 short black spines on first four femora; 3-4 short black spines on 3rd femur. No subapical (distal) spine on first four tibiae. No anteromedial hairs on 3rd tibia. Hind trochanter with moderately long hairs on ventral side. Pulvilli equals in length with last tarsal segment, claws 1.5 times longer than pulvilli.
Wing. Fourth costal section 0.8 times as long as third costal section. Cross-vein R-M at 1/3 of discal cell. Pterostigma almost fully coloured. Hairs on tegula *uncertain*.
Abdomen. Viewed obliquely from front tergites black pollinose, hind margins more shining, sides with distinct silver-grey patches. No hairs on abdominal segments. 2-4 black lateral hairs on first tergite with several pale ones. Ovipositor's (Fig 55C–D.) base visible in lateral view.
Male – Unknown.
Distribution – Democratic Republic of Congo.

Eudorylas conformis (Hardy, 1959)

(Figs 31G–K)

Dorilas (Eudorylas) conformis Hardy 1959*b*: 27.

Diagnosis: Eyes touching for distance equal to 4.5-5 times ocellar triangle. Inner surstylus with a projection at base ventrally; SES with 20-22 tiny spines, lower border distinct; phallic guide broadening in the middle, pointed at apex.

Type material: **Rwanda:** 1 male, HT, Congo Belge: Ruanda, Kundhuru ya Tshuve (Col Gahinga-Sabinyo) 2600 m (Bambous), 15-ix-1934, G.F. de Witte: 605 (MRAC). **Democratic Republic of Congo:** 1 male, PT, Congo Belge: P.N.A. Tsamugussa (Bweza) 2250 m (Bambous), 10-viii-1934., G.F. de Witte: 526 [no abdomen, no legs] (MRAC).

Male
Head. Third antennal segment acute; brown [based on PT]. Face greyish pollinose. Frons, lower part greyish pollinose on the sides, black in the middle; eyes touching for distance equal to 4.5-5 times ocellar triangle. Occiput, upper half brownish pollinose, lower half grey.
Thorax. Humeri light brown. Mesonotum (viewed obliquely from front) brownish pollinose; greyish from the side. Scutellum brownish pollinose, with short, pale brown hairs. Dorsocentral hairs weakly developed. Halter, knob dark brown, stem paler.

Legs. Trochanters and base of femora brown, femora black, knees, tibiae, tarsal segments, pale brown [no t3 on types], last segment black. Ventroapical row of 4-5 very small spines on f1; 10-12 short, stout on f2; no spines on 3rd femur. Subapical (distal) spines on first four tibiae missing. Anteromedial hairs on 3rd tibia [no 3. leg on types]. Hind trochanter with minute white hairs on ventral side. Pulvilli slightly smaller than last tarsal segment.
Wing. Long, compared to body, damaged on types. Fourth costal section (probably) equal to third costal section. Cross-vein R-M almost in the middle of discal cell [PT: just beyond 1/3, near basal 2/5 in original description], dm elongated. Pterostigma fully coloured. Hairs on tegula missing.
Abdomen. [dissected in HT] Seven dark, strong bristles laterally on first tergite.
Genitalia (damaged on HT, lost on PT])
Surstyli both broken, but not fused with EP, inner surstylus with a projection at base ventrally; epandrium deformed; ST8 and m.a. not visible. SES with 20-22 tiny spines, lower border distinct; gonopods not clear, probably very small; hypandrium not connected to EP; phallic guide broadening in the middle, pointed at apex; phallus with membranes, short, trifid, branches curved; ejaculatory apodeme elongated, linear; sperm pump oval.
Female – Unknown.
Distribution – Rwanda, Democratic Republic of Congo.

Eudorylas cupreiventris (Becker, 1914)

Dorylas cupreiventris Becker 1914: 126.

Diagnosis: The shining black thorax and scutellum may be helpful, otherwise a doubtful species.

Type material (not examined): [based on Becker 1914:] **Kenya:** 1 male, HT, Naivasha, train station, 1.900 m, 1st December, 1911 (ZMHB, lost)

Male (translated from Latin)
Head. Antennae black, third segment acuminate. Vertex shining black, face and frons white; eyes contiguous.
Thorax. Thorax and scutellum shining black, not pilose. Humeri yellow, halter brownish yellow.
Legs. Yellow, with black stripe (as a patch) in the middle of the femora. Last tarsal segments black. Ventroapical row of spines missing on femora.
Wing. Fumose, pterostigma dark.
Abdomen. Polished, bare, shining copper coloured. Hypopygium black, indistinctly divided, cleft (probably m.a.) small.
Female – Unknown.
Remarks – Description based on the original, type seems to be lost according to H. Wendt, ZMHB (pers. comm.). Becker (1914: 126) gives the type specimen as female in the line, where the label data are given, but he must have seen a male, since the eyes are touching on the frons ("oculis contiguis"). Hardy (1949*a*) mentions a specimen from West Africa which matches Becker's description, but the identity is doubtful, since Hardy did not see the type either.
Distribution – Kenya, Ghana.

Eudorylas decorus (Hardy, 1950)

(Figs 32A–G, 55P–Q)

Dorilas (Eudorylas) decorus Hardy 1950: 24.

Diagnosis: Third antennal segment long acuminate. Abdomen elongated (especially T2,3), broadest at T5. S7, and edge of EP visible; T6 with special protuberance (Fig.). Surstyli asymmetrical, OS with two projections (in ventral view); epandrium elongated, with round projection in lateral view (Fig.); SES with hairs on each side; phallic guide pointed, with membranous lobes at tip and minute spines at base (facing SES) in lateral view; branches of the phallus very narrow (needle-like) at tip.

Type material: **Democratic Republic of Congo:** 1 male, HT, Congo belge: P.N.A. vers Rweru (Volc. Mikeno) 2400 m,, (Bambous) 26 au 27-vii.1934, G.F. de Witte: 501; 1 female, AT, Congo belge: Kivu, Rutsuru (riv. Musugereza), 1700 m [as "1.100 m" in Hardy 1950], 4-vii-1935, G.F. de Witte: 1607; 1 female, PT, Lac Edouard: E. Rwindl, 15-I-1936, Dr. H. Damas, Parc Nat. Albert (all MRAC); 1 male, PT, same data as HT; 1 male, PT, Congo belge: P.N.A., Tshamugussa (Bweza), 2250m, (Bambous), 10-viii-1934, G.F. de Witte: 527 (both USNM). **Rwanda:** 1 male, PT, Congo belge: Ruanda, Nyabireke (pied volc. Karisimbi), 2400 m, 22-ii-1934, G.F. de Witte: 1184; 1 male, PT, Congo belge: Ruanda, Mt. Tamira (près lac N´Gando), 2600 m, 11-iii-1935, G.F. de Witte: 1308; (both MRAC).

Other material examined: **Democratic Republic of Congo:** 1 male, Congo belge: P.N.U., Lusinga (riv. Lusinga), 14.06.1945, G.F. de Witte: 130-131; 1 female, Congo belge: P.N.U. Mukana (1.810 m), 22-23.04.1949, Mis. G.F. de Witte. 2550a (both MRAC); *1 male, 1 female, PTs, same data as HT, 3.vii-1934, [No.] 469 (both AMNH), which are not listed in Hardy 1950, therefore they are not paratypes.*

Male

Head. Third antennal segment long acuminate; yellow. Face greyish pollinose. Frons, upper part shining black, lower part greyish pollinose; eyes touching for distance equal to 3 times ocellar triangle. Occiput, upper half shining black, lower half greyish pollinose.

Thorax. Humeri yellow. Mesonotum (viewed obliquely from front) slightly greyish pollinose, along anterior margin more greyish, shining black distally; greyish from the side. Scutellum brownish pollinose, apex shining black, with 3-4 pairs of very weakly developed hairs. Dorsocentral hairs very weakly developed. Halter yellow-brown.

Legs. Trochanters, femora, knees, tibiae, tarsal segments yellow, last segment darker; hind tibia slightly thickened in the middle. Ventroapical row of spines: only a few weakly developed hairs on all femora. Subapical (distal) spines on first four tibiae present. No anteromedial hairs on 3rd tibia. Hind trochanter covered by dense pubescence with several erected pale hairs on ventral side. Pulvilli smaller than last tarsal segment.

Wing. Fourth costal section 1-1.8 times as long as third costal section, wing long (1.5 times as long as body length). Cross-vein R-M before 1/3 of discal cell. 4/5 of the pterostigma is coloured. Hairs on tegula absent.

Abdomen. Elongated in general (especially T2,3), broadest at T5. Viewed obliquely from front tergites subshining-shining black. Hairs dispersed, short, white and weakly developed. Lateral spines on first tergite: 1(-3) longer dark hairs. Postabdomen in dorsal view: S7, and edge of EP visible; T5 as long as ST8. Genitalia without dissection: no m.a., ST8 angled on right side, EP and SS swollen, completely yellow.

Genitalia

T6 with special protuberance (Fig.). Surstyli asymmetrical, OS with two projections (in ventral view); epandrium elongated, with round projection in lateral view (Fig.); ST8 roundish, without m.a. SES borders only clear in lateral view, with hairs on each side; gonopods asymmetrical, OG longer, both pointed, in lateral view: rounded; phallic guide broad, sides parallel, lateral view: pointed, with membranous lobes at tip and minute spines at base (facing SES); phallus trifid, at tips very narrow (needle-like); ejaculatory apodeme fan-shaped, flat; sperm pump with two wing-like projections.

Female

As male except for the following characters. Frons, eyes separated; upper part shining black, lower part silver-grey pollinose (distinct border between the two parts) except very narrow black median line. Pulvilli and claws at least 2 times as long as last tarsal segment. Sides of abdominal segments with grey triangles, T1 with 2-3 longer, dark hairs. Female ovipositor (Fig. 55P–Q) globular base, slightly divided into two parts, piercer pointed, area with cerci shining.

Distribution – Democratic Republic of Congo, Rwanda.

Eudorylas denotatus (Hardy, 1959)

(Figs 32H–M)

Dorilas (Eudorylas) denotatus Hardy 1959*a*: 400.

Diagnosis: One erect anteromedial hair on 3rd tibia. Surstyli broad at base in dorsal view, both with distinct basal projections in lateral view. Hypandrial apodeme well developed; phallic guide with two large lobes at tip in ventral view (almost as long as SS), PG distinctly bifurcated in lateral view; ejaculatory apodeme linear; sperm pump with two lateral lobes.

Type material: **South Africa:** 1 male, HT, S. Afr, Cape Prov., Cape Peninsula, Hout Bay Skoorsteenkop, 22.I.51, No. 157; Swedish South Africa Expedition 1950-1951, Brinck-Rudebeck; Insect trap; 1 female, AT, same data, 2.II.51, No 166; 1 male, 1 female, PTs, same data as HT; Type No: 2124: 1-4 (all ZML); 1 female, PT, same data as HT (USNM).

Male

Head. Third antennal segment acuminate; yellow-brown. Face silvery pollinose. Frons, upper part shining black, lower part silvery pollinose except black upper corner; eyes touching for distance equal to 2.5-3.5 times ocellar triangle. Occiput greyish pollinose.

Thorax. Humeri yellow-brown. Mesonotum (viewed obliquely from front) brownish pollinose; slightly greyish from the side. Scutellum brownish pollinose, with 7-8 pairs of pale hairs. Dorsocentral hairs weakly developed. Halter: knob dark brow, stem pale.

Legs. Trochanters and base of femora yellow, femora brown, f3 shining posteriorly, knees, tibiae and tarsal segments yellow, last segment brown. Ventroapical row of 4 spines on f1, 12-14 very short, black spines on f2; no spines on 3rd femur. Subapical (distal) spines on first four tibiae present. One erect anteromedial hair on 3rd tibia. Hind trochanter with 3-4 white hairs on shiny ventral side. Pulvilli as long as last tarsal segment.

Wing. Cross-vein R-M beyond 2/5 of discal cell. Pterostigma fully coloured. Hairs on tegula missing.

Abdomen. Viewed obliquely from front tergites brownish pollinose, hind margins somewhat greyish, sides completely grey. Hairs dispersed, short and weakly developed, mainly on ST8. 4-5 black, lateral bristles on first tergite. Postabdomen in dorsal view: S7 visible; T5 0.8 times as long as ST8. Genitalia without dissection: postabdomen yellowish brown, ST8 enlarged, m.a. elliptic, SS visible, large.

Genitalia

Surstyli broad at base, otherwise long and narrow in dorsal view, both with distinct basal projections in lateral view; ST8 large. SES uncertain; gonopods may be missing; HA well developed; phallic guide with two large lobes at tip in ventral view (almost as long as SS), PG distinctly bifurcated in lateral view; phallus trifid with phallic sheath at base attached to HA; ejaculatory apodeme linear; sperm pump with two lateral lobes.

Female

As male except for the following characters. Frons, eyes separated; silver-grey pollinose on 1/3 close to the antennae and along lateral margins until 2/3, otherwise shining black. Pulvilli and claws about 1.8-2 times as long as last tarsal segment. Female ovipositor (Fig.) stout, base surrounded by enlarged T6, which hides it in lateral view; piercer much longer than base (cf. *E. amuscarium*).

Remarks – This species is related to *E. amuscarium* based on external morphology (3rd antennal segment, ventroapical spines on femora, hair on t3) and shape of genitalia (distally narrowing SS, with hairs at base ventrally, shape of PG, sperm pump and ejaculatory apodeme). They still differ in the size of m.a.; shape of EP, SS and there is no extra structure connected to PG.

Distribution – South Africa.

Eudorylas discretus (Hardy, 1952)

(Figs 33A–G)

Dorilas (Eudorylas) discretus Hardy 1952: 9.

Diagnosis: Third antennal segment long acuminate. Tips of surstyli turned towards ventral side (90°), IS broad, right side pale, probably thin, at the base finger-like protuberance on ventral side (LS as well); hypandrium peculiar shape, one lobe in the middle with striped membranous structures; phallic guide tube-like, with tooth-like structure facing SS in lateral view; phallus trifid, long and coiled.

Type material: **Burundi:** 1 male, HT, Urundi, Bururi, 13-iii-1949, alt. 1950 m, F. François, No 19.700 or 29.700.

Male

Head. Third antennal segment long acuminate (projection as long as 3rd segment); brown. Face silvery shining. Frons, upper part brown to black, lower part silvery shining; eyes touching for distance equal to 4 times ocellar triangle. Occiput, upper half brownish pollinose, lower half silver-brown pollinose.

Thorax. Humeri pale brown. Mesonotum (viewed obliquely from front) brownish pollinose; greyish from the side. Scutellum brownish pollinose, with weakly developed hairs. Dorsocentral hairs also weak. Halter yellowish brown.

Legs. Trochanters and base of femora yellow, femora brown, knees, tibiae yellow, hind tibia slightly curved. Tarsal segments brownish, last segment darker. Ventroapical row of 6-8 short spines on first four femora; no spines on 3rd femur. Subapical (distal) spines on first four tibiae distinct. No anteromedial hairs on 3rd tibia. Hind trochanter with smooth, whitish hairs on ventral side. Pulvilli shorter than last tarsal segment.

Wing. Fourth costal section 1.5 times as long as third costal section. Cross-vein R-M at 2/5 of discal cell. Pterostigma fully coloured. Hairs on tegula *uncertain*.

Abdomen. Viewed obliquely from front tergites brownish pollinose, hind margins and sides greyish. Hairs dispersed, short, whitish and weakly developed. 4 strong, black lateral bristles on first tergite. T5 slightly shorter than ST8. Genitalia without dissection: yellow, thickened.

Genitalia

Surstyli, tips turned towards ventral side (90°), IS broad, right side pale, probably thin, at the base finger-like protuberance on ventral side (LS as well); epandrium distinctly smaller than ST8, broad; ST8 not extending to right side, ridge in the middle. SES very faint, in ventral view joins to GP; gonopods asymmetrical, right side longer, pointed in ventral view; hypandrium peculiar shape, one lobe in the middle with striped membranous structures; phallic guide broad, sides parallel, tube-like, in ventral view tooth-like structure facing SS in lateral view; phallus trifid, branches close to each other, long, coiled; ejaculatory apodeme 3-sided; sperm pump with two flattened projections, otherwise rounded, elliptic.

Female – Unknown.

Remarks.

It is not clear how the projection attaches to IS at the basal part in lateral view.

Distribution – Burundi.

Eudorylas diversus (Hardy, 1949)

(Figs 33H–M)

Dorilas (Eudorylas) diversus Hardy 1949*a*: 29.

Dorilas (Eudorylas) pusillus Hardy 1949*a*: 52, **proposed new synonymy.**

Diagnosis: One or two stronger, erect anteromedial hairs on 3rd tibia. S5 divided. Surstyli hairy, subsymmetrical, flattened, broad at tip. Only lower edge of SES is visible; gonopods subsymmetrical with 3-4 stronger hairs close to tip, phallic guide with distinct lateral projection on the left, tip elongated, pointed; phallus trifid (not divided until apical 1/3), two branches and a membranous part with teeth-like structures.

Type material: **South Africa:** 1 male, HT [no head], Cape Province, Matjesfontein, 1-18.xii.1928., S.Africa, R.E. Turner, Brit. Mus., 1929-15 (BMNH); 1 male, PT, Cape Town, Milnerton, Jan. 1926., ... 1926-71., Paratype No 58388 (USNM); 1 male [HT of *E. pusillus*], S.Africa, Natal National Park, iii.1932, Miss[ion] A. Mackie (BMNH).

Male
Head. Third antennal segment acuminate; dark brown, tip paler. Face silvery pollinose. Frons, upper part shining black, lower part silvery pollinose; eyes touching for distance equal to 2.5-4 times ocellar triangle. Occiput, lower half silvery pollinose, upper half less so.
Thorax. Humeri yellow-brown. Mesonotum (viewed obliquely from front) brownish pollinose, along anterior margin with two silvery patches; brownish with silvery pollinosity on the side. Scutellum brownish pollinose, with 0-8 pairs of short pale hairs. Dorsocentral hairs distinct. Halter pale brown.
Legs. Trochanters and femora dark brown, femora with silver pollinosity and shining black ventrally (f3 posteriorly as well), knees yellowish brown, tibiae and tarsal segments pale brown, last segment darker. Ventroapical row of 2-10 short, weak spines on first four femora; 4-8 stronger, black spines on 3rd femur. Subapical (distal) spines on first four tibiae present. 1-2 stronger, erect anteromedial hairs on 3rd tibia. Hind trochanter with 2-3 longer white hairs on ventral side. Pulvilli slightly shorter than last tarsal segment.
Wing. Fourth costal section 0.5-0.7 times as long as third costal section. Cross-vein R-M between 1/4 and 1/2 of discal cell. Pterostigma fully coloured. One minute dark hair on tegula.
Abdomen. Viewed obliquely from front tergites brownish pollinose, except distal half of T5, which is silvery pollinose, sides: hind margins of T2-4 and lateral part of T5 silvery pollinose. Hairs indistinct. 1-4 black lateral spines on first tergite. Postabdomen in dorsal view: S7 visible; T5 as long as ST8. Genitalia without dissection: enlarged, brownish ST8, with rounded, large m.a. (occupies 3/4 of width of ST8), SS and EP pale brown.
Genitalia
S5 divided. Surstyli hairy, subsymmetrical, flattened, broadening at tip; large m.a., occupying almost half of ST8 (in dorsal view of genitalia). Only lower edge of SES is visible; gonopods subsymmetrical with 3-4 stronger hairs close to tip, in lateral view with 3 setae, smaller hairs at base; hypandrium connected to EP; phallic guide with distinct lateral projection on the left (an additional membranous process may be present on the right), tip elongated, pointed; phallus trifid (not divided until apical 1/3), two branches and a membranous part with teeth-like structures, in lateral view hook-like projection and membranous parts not clear; ejaculatory apodeme linear, slightly broadened at tip; sperm pump ellipsoid, without projections.
Female
As male except for the following characters. Third antennal segment paler, more brown. Frons, eyes separated; silver-grey pollinose except in front of ocellar triangle on upper 1/3 (shining black), also silvery along lateral margins in the middle 1/3 of the frons. Pulvilli and claws about 2 times as long as last tarsal segment. Female ovipositor shining, robust.
Distribution – South Africa.

Eudorylas encerus (Hardy, 1949)

(Figs 34A–F)

Dorilas (Eudorylas) encerus Hardy 1949*a*: 30.
Dorilas (Eudorylas) modicus Hardy 1949*b*: 2, **proposed new synonymy.**

Diagnosis: T5 at least 2 times as long as ST8, distinct yellow band in the middle of EP. Surstyli turned 90° ventrally, epandrium long, robust compared to ST8, bearing a finger-like projection in ventral view; gonopods may be absent or small; hypandrium with bean-like distal lobes; phallic guide with short, roundish structure at tip.

Type material: **Malawi:** 1 male, HT, Nyasaland, Limbe, R.C. Wood, 864, 19.12.16 [in Hardy 1949*a*: 31 as "10.XII.1916"], Pres by Com. Inst. Ent., BM 1953-357 (BMNH). **Democratic Republic of Congo:** 1 male [HT of *D. modicus*], Congo belge: Elisabethville [today: Lumumbashi], 25.IV.1939, H.J. Brédo, I.G. 12548 (ISNB).

Other material examined: **South Africa:** 1 male, RSA: Cape Prov. Patrysberg, N of Citrusdal, 06.10.1994, loc. 7, leg. Roy Danielsson (ZML).

Male
Head. Third antennal segment obtuse; yellow. Face silvery pollinose. Frons, upper part subshining black, lower part greyish pollinose, elongated shining patch in the middle; eyes touching for distance equal to 2.5-3.5 times ocellar triangle. Occiput, upper half brownish pollinose, lower half greyish.
Thorax. Humeri dark brown to black. Mesonotum (viewed obliquely from front) black with brownish pollinosity, along anterior margin with two greyish patches; pale brown from the side with brownish or grey pollinosity. Scutellum subshining black, with 10-12 short, pale hairs. Dorsocentral hairs distinctly visible, but short. Halter yellow-brown, base somewhat darker.
Legs. Trochanters, femora, knees, tibiae and tarsal segments yellow, last segment brown. Ventroapical row of 3-6 short, black spines on first four femora; 4-5 longer spines on 3rd femur. Subapical (distal) spines on first four tibiae *uncertain*. 2-3 erected anteromedial hairs on 3rd tibia. Hind trochanter without hairs or spines on ventral side. Pulvilli shorter or as long as last tarsal segment.
Wing. Fourth costal section 0.8-1.2 times as long as third costal section. Cross-vein R-M at 2/5 of discal cell. Pterostigma fully coloured. Hairs on tegula *uncertain*.
Abdomen. Viewed obliquely from front T1 and anterior half of T2 with stripes, other parts shining black, sides shining, T1,2 pale brown. Hairs dispersed, short and pale. 4-5 longer, pale lateral spines on first tergite in a row. Postabdomen in dorsal view: EP partly visible; T5 at least 2 times as long as ST8. Genitalia without dissection: roundish, m.a. ellipsoid, EP and SS more yellow-brown, distinct yellow band in the middle of EP.
Genitalia
Surstyli turned 90° ventrally, inner edge distinct, long; epandrium long, robust compared to ST8, bearing a finger-like projection in ventral view. SES *uncertain*; gonopods may be absent or small; hypandrium with bean-like distal lobes; phallic guide with short, roundish structure at tip; phallus may be broken, *uncertain*; ejaculatory apodeme slender widening at the end; sperm pump round.
Female – Unknown.
Remarks – Synonymy is proposed based on condition of type specimens, since the date of publication is the same.
Distribution – Malawi, South Africa, Democratic Republic of Congo

Eudorylas excisus (Hardy, 1949)

(Figs 34G–M, 54G–H, V)

Dorilas (Eudorylas) excisus Hardy 1949*a*: 32.
Dorilas (Eudorylas) definitus Hardy 1961: 134, **proposed new synonymy.**

Diagnosis: Surstyli turned ventrally, both with two projections at the end; membranous area large, almost reaching upper edge of ST8. Ventrally on the base of SS and on SES ca. 10 hairs on each side; gonopods asymmetrical, both with ridges; phallic guide with membranous parts at the end covered by microtricha; in lateral view there is a hook pointing towards SS; phallus long, coiled, trifid.

Type material: **Malawi:** 1 male, 1 female, HT, AT [on the same supporting pin], 5.4.16., Ruo Nyasaland, R.C. Wood, 493, Pres by Com. Inst. Ent., BM 1953-357. (BMNH). **Democratic Republic of Congo:** 1 male [HT of *E. definitus*], Congo belge, P.N.G., Miss[ion] H. De Saeger, I/a/3, 7-ii-1950; Réc. H. De Saeger 199; 1 female [AT of *E. definitus*], Congo belge P.N.G, Miss[ion] H. De Saeger; Inimvua, 20-v-1952, H. De Saeger, 3488 (both MRAC).

Other material examined: **Angola:** 1 male, (A17), Tundavala, c15 mls NW. Sa da Bandeira, c.6600', 14°43'S 13°28'E, 3.iii.1972, southern African exp. BM 1972–1 (BMNH). **Kenya:** 2 males, Karura For., Nairobi, 5500 feet, 9–13.xii.1970, A.E. Stubbs, B.M. 1972–211 (BMNH). **Namibia:** 1 male, 1 female, West Caprivi Park, Kwando River: Susuwe, 17°45'37"S 23°20'55"E, 28.ix.-02.x.1998, A.H. Kirk-Spriggs, Malaise trap, dry woodland; 1 female, Rundu district, Simanya, Okavango River, 17°33'17"S 18°32'30"E, 23-24.i.1998, Kirk-Spriggs & Marais, malaise traps, riverine forest (all NMNW); Windhoek, 22°34'S 17°05'E, 8.12.1986, coll. Malaise trap, J. Irish (HNHM). **South Africa:** 1 male, Natal, Richards Bay, 24.10.1994, leg. Roy Danielsson (ZML); 1 male, Tsitsikamma N.P.,

34°51'17"S 23°53'22"E, 08.iv.1998, A.H. Kirk-Spriggs, sweeping understory veg. in coastal rainforest (NMNW).

Male

Head. Third antennal segment acuminate; yellow-brown (arista dark brown). Face silvery pollinose. Frons, upper part shining black, lower part silvery pollinose; eyes touching for distance equal to 3 times ocellar triangle. Occiput, greyish pollinose.

Thorax. Humeri yellowish brown. Mesonotum (viewed obliquely from front) black with brown pollinosity, somewhat silvery along anterior margin; brown with greyish pollinosity on the side. Scutellum black with faint brownish-grey pollinosity, with 4-6 short and very weakly developed white hairs. Dorsocentral hairs weakly developed. Halter yellow, base brown.

Legs. Trochanters and femora yellow with dark brown ring in the middle 1/3-3/5 of the latter, f3 shining posteroventrally, knees, tibiae yellow. Tarsal segments yellow, last segment brown. Ventroapical row of 0-2 and 4-8 very weakly developed dark spines on first and second femora respectively; no spines on 3rd femur. Subapical (distal) spines on first four tibiae present. No anteromedial hairs on 3rd tibia. Hind trochanter with no hairs or spines on ventral side. Pulvilli shorter than last tarsal segment.

Wing. Fourth costal section 0.6-0.8 times as long as third costal section. Cross-vein R-M beyond 2/5 of discal cell. Pterostigma fully coloured. No hairs on tegula.

Abdomen. Viewed obliquely from front tergites brownish dusted, T1 greyish, hind margins brownish dusted, T3,4 with grey patches laterally, distal half of T5 greyish pollinose, sides greyish pollinose. Hairs dispersed, short and weakly developed. Laterally 1-5 dark spines on first tergite. Postabdomen in dorsal view: T6 (or T7) visible; T5 1.4 times as long as ST8. Genitalia without dissection: middle sized ST8, m.a. as an elongated triangle, EP and SS yellow, otherwise black.

Genitalia

Surstyli turned ventrally, both with two projections at the end; epandrium elongated; ST8 extending to the right, membranous area large, almost reaching upper edge of ST8. Ventrally on the base of SS and on SES ca. 10 hairs on each side; gonopods asymmetrical, both with ridges, OG longer; hypandrium with distal part (lobes) turned; phallic guide with membranous parts at the end covered by microtricha; phallus long, coiled, trifid; ejaculatory apodeme flat, fan-shaped (can be linear); sperm pump simple, flat, with two projections at the end. In lateral view PG has a hook pointing towards SS; SES present, although connection to GP is no clear; PH with supporting structure.

Female

As male except for the following characters. Frons, eyes separated, silvery pollinose, except shining black narrow line in the middle. Pulvilli and last tarsal segment (brownish) about the same size; claws 1.5 times as long as pulvilli. No ventroapical spines on femora. Hind trochanter covered with very fine white hairs. Fourth costal section equal to third. Cross-vein R-M almost as far as middle of discal cell. Abdominal T1 is not greyish, sides of tergites in general brownish dusted. Female ovipositor on Fig. 54G–H, V.

Distribution – Democratic Republic of Congo, Malawi, Angola, Kenya, Namibia, South Africa.

Eudorylas facetus (Hardy, 1962)

(Figs 35A–F, 54I)

Pipunculus (Eudorylas) facetus Hardy 1962: 259.

Diagnosis: Fourth costal section short (half the length of third costal section). Cross-vein R-M at 1/4-1/3 of discal cell. Epandrium with uncertain borders around cerci in dorsal view; phallic guide broad at base, narrow at tip in ventral view; narrow and sharply pointed in lateral view. Phallus trifid with supporting structure and setulose membranous lobe. Females have short pulvilli, which is quite rare in Pipunculidae.

Type material: **Madagascar:** 1 male, HT, [Central] Madagascar Tan., Ambohitantely, 10.VI.58, F. Keiser; 1 female, AT, ibid., 11.VI.58 (both NHMB); 1 male, PT, same data as AT (BPBM).

Male
Head. Third antennal segment acuminate; yellow. Face silvery pollinose. Frons covered with glue on HT; eyes touching for distance equal to 3 times ocellar triangle. Occiput silvery pollinose.
Thorax. Humeri dark brown. Mesonotum (viewed obliquely from front) brown; more pollinose from the side. Scutellum brown, with 3-4 pairs of weakly developed hairs. Dorsocentral hairs covered by glue on HT. Halter yellow-brown.
Legs. Entirely yellow (incl. last tarsus). Ventroapical row of spines missing on first four femora; 8-9 very short, black spines on 3rd femur. Subapical (distal) spines on first four tibiae missing. No anteromedial hairs on 3rd tibia. Hind trochanter without hairs or spines on ventral side. Pulvilli shorter than last tarsal segment.
Wing. Fourth costal section 0.5 times as long as third costal section. Cross-vein R-M at 1/4-1/3 of discal cell. Pterostigma coloured on distal 4/5. Hairs on tegula missing.
Abdomen. Elongated, viewed obliquely from front tergites completely shining black, ST8 slightly pollinose. Abdominal hairs missing. Laterally 2-3 weakly developed hairs on first tergite. Postabdomen in dorsal view: T5 1.4 times as long as ST8. Genitalia without dissection: SS yellow, m.a. present, borders *uncertain*.
Genitalia
Surstyli subsymmetrical; epandrium with *uncertain* borders around cerci in dorsal view; ST8 with m.a. (as large as half the width of ST8). SES *uncertain*; gonopods symmetrical, rounded; phallic guide broad at base, narrow at tip in ventral view; narrow and sharply pointed in lateral view. Phallus trifid with supporting structure and setulose membranous lobe; ejaculatory apodeme mushroom-shaped, long; sperm pump round.
Female
As male except for the following characters. Frons, eyes separated; silver-grey pollinose on lower 1/3, otherwise shining black, greyish along lateral margins. Pulvilli and claws shorter than last tarsal segment. Female ovipositor on Fig. 54I.
Remarks – Females have short pulvilli, which is quite rare in Pipunculidae.
Distribution – Madagascar.

Eudorylas falcatus (Hardy, 1949)

(Fig. 55G)

Dorilas (Eudorylas) falcatus Hardy 1949*a*: 33.

Diagnosis: Femora dark brown, first four with shining narrow line ventrally; ovipositor curved, base considerably elongated. Only the female HT is known.

Type material: **Ghana:** 1 female, HT, Obuasi, Ashanti, W.Africa, 31.VII.1907, Dr. W.M. Graham, 1908-245, [hand-written] caught in bushpath (BMNH).

Female
Head. Third antennal segment acuminate; dark brown. Face and frons completely silvery pollinose. Occiput, upper half entirely brown, lower half greyish pollinose.
Thorax. Humeri yellow. Mesonotum (viewed obliquely from front) brownish pollinose, more silvery along anterior margin; silvery pollinose from the side. Scutellum brownish pollinose, with numerous fine whitish hairs, as long as width of t3 at base. Dorsocentral hairs *uncertain*. Halter: base of stem and apical part of knob dark brown, otherwise yellow-brown.
Legs. Trochanters and base of femora brown, femora dark brown, first four with shining narrow line ventrally, knees, tibiae and tarsal segments yellow, last segment brown. Ventroapical row of 8-9 strong, short, black spines on first four femora; 9-10 strong black teeth on 3rd femur, longer than those on other femora. Subapical (distal) spines on first four tibiae absent. No anteromedial hairs on 3rd tibia. Hind trochanter with 6-8 longer white hairs on ventral side. Pulvilli (broad, especially on 1st four legs) 1.5-2 times longer than last tarsal segment.
Wing. Fourth costal section 0.7 times as long as third costal section. Cross-vein R-M at 1/3 of discal cell. Pterostigma almost fully coloured (5/6). Hairs on tegula missing.

Abdomen. Viewed obliquely from front T1,2 greyish pollinose, T3-5 brownish pollinose in the middle (laterally grey), sides greyish pollinose except narrow anterior line on each tergite. Hairs dispersed, whitish. 8-10 strong, black lateral spines on first tergite in a patch. Ovipositor (Fig.) curved, base considerably elongated.
Male – Unknown.
Distribution – Ghana, Democratic Republic of Congo.

Eudorylas femoralis sp. n.

(Figs 35G–L, 54Q)

Diagnosis: Femora with thick ventral protuberance at base. Fourth costal section very short compared to third costal section. ST8 without m.a., with a visible dorsal depression. Surstyli asymmetrical, OS with a round basal lobe in dorsal view. SES with numerous hairs; gonopods asymmetrical, both with medial projections; hypandrium very narrow; phallic guide triangle shaped and with two strong hairs on each side in ventral view, pointed at tip; ejaculatory apodeme flat, broad at tip; sperm pump round.

Type material: **South Africa:** 1 male, HT, Cape Prov, Port Elizabeth, Cape Recife area, 3425BA, 22-27.xii.1985, J.G.H. Londt. Reserve (BMNH); 1 male, PT, Natal, Tamsgate, SE3030CD, 11-20.i.1985, J. Londt, Malaise trap set in riverine bush (BMNH); 1 male, PT, Natal, St. Lucia Nature Res., 2832AD, 18-20.xii.1981, Londt & Stuckenberg, Coastal bush & forest (HNHM).

Other material examined: **South Africa:** 1 female, same data as PT from Tamsgate (BMNH).

Male
Head. Third antennal segment acuminate; brown. Face silvery pollinose. Frons, upper part subshining black, lower part silvery pollinose, except shining black spot in the middle; eyes touching for distance equal to 3.5 times ocellar triangle. Occiput, lower half silvery pollinose, upper half more brownish.
Thorax. Humeri pale brown. Mesonotum (viewed obliquely from front) brownish pollinose, along anterior margin slightly grey; greyish brown from the side. Scutellum brownish pollinose, with 6-7 pairs of pale hairs. Dorsocentral hairs weakly developed. Halter brown.
Legs. Trochanters and base of femora yellow brown, femora dark brown (with thick ventral protuberance at base), knees and tibiae yellow. Tarsal segments yellow, last segment brown. Ventroapical row of 6-9 short, black spines on mid femora; no spines on 1st and 3rd femur. Subapical (distal) spines on first four tibiae present. No or one anteromedial hair on 3rd tibia. Hind trochanter covered with numerous whitish hairs on ventral side. Pulvilli as long as last tarsal segment.
Wing. Fourth costal section 0.4-0.5 times as long as third costal section. Cross-vein R-M beyond 1/3 of discal cell. Pterostigma fully coloured. Hairs on tegula missing.
Abdomen. Viewed obliquely from front tergites brownish pollinose, hind margins greyish laterally, sides completely silvery pollinose. Hairs dispersed, short and weakly developed. Laterally 2-4 longer dark spines on first tergite. Postabdomen in dorsal view: S7 and edge of EP visible; T5 1.2 times as long as T8. Genitalia without dissection: ST8 dark brown, without m.a., dorsal depression visible. EP and SS yellow, SS curved.
Genitalia
Surstyli asymmetrical, OS with a round basal lobe in dorsal view, tips curved ventrally; epandrium as long as ST8; no m.a. SES with numerous hairs, borders uncertain; gonopods asymmetrical, both with medial projections the inner pointed towards SS, the outer towards hypandrium; hypandrium very narrow, lobes uncertain; phallic guide triangle shaped and with strong hairs on each side in ventral view, pointed at tip; phallus trifid, short; ejaculatory apodeme flat, broad at tip; sperm pump round.
Female
As male except for the following characters. Frons, eyes separated; silver-grey pollinose except on the upper half of the frons. Fourth costal section almost as long as the third, cross-vein R-M just before middle of discal cell. First four femora with ventroapical row of 8-10 short black spines (hind femora shining posteriorly). Pulvilli and claws about 2 times as long as last tarsal segment. Female ovipositor on Fig. 54Q.

Remarks – The female may belong to a different species, therefore it is not included in the type series.
Distribution – South Africa.
Etymology – Named after the special shape of the hind femora.

Eudorylas flexus (Hardy, 1949)

(Figs 36A–G, 55H–I)

Dorilas (Eudorylas) flexus Hardy 1949*a*: 34.

Diagnosis: Eyes touching for distance equal to 1.5 times ocellar triangle. Third trochanter with long projection, f3 thickened and bent, hind tibia bent in the middle. T5 0.7 times as long as ST8. Surstyli's inner projection in long; epandrium small, slightly asymmetrical; ST8 very large, without m.a.; phallic guide with hook-like projection on the left in ventral view, membranous ventrally, with minute hairs dorsally; phallus trifid, splitting only on distal part; ejaculatory apodeme parachute-shaped, with 3 lobes; sperm pump with 3 appendages.

Type material: **Namibia:** 1 male, HT, Okahandia, 1-12.i.1928, S.W.Africa, R.E. Turner, Brit. Mus., 1928-61; 1 female, AT, same as HT, 19-29.xii.1927 [in Hardy 1949*a*: 35 as "19-29.III.1927"], No. 1928-53 (both BMNH).

Other material examined: **Namibia:** 1 male, Ghaub 47, 19°28'S 17°00'E, Tsumeb district, 16-26 Jul.1986, J. Irish, Malaise trapping; 1 female Omaruru dist[rict], Ugab R[iver] n[ea]r Brandberg Wes[t], 20°57'39''S 14°07'55''E, 21-24.x.1998, Kirk-Spriggs & Marais, Malaise trap sample (both NMNW).

Male
Head. Third antennal segment acuminate; yellow. Face silvery pollinose. Frons, upper part shining brown, lower part silvery pollinose; eyes touching for distance equal to 1.5 times ocellar triangle. Occiput slightly greyish pollinose.
Thorax. Humeri black. Mesonotum (viewed obliquely from front) probably greyish pollinose (surface greasy); similarly on the side. Scutellum greyish pollinose, almost bare, only some weakly developed pale hairs. Dorsocentral hairs very weakly developed. Halter yellow, base brown.
Legs. Trochanters amber coloured, base of femora yellow, femora brown, knees and tibiae yellow. Third trochanter with long projection, f3 thickened and bent, hind tibia bent in the middle. Tarsal segments yellow, last segment brown. Ventroapical row of 3-6 weak spines on first four femora; no spines on 3rd femur, only some whitish hairs. Subapical (distal) spines on first four tibiae present. No anteromedial hairs on 3rd tibia. Hind trochanter with short whitish hairs on ventral side. Pulvilli slightly longer than last tarsal segment.
Wing. Fourth costal section 1.2 times as long as third costal section. Cross-vein R-M at 1/3 of discal cell. Pterostigma almost fully coloured. Hairs on tegula absent.
Abdomen. Viewed obliquely from front tergites brownish pollinose, sides more silvery pollinose. Hairs missing, 2 dark lateral spines on first tergite. Postabdomen in dorsal view: S7 visible; T5 0.7 times as long as ST8. Genitalia without dissection: ST8 swollen, no m.a., EP and SS yellow and small compared to ST8.
Genitalia
Surstyli subsymmetrical, their inner projection in long; epandrium small, slightly asymmetrical; ST8 very large, without m.a. The borders of SES are not clear, with a patch of hairs on the left and dispersed hairs on the right; gonopods flat and rounded; phallic guide with hook-like projection on the left in ventral view, membranous ventrally, with minute hairs dorsally; phallus trifid, splitting only on distal part, apices pointed; ejaculatory apodeme parachute-shaped, with 3 lobes; sperm pump with 3 appendages.
Female
As male except for the following characters. Frons, eyes separated; silver-grey pollinose except in front of ocellar triangle for length equal to 2-3 times ocellar triangle, colour-change continuous.

Humeri yellow-brown, femora not thickened, trochanters without projection, t3 slightly bent. Pulvilli and claws about 1.5 times as long as last tarsal segment. Abdomen golden-brown pollinose, slightly greyish laterally. Dispersed whitish hairs on segments. Female ovipositor on Fig. 55H–I.
Distribution – Namibia.

Eudorylas gabela sp. n.

(Figs 36H–L)

Diagnosis: Wing with an extra spurious cross-vein closing the pterostigma at the end of the subcostal vein. Fourth costal section very short compared to the third. Surstyli subsymmetrical, bent ventrally; epandrium larger than ST8, broadest in the middle; ST8 small, without m.a. Gonopods short, rounded; hypandrium broad, lobes rectangular, hypandrial apodeme distinct; phallic guide broad at base and with two lobes surrounding PH.

Type material: **Angola:** 1 male, HT, Cachoeiras, 20 mls., SW. Gabela, 18-19.iii.1972. (A32), Southern African Exp. 1972–I (BMNH).

Male
Head. Third antennal segment short acuminate; dark brown. Face silvery pollinose. Frons, upper part subshining black, lower part silvery pollinose, except black line in the middle; eyes touching for distance equal to 3.5 times ocellar triangle. Occiput entirely silvery pollinose, upper half slightly brownish.
Thorax. Humeri dark brown. Mesonotum (viewed obliquely from front) brownish pollinose, along anterior margin slightly greyish; silvery from the side. Scutellum brownish pollinose, with 4-5 pairs of short pale hairs. Dorsocentral hairs weakly developed. Halter dark brown, stem paler.
Legs. Basal half of trochanters brown, distal half of trochanter and base of femora yellow, middle 3/5 of femora brown, tip of femora, knees and tibiae yellow (t3 slightly bent). Tarsal segments yellow, last segment dark brown. Ventroapical row of 5-6 very short dark spines on mid femora; no spines on f1 and f3. Subapical (distal) spines on first four tibiae missing. No anteromedial hairs on 3rd tibia. Hind trochanter covered with whitish, velvet-like hairs on ventral side. Pulvilli as long as last tarsal segment.
Wing. Fourth costal section 0.4 times as long as third costal section. Cross-vein R-M before 1/3 of discal cell. Pterostigma fully coloured, with an extra spurious cross-vein closing the pterostigma at the end of the subcostal vein. Hairs on tegula missing.
Abdomen (already dissected). Viewed obliquely from front tergites (T1,2) brownish pollinose. Hairs dispersed, short and pale. Laterally 3-4 pale hairs on first tergite.
Genitalia
Surstyli subsymmetrical, bent ventrally; epandrium larger than ST8, broadest in the middle; ST8 small, without m.a. SES with numerous minute hairs, borders uncertain; gonopods short, rounded; hypandrium broad, lobes rectangular, hypandrial apodeme distinct; phallic guide broad at base and with two lobes surrounding PH, tip pointed and curved in lateral view; phallus trifid, branches short.
Female – Unknown.
Distribution – Angola.
Etymology – Named after the type locality Gabela in Angola.

Eudorylas galeatus (Hardy, 1949)

(Figs 37A–F, 55R–S)

Dorilas (Eudorylas) galeatus Hardy 1949*a*: 36.

Diagnosis: Surstyli asymmetrical, OS with long projection on inner surface (probably broken on the HT drawn); epandrium long compared to ST8. SES present, with ca. 10 dispersed hairs; phallic guide thick, distally pointing towards SS, membranous lobes at tip; phallus trifid, as long as ST8+EP+SS.

Type material: **South Africa:** 1 male, HT, Port St. John Pondoland, 1-15. April 1924, S.Africa R.E. Turner, Brit. Mus. 1924-213; 1 male, PT, Congella Durban, Ntl 20 2. 27, L. Bevis, Cam. Inst. Eng. BM 1959-499 (both BMNH); 1 male, PT, same data as HT (USNM).

Other material examined: **Democratic Republic of Congo:** 1 male, Congo belge P.N.A. Escarpem de Kabasha, 1500 m, 14.12.1934, G.F. de Witte: 919, R.I.Sc.N.B. I.G. 24.203 (ISNB). **South Africa:** 3 males, 1 female, RSA: Cape Prov., Tsitsikamra NP, Stormsriver Pass, 19.10.1994, loc. 26, leg. Roy Danielsson; 2 males, 2 females, same data, 14-16.10.1994, loc. 20; 2 males, RSA: Cape Prov., Bloukrans Pass, by Vargrivier, 14-16.10.1994, loc. 19., leg. Roy Danielsson (all ZML).

Male
Head. Third antennal segment acuminate; yellow. Face silvery pollinose. Frons, lower part greyish pollinose; eyes touching for distance equal to 2 times ocellar triangle. Occiput greyish pollinose.
Thorax. Humeri brown. Mesonotum (viewed obliquely from front) black with brownish pollinosity; also from the side. Scutellum same as mesonotum, with short and weak hairs. Dorsocentral hairs weakly developed. Halter brown.
Legs. Trochanters and femora, knees, tibiae, tarsal segments yellow, last segment brown. Ventroapical row of 4-6 very small setae on first four femora; no spines on 3rd femur. Subapical (distal) spines on first four tibiae present. No anteromedial hairs on 3rd tibia. Hind trochanter without hairs or spines on ventral side. Pulvilli somewhat shorter than last tarsal segment.
Wing. Fourth costal section 0.8 times as long as third costal section. Cross-vein R-M at 1/3 of discal cell. Pterostigma fully coloured. One small hair present on tegula.
Abdomen. Viewed obliquely from front tergites black with brownish pollinosity, sides with occasional grey patches. Hairs dispersed, short and weakly developed. Lateral spines on first tergite: 1-3 dark hairs. Postabdomen in dorsal view: T5 as long as ST8. Genitalia without dissection: moderately swollen, EP and SS yellow, m.a. elongated, on the right side of ST8 (narrower than half with of ST8).
Genitalia
Surstyli asymmetrical, OS with long projection on inner surface (probably broken on the HT drawn); epandrium long compared to ST8. SES present, with ca. 10 dispersed hairs; gonopods asymmetrical, OG longer; hypandrium connected to EP; phallic guide thick, distally pointing towards SS, membranous lobes at tip; phallus trifid, as long as ST8+EP+SS; ejaculatory apodeme mushroom-shaped, with membranous lobe; sperm pump with 2 distal projections. IS in lateral view bent ventrally, with pale, sclerotized lobe on outer edge.
Female
Ovipositor on Fig. 55R–S.
Remarks – The process on the OS of the HT may have been broken since most of the other specimens studied have longer structure.
Distribution – South Africa, Democratic Republic of Congo.

Eudorylas garambensis (Hardy, 1961)

(Figs 37G–L, 54D)

Dorilas (Eudorylas) garambensis Hardy 1961: 138.
Dorilas (Eudorylas) megacanthus Hardy 1961: 142, **proposed new synonymy.**

Diagnosis: Hind trochanter with 2 black spines posterodorsally. Surstyli subsymmetrical, inner tips pointing towards each other; gonopods subsymmetrical with small hairs; phallic guide with two lateral lobes and (in lateral view) a hook; phallus trifid with teeth.

Type material: **Democratic Republic of Congo:** 1 male, HT, Congo belge P.N.G., Miss[ion] H. De Saeger, II/gd/4, 30-x-1951, Réc. H. De Saeger 2701; 1 female, AT, same as HT, II/fd/17, 13-II-1952, No. 3125; 1 female, PT, same as AT, II/jd/11, 1-IX-1952, No. 4008; 1 male [HT of *E. megacanathus*], Congo belge P.N.G., Miss[ion] H. De Saeger, Ndelele/R, 24-ix-52, H. De Saeger 4075 (all MRAC).

Other material examined: **Botswana:** 1 female, Mochudi (bush), 28.05-9.06.1985, (MV), leg. and det. De Meyer; 1 female, same data, 22-27.05.1985; 1 male, Mochudi, 22-27.05.1985, yellow water trap,

leg. De Meyer (all ISNB); **Comoro Islands:** 1 female, Moheli Island, 3.10.1983; 1 male, same data, 27.09.1983 (both MRAC).

Male
Head. Third antennal segment acuminate; pale brown. Face silvery pollinose. Frons, upper part black, lower part silvery shining; eyes touching for distance equal to 2.5-3 times ocellar triangle. Occiput, upper half black, lower half silvery grey.
Thorax. Humeri pale brown to dark brown. Mesonotum (viewed obliquely from front) shining black, along anterior margin greyish pollinose; brown from the side with greyish pollinosity. Scutellum shining black, with short, pale hairs. Dorsocentral hairs weakly developed. Halter yellow-brown.
Legs. Trochanters and base of femora yellow, femora yellow (distal 2/3 sometimes brown), knees, tibiae, tarsal segments yellow, last segment brown. Ventroapical row of 7-10 strong, black spines on first four femora; 6-8 spines on 3rd femur. Subapical (distal) spines on first four tibiae present, but weakly developed. One anteromedial hair on 3rd tibia. Hind trochanter with 2 black spines posterodorsally. Pulvilli somewhat shorter than last tarsal segment.
Wing. Fourth costal section 0.7-0.9 times as long as third costal section. Cross-vein R-M at 2/5 of discal cell. Pterostigma fully coloured, proximal border as a line. 1-2 black hairs on tegula.
Abdomen. Viewed obliquely from front tergites shining brown, weakly sclerotised. Hairs very weakly developed. Lateral spines on first tergite: 2-4. Postabdomen in dorsal view: T5 1.1 times as long as ST8. Genitalia without dissection: SS yellow, m.a. elongated.
Genitalia
Surstyli subsymmetrical, inner tips pointing towards each other; epandrium short; ST8 enlarged, broad, m.a. large. SES borders only clear in lateral view; gonopods subsymmetrical with small hairs; phallic guide with two lateral lobes and (in lateral view) a hook, and a membranous supporting structure; phallus trifid with teeth; ejaculatory apodeme elongated, broadening in the middle; sperm pump flat, simple.
Female
As male except for the following characters. Frons, eyes separated; silver-grey pollinose on lower half (less so in the median line), shining black on upper half. Pulvilli and claws about 1.5 times as long as last tarsal segment on first leg. One or two erect dark hairs on t3. Tergites on abdomen not weakly sclerotized, two silver patches in the middle of T2 dorsally. Female ovipositor on Fig. 54D.
Distribution – Democratic Republic of Congo, Botswana, Comoro Islands.

Eudorylas ghesquierei (Hardy, 1950)

(Figs 38A–F, 54R)

Dorilas (Eudorylas) ghesquierei Hardy 1950: 29.

Diagnosis: The male's eyes do not touch (they are close to each other for a distance equal to half the length of ocellar triangle). Surstyli broad; phallic guide broad, sides parallel, tip narrowing and with small hairs; phallus trifid with teeth on the branches. The female's pulvilli are as long as the last tarsal segment (may be slightly longer), which is rare in pipunculid females.

Type material: **Democratic Republic of Congo:** 1 male, HT, Congo belge, Eala, XI. 1936, J. Geshquière, 3274, I.G. 10.482 (ISNB).

Other material examined: **Namibia:** 7 males, 1 female, West Caprivi Park, Kwando River: Susuwe, 17°45'37"S 23°20'55"E, 28.ix.-02.x.1998, A.H. Kirk-Spriggs, Malaise trap, dry woodland (NMNW, 2 HNHM).

Male
Head. Third antennal segment acuminate; dark brown. Face silvery pollinose. Frons, upper part shining black, lower part silvery pollinose with subshining median line; eyes do not touch, they are close to each other for a distance equal to half the length of ocellar triangle. Occiput, upper half subshining black behind ocelli, lower half silvery pollinose.

Thorax. Humeri dark brown. Mesonotum (viewed obliquely from front) subshining black, along anterior margin greyish pollinose; silvery pollinose from the side. Scutellum black, with short, pale hairs. Dorsocentral hairs very weakly developed. Halter dark brown.
Legs. Trochanters and base of femora dark brown, femora dark brown and shining ventrally on all legs, knees, tibiae, tarsal segments brown, last segment darker. Only short hairs on first four femora; 6 weak spines on 3rd femur. Subapical (distal) spines on first four tibiae present, but weakly developed. No anteromedial hairs on 3rd tibia. Hind trochanter with short white hairs on ventral side. Pulvilli as long as last tarsal segment.
Wing. No wing on HT. Fourth costal section as long as third costal section. Cross-vein R-M beyond 1/3 of discal cell. Pterostigma fully coloured. Hairs on tegula absent.
Abdomen. Viewed obliquely from front T1 brownish pollinose, T2 with brownish, triangle-shaped patch in the middle, otherwise abdomen shining black. Hairs dispersed, short and weakly developed. Four black lateral spines on first tergite. Postabdomen in dorsal view: T5 1.3 times as long as ST8. Genitalia without dissection: black, medium sized.
Genitalia
Surstyli broad, parallel; ST8 wide, m.a. large. SES borders only clear in lateral view; gonopods asymmetrical, OG longer; phallic guide broad, sides parallel, tip narrowing and with small hairs in ventral view, bent towards SS in lateral view; phallus trifid with teeth on the branches; ejaculatory apodeme short, broadening in the end; sperm pump flat, oval.
Female
The AT of this species is in MRAC; not studied. The ovipositor of a female associated with males was drawn (Fig. 54R).
Remarks – There was one female in the ISNB identified by Hardy (in 1960) as *E. ghesquierei*, but the affinities with the HT were uncertain, since both are damaged specimens.
Distribution – Democratic Republic of Congo, Namibia.

Eudorylas hirsutus sp. n.

(Figs 38G–L)

Diagnosis: Gonopods equally long, OG with short hairs; hypandrium with circular lobes deflected by 45 degrees in ventral view; phallic guide with long lateral hairs (6–7) in ventral view, PG curved towards SS in lateral view; ejaculatory apodeme mushroom shaped.

Type material: **Kenya:** 1 male, HT, "Nyong Forest, 6500' " [hand-written], Nairobi, x.1934., F.W. Edwards, B.M. 1935-203. (BMNH).

Male
Head. Third antennal segment acuminate; brown. Face silvery pollinose. Frons, upper part subshining black, lower part greasy on HT (probably silvery pollinose); eyes touching for distance equal to 3.5 times ocellar triangle. Occiput, lower half silvery pollinose, upper half brownish pollinose.
Thorax. Humeri brown. Mesonotum (viewed obliquely from front) and scutellum brownish pollinose; also brown from the side. Scutellum with very few, short hairs. Dorsocentral hairs weakly developed. Halter brown, stem darker.
Legs. Trochanters, femora, knees and tibiae entirely pale brown (f3 shining ventrally and posteriorly). Tarsal segments brown, last segment dark brown. Ventroapical row of 6-7 short dark spines on first four femora; 4-5 spines on 3rd femur. Subapical (distal) spines on first four tibiae missing. No anteromedial hairs on 3rd tibia. Hind trochanter shining brown ventrally, with 1-2 dark hairs on ventral side. Pulvilli shorter than last tarsal segment.
Wing. Fourth costal section 0.5 times as long as third costal section. Cross-vein R-M at 2/5 of discal cell. Pterostigma fully coloured. Hairs on tegula missing.
Abdomen (already dissected). Viewed obliquely from front tergites (T1, 2) entirely brownish pollinose. Hairs dispersed, short and weakly developed. Laterally three dark spines on first tergite.
Genitalia
Surstyli subsymmetrical, OS broader in dorsal view, both wide distally in lateral view; epandrium narrow; ST8 *deformed*. SES uncertain; gonopods equally long, OG with short hairs; hypandrium with

circular lobes deflected by 45 degrees in ventral view; phallic guide with long lateral hairs (6–7) in ventral view, PG curved towards SS in lateral view; phallus trifid, branches with minute hairs; ejaculatory apodeme broad at tip (mushroom shaped); sperm pump round.
Female – Unknown.
Distribution – Kenya.
Etymology – Named after the distal part of the phallic guide being hairy (from Latin).

Eudorylas inornatus (Hardy, 1949)

(Figs 39A–F)

Dorilas (Eudorylas) inornatus Hardy 1949*a*: 37.

Diagnosis: Two longer anteromedial hairs on 3rd tibia, as long as width of tibia. Surstyli symmetrical, pointing towards each other, and with a row of hairs at base; epandrium wider than long; m.a. as long as half width of ST8; SES with a group of hairs behind PH in ventral view; gonopods subsymmetrical, with hairs on inner edge; phallic guide widening apically, with 3 additional branches laterally; phallus trifid (little teeth visible in lateral view) with membranous supporting structure; ejaculatory apodeme short, "hat"-like; sperm pump little, rounded.

Type material: **Kenya:** 1 male, HT [no head], H.J.A. Turner, Naivasha, 7. [July] 37., BM 1953-357. (BMNH); 1 male, PT, same data as HT (USNM).

Male
Head (no head on HT and PT).
Thorax. Humeri pale brown. Mesonotum (viewed obliquely from front) brownish pollinose, along anterior margin less so; black from the side with faint greyish pollinosity. Scutellum brownish pollinose, with 4-5 pairs of distinct but pale hairs. Dorsocentral hairs very weakly developed. Halter brown.
Legs. Trochanters brown, base of femora yellow-brown, femora black, shining ventrally (on all legs), knees yellow, tibiae yellow-brown with dark rings in the middle, t3 slightly curved, faint thickening in the middle. Tarsal segments yellow-brown, last segment black. Ventroapical row of 10-12 short, stout, black spines on first four femora; 6-8 longer spines on 3rd femur. Subapical (distal) spines on first four tibiae present, but weakly developed. Two longer anteromedial hairs on 3rd tibia, as long as width of tibia. Hind trochanter with white hair on ventral side, and black hair on outer surface as long as width of femur at base. Pulvilli shorter than last tarsal segment on hind leg.
Wing. Fourth costal section 0.9 times as long as third costal section. Cross-vein R-M at 1/3 of discal cell. Pterostigma fully coloured, proximal border as a line. Hairs on tegula absent.
Abdomen. Viewed obliquely from front tergites brownish pollinose, hind margins somewhat greyish laterally. Hairs dispersed, short and weakly developed, longest on ST8. Lateral spines on first tergite: 3-6 in a row. Postabdomen in dorsal view: T5 1.2 times as long as ST8. Genitalia without dissection: round m.a., SS visible in lateral view, yellowish cerci and SS.
Genitalia
Surstyli symmetrical, pointing towards each other, and with a row of hairs at base; epandrium wider than long; ST8 very wide, m.a. as long as half width of ST8. SES borders unclear, with a group of hairs behind PH in ventral view; gonopods subsymmetrical, with hairs on inner edge; phallic guide widening apically, with 3 additional branches laterally; phallus trifid (little teeth visible in lateral view) with membranous supporting structure; ejaculatory apodeme short, "hat"-like; sperm pump little, rounded.
Female – Unknown.
Distribution – Democratic Republic of Congo, Kenya, ?Burundi, Madagascar, Mozambique.

Eudorylas katonae (Kertész, 1907)

Pipunculus katonae Kertész 1907: 581.

Diagnosis: Third antennal segment very long acuminate; all femora silvery pollinose, f3 shining posteriorly. Doubtful, no specimen studied.

Type material (not examined): **Tanzania:** 1 male, HT, Tanzania, Moschi, July, 1905, leg: K. Katona [based on Kertész 1907] (HNHM, lost).

Male (based on the original description)
Head. Third antennal segment very long acuminate; brown-black. Face silvery pollinose. Frons, upper part shining black, lower part silvery pollinose; eyes touching for "quite a long distance" [translated from German]. Occiput greyish pollinose.
Thorax. Humeri yellow-brown. Mesonotum and scutellum greyish brown pollinose, more greyish just behind humeri and thorax from the side. Greyish pollinose below scutellum (metanotum). Halter reddish yellow, knob brown.
Legs. Trochanters and femora black (all femora silvery pollinose, f3 shining posteriorly), tips reddish yellow; tibiae reddish yellow with faint brown ring in the middle. Tarsal segments reddish yellow, last segment black. Pulvilli and claws weakly developed.
Wing. Length: 3.7 mm. Faintly brownish. Fourth costal section 2 times as long as the third. Cross-vein R-M at 1/3 of discal cell. Pterostigma pale brown, incomplete.
Abdomen. Dull black. T1-4 with grey stripes along hind margins, narrowed along median line in dorsal view, completely greyish from the side. T5 asymmetrical, greyish brown pollinose, dark along anterior margin and in the median line. Hypopygium asymmetrical and small, also greyish brown pollinose, somewhat longer on right side. Left part of the hypopygium (T6) only 1/6 of the other (ST8).
Female – Unknown.
Remarks – The species was named after Kálmán Kittenberger who appeared as K. Katona on specimen labels. No type specimen can be found in HNHM due to the fire in 1956 during the revolution in Budapest. Hardy (1949*a*) based his description on the original Kertész (1907) article, since he did not study the type either.
Distribution – Tanzania.

Eudorylas liberia (Curran, 1929)

(Fig. 54A)

Pipunculus liberia Curran 1929: 2.

Diagnosis: Ovipositor yellow-brown; base elongated, brownish pollinose, otherwise shining entirely.

Only the female HT was examined.

Type material: **Liberia:** 1 female, HT, "Paiata, Liberia, Oct 1926" [leg. J. Bequaert] (AMNH).

Female
Head. Third antennal segment acuminate; brown. Face silvery pollinose on lower 2/3 otherwise black. Frons separated, entirely subshining black. Occiput covered by glue (probably silvery pollinose).
Thorax. Humeri pale brown. Mesonotum (viewed obliquely from front) brownish pollinose; brownish from the side. Scutellum brown, with 6-8 pair of weakly developed hairs. Dorsocentral hairs very weakly developed. Halter yellow-brown.
Legs. Trochanters and femora brown-black (f1,2 silvery pollinose posteriorly, shining ventrally, f3 shining posteriorly and ventrally), knees yellow, tibiae yellow-brown on basal 2/3, otherwise dark brown. Tarsal segments yellow-brown, last segment darker. Ventroapical row of 5-6 very short, black spines on f1; 6-7 longer spines on f2,3 (longest on f3). Subapical (distal) spines on first four tibiae missing. No anteromedial hairs on 3rd tibia. Hind trochanter with 3-4 longer, pale hairs on ventral side. Pulvilli longer than last tarsal segment (especially on 1st leg), claws yellow, longer than pulvilli, tips dark brown.

Wing. Fourth costal section 1.2 times as long as third costal section. Cross-vein R-M beyond 2/5 of discal cell, vein M-Cu curved (S-shaped). Pterostigma fully coloured. Two-three hairs on tegula.
Abdomen. Viewed obliquely from front tergites subshining black, except T1 (silvery pollinose), T5,6 with grey patches on both sides. Hairs dispersed, short and weakly developed. Laterally 10-12 dark spines in a patch on first tergite.
Ovipositor (Fig. 54A): Long and stout, yellow-brown; base elongated, brownish pollinose (with dispersed pale hairs), otherwise shining entirely.
Male – Unknown.
Remarks – According to Curran (1929) the type specimen was collected by Dr Joseph Bequaert.
Distribution – Liberia.

Eudorylas libratus (Hardy, 1949)

(Figs 39G–L)

Dorilas (Eudorylas) libratus Hardy 1949*a*: 41.

Diagnosis: Cross-vein R-M just before middle of discal cell. ST8 with a groove dorsally, no m.a. Surstyli asymmetrical, both with basal lobes ventrally; epandrium wider than long; SES with 12-13 hairs on both sides; phallic guide broad, inner surface curved, tip may be broken.

Type material: **South Africa:** 1 male, HT, Mossel Bay, Cape Province, April 1921; S.Africa, R.E. Turner, Brit. Mus. 1921-210 (BMNH); 1 male, PT, same data as HT, 15-28.iii.1922, ...1922-153, Paratype No 58389 (USNM).

Male
Head. Third antennal segment acute, pilose; dark brown. Face silvery pollinose. Frons brownish pollinose; eyes touching for distance equal to 4 times ocellar triangle. Occiput silvery pollinose.
Thorax. Humeri dark brown. Mesonotum (viewed obliquely from front) brownish pollinose, greyish along anterior margin; faintly greyish pollinose from the side. Scutellum brownish pollinose, with 10-12 pairs of pale and short hairs. Dorsocentral hairs very short, but distinct. Halter dark brown.
Legs. Trochanters and base of femora yellow, femora dark brown (f1,2 brownish pollinose, f3 shining pv), knees, tibiae yellow. Tarsal segments brown, last segment darker. Ventroapical row of 2-3 short black spines on f2; no spines on 1st and 3rd femur. Subapical (distal) spines on first four tibiae absent. No anteromedial hairs on 3rd tibia. Hind trochanter covered with minute whitish hairs on ventral side. Pulvilli equal to last tarsal segment.
Wing. Fourth costal section 0.7 times as long as third costal section. Cross-vein R-M just before middle of discal cell. Pterostigma fully coloured. 2-3 whitish hairs on tegula.
Abdomen. Viewed obliquely from front tergites black, pollinose, hind margins: distal 1/4 of T1-4 and 1/2 of T5 greyish pollinose, sides with grey patches. Hairs dispersed, short, white and weakly developed. 2-3 strong, black lateral spines on first tergite. Postabdomen in dorsal view: edge of S7 visible; T5 1.5 times as long as ST8. Genitalia without dissection: ST8 with a groove dorsally, EP and SS yellow, no m.a.
Genitalia
Surstyli asymmetrical, both with basal lobes ventrally; epandrium wider than long; ST8 in dorsal view not very much extending to the right. SES with 12-13 hairs on both sides; gonopods less developed, roundish; phallic guide broad, inner surface curved, tip may be broken; phallus lost; ejaculatory apodeme linear; sperm pump elliptic, with two projections.
Female – Unknown.
Remarks – The drawing in Hardy 1950 (p. 32, Fig. 15a) does not correspond with genitalia of the HT, since relevant parts of additional specimens are shown, which are not *E. libratus*. The "divided" outer surstylus has probably been broken.
Distribution – South Africa, Democratic Republic of Congo.

Eudorylas lobus sp. n.

(Figs 40A–E)

Diagnosis: Lateral spines on first tergite missing. Surstyli asymmetrical, with hairs along ridges on ventral side, OS with two finger-like projections at tip, IS with a basal round protuberance directed ventrally; epandrium with special tooth shaped form around cerci. SES with distinct hairs; gonopods equal in length; phallic guide broad with two distal round lobes, which are bent behind the central process in lateral view.

Type material: **Malawi:** 1 male, HT, Viphia, Chikangawa, 27.-ii.-1.iii.1987, J&A Londt, Grassland & forest margins, SE1133DD (BMNH); 1 male, PT, same data as HT (HNHM); **South Africa:** 1 male, PT, Natal, #46, Midlands, Howick, 29 29'S: 30 13'E, 1060 m, Date: 14.vii.1990, Coll: A.E. Whittington, Garden vegetation (BMNH); 1 male, PT, E. Transvaal, 13km w. Sabie 2530BB, Horseshoe Falls, XII 4, 1976. R. Miller (HNHM).

Male

Head. Third antennal segment acuminate; brown. Face silvery pollinose. Frons, upper part subshining black, lower part silvery pollinose; eyes touching for distance equal to 3 times ocellar triangle. Occiput, lower half silvery pollinose, upper half more brownish.

Thorax. Humeri pale brown. Mesonotum (viewed obliquely from front) brownish pollinose, along anterior margin more greyish; also grey from the side. Scutellum brownish pollinose, 4-5 pairs of short, pale hairs. Dorsocentral hairs weakly developed. Halter brownish yellow.

Legs. Trochanters and femora black (hind femur shining posteriorly), knees and tibiae yellow, tibiae with a dark brown ring in the middle (along 1/4 of tibia). Tarsal segments yellow-brown, last segment black. Ventroapical row of 10-12 dark spines on mid femora; no spines on 1st and 3rd femur. Subapical (distal) spines on first four tibiae present. One very weakly developed anteromedial hair on 3rd tibia. Hind trochanter with numerous velvet-like whitish hairs on ventral side. Pulvilli shorter than last tarsal segment.

Wing. Fourth costal section as long as third costal section. Cross-vein R-M at 1/3 of discal cell. Pterostigma fully coloured. Hairs on tegula missing.

Abdomen. Viewed obliquely from front tergites 2-4 subshining black, hind margins and sides silvery pollinose; T1 and T5 completely grey. Hairs dispersed, short and weakly developed. Laterally spines on first tergite missing. Postabdomen in dorsal view: S7 visible; T5 2 times as long as T8. Genitalia without dissection: ST8 slightly greyish pollinose, no m.a., EP and SS golden brown.

Genitalia

Surstyli asymmetrical, with hairs along ridges on ventral side, OS with two finger-like projections at tip, IS with a basal round protuberance directed ventrally; epandrium as large as ST8, widest in the middle in dorsal view and with special tooth shaped form around cerci; ST8 relatively small. SES with hairs, borders uncertain; gonopods equal in length; phallic guide broad with two distal round lobes, which are bent behind the central process in lateral view; phallus *not found*.

Remarks – Closely related to *E. amanii* sp. n., but gonopods reach higher and the process of the IS is distinctly larger than in *E. amanii* sp. n. The two distal lobes on the phallus are rounded and hairs on the SES are more developed. Both SS with distinct, hairy edges at base in ventral view.

Distribution – Malawi, South Africa.

Etymology – Lobus refers to the two lobe-like lateral extensions of the tip of the phallic guide in ventral view.

Eudorylas luteopilus (Hardy, 1962)

(Figs 40F–L)

Pipunculus (Pipunculus) luteopilus Hardy 1962: 250.

Diagnosis: T6 with an S-shaped process dorsally. Surstyli asymmetrical, OS with a projection towards IS; epandrium enlarged, as long as ST8 in dorsal view, with a projection on the left side in ventral

view (visible also in right lateral view); no m.a.; phallic guide broad, with an unsclerotized lobe towards SS in ventral view and with a membranous part visible in lateral view; ejaculatory apodeme fan shaped; sperm pump round, with two distal tails.

Type material: **Madagascar:** 1 male, HT, [East] Madagascar, Tam., Perinet, 10.IV.58, F.Keiser; 1 female, AT, ibid., 23.IX.58 (both NHMB).

Male
Head. Third antennal segment acuminate; yellow. Face silvery pollinose. Frons, upper part shining black, lower part silvery pollinose; eyes touching for distance equal to 2 times ocellar triangle. Occiput, lower half silvery pollinose, upper half subshining brown-black.
Thorax. Humeri yellow. Mesonotum (viewed obliquely from front) brownish pollinose; silvery from the side. Scutellum brown, with 5-6 pairs of hairs as long as width of f3 at base. Dorsocentral hairs weakly developed, notopleural depression with several pale hairs. Halter yellow-brown.
Legs. Entirely yellow. Ventroapical row of 5-6 spines on f2; spines missing on f1,3. Subapical (distal) spines on first four tibiae present. No anteromedial hairs on 3rd tibia. Hind trochanter without hairs or spines on ventral side. Pulvilli shorter than last tarsal segment.
Wing. Fourth costal section as long as third costal section. Cross-vein R-M just beyond ¼ of discal cell. Pterostigma coloured on distal 3/4. Hairs on tegula missing.
Abdomen. Viewed obliquely from front tergites subshining black entirely. Hairs dispersed, short and pale. Laterally 4 dark bristles on first tergite. Postabdomen in dorsal view: edge of EP visible; T5 as long as ST8. Genitalia without dissection: no m.a., EP and SS yellow, EP enlarged.
Genitalia
T6 with an S-shaped process dorsally. Surstyli asymmetrical, OS with a projection towards IS; epandrium enlarged, as long as ST8 in dorsal view, with a projection on the left side in ventral view (visible also in right lateral view); no m.a. Borders of SES *uncertain*; gonopods asymmetrical, OG longer; hypandrium with small lobes; phallic guide broad, with an unsclerotised lobe towards SS in ventral view and with a membranous part visible in lateral view; phallus short, trifid; ejaculatory apodeme fan shaped; sperm pump round, with two distal tails.
Female
As male except for the following characters. Frons, eyes separated; silver-grey pollinose on lower 1/3 and along margins up to 2/3, otherwise shining black. Pulvilli and claws about 1.5 times as long as last tarsal segment on f1, same length on other femora.
Distribution – Madagascar.

Eudorylas meruensis (Hardy, 1949)

(Figs 41A–F)

Dorilas (Eudorylas) meruensis Hardy 1949*a*: 43.

Diagnosis: Large species. Surstyli bent ventrally and towards each other; epandrium asymmetrical, left side longer, cerci shifted to the right; SES appears to be divided, 20-22 hairs on each side; phallic guide sharply pointed, broadens before end. In lateral view (Fig.) OS with a large process at the base above PG; phallus with supporting structure and a distinct, long process between PG and PH; the trifid part of PH seems to be separated from the rest.

Type material: **Kenya:** 1 male, HT, Van Someren, Meru, 7/43 [July 1943]; Pres. by Com. Inst. Ent. B. M. 1952-299; "Dorilas meruensis Det. 1947 D.E. Hardy" (BMNH); 1 male, PT, same collecting data as HT (USNM).

Male
Head. Third antennal segment acute; yellow (arista brown). Face silvery shining. Frons, upper part very narrow, black, lower part silvery shining; eyes touching for distance equal to 2 times ocellar triangle. Occiput greyish pollinose.

Thorax. Humeri yellow-brown. Mesonotum (viewed obliquely from front) black with brownish pollinosity, somewhat greyish along anterior margin; greyish pollinose from the side. Scutellum black with brownish pollinosity, hairs missing. Dorsocentral hairs very weakly developed. Halter yellow, base somewhat brown.
Legs. Trochanters and base of femora dark brown, femora black, except yellowish distal end (first four femora silvery, f3 shining black on posteroventral side), knees yellow, tibiae pale brown, hind tibia slightly thickened in the middle. Tarsal segments yellowish brown, last segment dark brown. Ventroapical row of 10-12 short black spines on first four femora; 8-10 somewhat longer spines on 3rd femur. Subapical (distal) spines on first four tibiae missing. No anteromedial hairs on 3rd tibia. No hairs on hind trochanter on ventral side. Pulvilli somewhat smaller than last tarsal segment.
Wing. Fourth costal section 1.4-1.5 times as long as third costal section. Cross-vein R-M before 1/3 of discal cell. Pterostigma fully coloured (at least distal 3/4). Hairs on tegula *uncertain* (probably missing).
Abdomen. Viewed obliquely from front T1 and anterior margin of T2 silver pollinose, other tergites faintly so; hind margins shining black with engraved stripes; sides greyish pollinose, particularly T5. Hairs very short and weakly developed. No lateral spines on first tergite, but 2 dark "lobes" at base (seems to protect the base of the halter). Postabdomen in dorsal view: S7 visible; T5 1.5 times as long as ST8. Genitalia without dissection: enlarged, EP brown, SS yellowish; large oval membranous area, as long as 2/3 of height of ST8 in caudal view.
Genitalia
Surstyli bent ventrally and towards each other; the whole epandrium is turned, not symmetrical, left side longer, cerci shifted to the right; ST8 wide. SES appears to be divided, 20-22 hairs on each side; gonopods symmetrical, rounded; hypandrium connected to EP (by a separate sclerite); phallic guide sharply pointed, broadens before end; phallus trifid, not long, curved; ejaculatory apodeme fan shaped; sperm pump with 2 projections. In lateral view (Fig.) OS with a large process at the base above PG; phallus with supporting structure and a distinct, long process between PG and PH; the trifid part of PH seems to be separated from the rest.
Female – Unknown.
Remarks.
Distribution – Kenya.

Eudorylas mikenensis (Hardy, 1950)

(Figs 41G–L, 55N–O)

Dorilas (Eudorylas) mikenensis Hardy 1950: 33.

Diagnosis: Surstyli subsymmetrical, both with lobes in lateral view; SES with 3-4 hairs on both sides; gonopods subsymmetrical, both slightly pointed; phallic guide pointed, with a distinct groove.

Type material: **Democratic Republic of Congo:** 1 male, HT, Congo belge: PNA vers Rweru (Volc. Mikeno), 2400 m, (Bambous), 26 au 27-vii-1934, G.F. de Witte: 501; 1 male, PT, Congo belge: Ruanda, Lac N´Gando (pied Volc. Karisimbi), 2400 m, 9-iii-1935, G.F. de Witte: 1247; 1 female, AT, same data as HT (all MRAC); 2 females, PTs, Congo belge: Kiwu, Rutshuru, 1285m, 1 an 6-vi-1935, G.F. de Witte: 1405 and 1402 [not *E. mikenensis*] (both USNM).

Male
Head. Third antennal segment acuminate; brown. Face greyish pollinose. Frons, upper part shining black, lower part greyish pollinose except at tiny spot in the middle; eyes touching for distance equal to 4 times ocellar triangle. Occiput, upper half brownish pollinose, lower half slightly greyish pollinose.
Thorax. Humeri pale brown. Mesonotum (viewed obliquely from front) brownish pollinose, along anterior margin slightly greyish; brown from the side with greyish pollinosity. Scutellum brownish pollinose, with 2-3 very weakly developed hairs. Dorsocentral hairs very weakly developed. Halter: base and knob brown, stem pale brown.
Legs. Trochanters and base of femora yellow, femora black, knees, tibiae and tarsal segments yellow, last segment brown. Ventroapical row of 8-10 short, black spines on first four femora; 3-4 very weakly

developed hairs on 3rd femur. Subapical (distal) spines on first four tibiae present. No anteromedial hairs on 3rd tibia. Hind trochanter with 4-5 erected pale hairs on ventral side. Pulvilli 0.7 times as long as last tarsal segment.
Wing. Fourth costal section 1.2 times as long as third costal section. Cross-vein R-M at 1/3 of discal cell. Pterostigma fully coloured. Hairs on tegula absent.
Abdomen (*already dissected)*. Viewed obliquely from front tergites brownish pollinose, hind margins and sides as well. Hairs missing. 2-3 dark brown lateral spines on first tergite.
Genitalia
Surstyli subsymmetrical, both with lobes in lateral view; epandrium thickened; ST8 with medium sized m.a. SES with 3-4 hairs on both sides; gonopods subsymmetrical, both slightly pointed; phallic guide pointed, with a distinct groove; phallus trifid, with membranous attachment along the tube until it divides; ejaculatory apodeme flat, apex broadening; sperm pump linear.
Female
As male except for the following characters. Frons, eyes separated; silver-grey pollinose on lower 1/4, otherwise greasy, occiput completely brownish pollinose. Ventroapical spines smaller on first 4 femora, no spines on f3. Fourth costal section 1.6 times as long as 3rd, 2/3 of pterostigma is coloured. Abdomen: lateral 1/3 of T2 greyish pollinose, sides of T3,4 with grey patches. Female ovipositor (Fig. 55N–O): base almost invisible (covered by T6).
Remarks – Two female paratypes from USNM are different in coloration and shape of ovipositor from the AT, therefore they do not belong to this species. Real identity of these cannot be cleared due to the various difficulties with female specimens (see earlier notes).
Distribution – Democratic Republic of Congo, Rwanda.

Eudorylas mutillatus (Loew, 1858)

(Figs 42A–F, 54F, P)

Pipunculus mutillatus Loew 1858: 374 [1860: 355 (as *P. mutilatus*)].
Pipunculus kumamotensis Matsumura 1915: 30 [1916: 380] - syn.: Yano et al. 1984: 56.
Pipunculus hepaticolor Becker 1900: 247 - syn.: Skevington 2003: 660.
Pipunculus cruciator Perkins 1905: 137 - syn.: Skevington 2003: 660.
Pipunculus aequalis Becker 1924: 16 - syn.: Hardy 1968: 456.
Pipunculus matema Curran 1936: 22 - syn.: Hardy 1968: 457.
Dorilas (Eudorylas) quadratus Hardy 1949*a*: 53, **proposed new synonymy.**
Dorilas (Eudorylas) hiatus Hardy 1956: 5. - syn.: Hardy 1968: 457.
Pipunculus (Eudorylas) eremnoptera Hardy 1962: 257, **proposed new synonymy.**
Pipunculus Eudorylas distocruciator Hardy 1966*b*: 441 - syn.: Hardy 1968: 457.
Pipunculus (Eudorylas) ranikhetiensis Kapoor, Agarwal and Grewal 1977: 74 - syn.: Kapoor et al. 1987: 103.
Pipunculus (Eudorylas) kumaonensis Kapoor, Agarwal and Grewal 1977: 74 - syn.: Kapoor et al. 1987: 103.

Diagnosis: T6 visible (sometimes S7 as well); ST8 with dorsal groove on the right side, m.a. small, round (sometimes elliptic) and ventrally oriented. Surstyli asymmetrical, with 6-8 hairs ventrally; SES distinct; gonopods asymmetrical, OG longer, IG with pointed tip; phallic guide with hook-like projection on the right in ventral view; phallus trifid, short and bent in 90°; ejaculatory apodeme flat, mushroom-shaped; sperm pump oval, with two projections.

Type material: **South Africa:** 1 male [HT of *D. quadratus*, no head], E. Cape Prov., Katberg., 4000 ft., xii. 1932; S.Africa: R.E. Turner, Brit. Mus. 1933-69 (BMNH). **Madagascar:** 1 male [HT of *P. eremnoptera*], [Central] Madagascar, Tan., Tananarive, 30.V.58., F. Keiser; 3 males [PTs of *P. eremnoptera*], same data, 5.IX.58, 29.VIII.58, 29.XII.57; 1 female [AT of *P. eremnoptera*], [East] Madagascar, Fia., Ranomafana. 3.VIII.58, F. Keiser (all BMNH). **Solomon Islands:** 1 male [HT of *P. matema*], Matema Island, VII.7.33, Santa Cruz Islands, M. Willows Jr Collector, Templeton Crocker Exped. 1933, type No. 4036 (CAS). **Japan:** 1 male [LT of *P. kumamotensis*], Kumamoto, H.

Kawamura, IX.23.1907; 1 female [PLT of *P. kumamotensis*], same data, IX.24.1907 (both EIHU). **Micronesia:** 1 male [PT of *P. hiatus*], "N. MapID", "YapGroup, Jul-Au50, RJGoss" [Caroline Is.]; 1 male [PT of *P. hiatus*], Babelthuap, Palau Islands, 20 Dec. 1947, wooded peak SW. of Ulimang, Pacific Sci.Board Ent. Surv. of Micronesia, H.S.Dybas leg. (both BPBM). **Nepal:** 1 male [PT of *P. distocruciator*], Taplejung Distr., Sangu. c 6200' [feet], Mixed vegetation by stream in gully. ix-x.1961, Brit. Mus. East Nepal Exp. 1961-62., R.L. Coe Coll., B.M. 1962-177. (BPBM); 1 male, [HT of *P. distocruciator*], Taplejung Distr., Sangu. c 6200' [feet], Mixed vegetation by stream in gully. xi.1961-i.1962, Brit. Mus. East Nepal Exp. 1961-62., R.L. Coe Coll., B.M. 1962-177; 2 females [AT and PT of *P. distocruciator*], same data as PT in BPBM; 1 female [PT of *P.distocruciator*], same data as AT, Between Sangu and Tamrang, Mixed plants by damp cliff in deep river gorge, c. 5200' [feet] 22.xi.1961 (all BMNH).
Other material examined: **South Africa:** Natal, Weenen, H.P. Thomasset (all 8 specimens with label: Pres. by Imp. Inst. Ent. Brit. Mus. 1932-338.): iii-iv.1924 (2 males), i.1924 (1 male), iii-iv.1925 (1 male, 1 female), ii.1925 (1 male, 1 female), iv.1924 (1 female) (all USNM); 1 male, Durban: Natal, vii.1948, [leg.] J.C. Faure, "ARI.Pretoria"; 1 male, S.W.Africa, (W49), Rietfontein, 23 mls. SW Grootfontein, 3.iv.1972, Southern African Exp., B.M. 1972–1 (both BMNH); **Zimbabwe:** 1 male, "S. Rhodesia", XI.27., [handwriting not clear:] "HD3oe", [leg:] A. Cuthbertson (AMNH); 1 male, 1 female, Torina, 4.-18.III.1952, D.O.Afrika Exp. [German East Africa Expedition]; 1 male, Kware b. Moshi, 27.XII.-13.I.1952, D.O. Afrika Exp. (all SMNS); **Comoro Islands:** 1 male, 1 female, Moheli Island, No. 574., Miringoni, Malaise trap in garden 6-12.XI.1983 (both MRAC). **Namibia:** 4 males, Ghaub 47, 19°28'S 17°00'E, Tsumeb district, 16-26 Jul.1986, J. Irish, Malaise trapping (NMNW, 2 HNHM); 1 female, Tsumkwe district, Xawasha pan 19°09'58"S 20°54'40"E, 27.xii.1998, A.H. Kirk-Spriggs, Malaise trap; 1 male, Naukluft park, Naukluft spring, 24°15'78"S 16°14'08"E, 28-30.xi.1997, Kirk-Spriggs & Marais, Malaise trap; 1 male, Okahandja [handwriting not clear], 10.10.71, Gaerdes coll., H26081 (all NMNW). **Botswana:** 1 male, Qwihba Hills, 20°01'S 21°21'E, 11-14.vii.1993, E. Marais, yellow tray (NMNW).

Male

Head. Third antennal segment yellow; acuminate. Face silvery pollinose. Frons, upper part shining black, lower part silvery pollinose (except narrow black median line); eyes touching for distance equal to 2.5 times ocellar triangle. Occiput, lower half silvery pollinose, upper half less so.
Thorax. Humeri pale brown. Mesonotum (viewed obliquely from front) brownish pollinose; silvery from the side. Scutellum brownish pollinose, 3-4 pairs of pale, short hairs. Dorsocentral hairs distinct. Halter yellow-brown.
Legs. Trochanters and base of femora yellow-brown, femora brown (pv f1,2 silvery pollinose, f3 shining brown), knees, tibiae and tarsal segments yellow, last segment brown-black. Ventroapical row of 2-3(-6) very short dark spines on first femora; 5-8 spines on f2; 4-5 longer spines on 3rd femur. Subapical (distal) spines on first four tibiae present (short). No anteromedial hairs on 3rd tibia. Hind trochanter with two to six pale hairs on ventral side as long as basal width of tibia. Pulvilli as long as last tarsal segment.
Wing. Fourth costal section 1.4-1.7 times as long as third costal section. Cross-vein R-M just beyond 1/3 of discal cell. Pterostigma fully coloured. Hairs on tegula absent.
Abdomen. Viewed obliquely from front tergites completely silvery-golden pollinose (may be brown with slightly silver pollinosity). Minute pale hairs occasionally. 1-4 dark lateral spines on first tergite. Postabdomen in dorsal view: T6 visible (sometimes S7 as well); T5 0.8-1 times as long as ST8. Genitalia without dissection: black, SS+EP yellowish, ST8 with dorsal groove on the right side, m.a. small, round (sometimes elliptic) and ventrally oriented.
Genitalia
Surstyli asymmetrical, with 6-8 hairs ventrally; ST8 slightly enlarged. SES distinct; gonopods asymmetrical, OG longer, IG with pointed tip; lobes of hypandrium slightly turned; phallic guide with hook-like projection on the right in ventral view; phallus trifid, short and bent in 90°; ejaculatory apodeme flat, mushroom-shaped; sperm pump oval, with two projections.
Female
As male except for the following characters. Frons, eyes separated; silver-grey pollinose except in front of ocellar triangle for length equal to 0.5 times ocellar triangle. Third antennal segment more

distinctly pointed than in males. Pulvilli and claws about 2-2.5 times as long as last tarsal segment. Fourth costal section 1.2-1.5 times as long as third costal section. Female ovipositor (Fig. 54F, P): piercer curved.
Remarks – No type specimen of *P. mutillatus* was examined, since the type(s) seem(s) to be lost. This species has a projection next to the trifid phallus as well as *E. rubrus*, which might be related to this species. The species can be recognised by the dorsal groove on the ST8 and the coloration of the legs, and after dissection of males the pointed tip of the IG is very distinct.
Distribution – South Africa, Madagascar, Solomon Islands, Japan, Micronesia, Nepal (widespread in all zoogeographical regions)

Eudorylas natalensis (Hardy, 1949)

(Figs 42G–L)

Dorilas (Eudorylas) natalensis Hardy 1949*a*: 45.

Diagnosis: Surstyli's angled tips point towards each other; ST8 enlarged, almost divided by m.a.; gonopods asymmetrical, OG with hairs; phallic guide pointed (also curved in lateral view) and hidden by band-like structure (not membranous); phallus trifid, branches thick; ejaculatory apodeme linear with a swollen "bulb"; sperm pump round with depression in the middle.

Type material: **South Africa:** 1 male, HT, Durban, Natal, Africa, [other side of the same label:] 4457 (AMNH).

Male
Head. Third antennal segment acuminate; brown-black. Face silvery pollinose. Frons, upper part subshining black, lower part black pollinose with shiny spot in the middle; eyes touching for distance equal to 4 times ocellar triangle. Occiput, lower half silvery pollinose, upper half brownish.
Thorax. Humeri black. Mesonotum (viewed obliquely from front) brownish pollinose; also from the side and scutellum, latter without hairs. Dorsocentral hairs weakly developed. Halter black.
Legs. Completely black, f3 shining posteriorly. Ventroapical row of 4 very short black spines on f1, no spines on f2; 3-4 longer pale spines on 3rd femur. Subapical (distal) spines on first four tibiae absent. No anteromedial hairs on 3rd tibia. Hind trochanter without hairs or spines on ventral side. Pulvilli shorter than last tarsal segment.
Wing. Cross-vein R-M at 1/3 of discal cell. Pterostigma fully coloured. Hairs on tegula absent.
Abdomen. Tergites completely brownish pollinose. No hairs, 2-3 lateral bristles on first tergite. Postabdomen in dorsal view: T5 as long as ST8. Genitalia without dissection: m.a. as wide as width of ST8, pv directed.
Genitalia
Surstyli's angled tips point towards each other; epandrium short, rather wide; ST8 enlarged, almost divided by m.a. SES not developed; gonopods asymmetrical, OG with hairs; hypandrium with enlarged lobes; phallic guide pointed (also curved in lateral view) and hidden by band-like structure (not membranous); phallus trifid, branches thick; ejaculatory apodeme linear with a swollen "bulb"; sperm pump round with depression in the middle.
Female – Unknown.
Distribution – Cameroon, South Africa.

Eudorylas parvifrons (Loew, 1858)

Pipunculus parvifrons Loew 1858: 375 [1860: 356]

Diagnosis: Third antennal segment very long acuminate; ocellar triangle unusually small. No specimen examined.

Type material (not examined): **South Africa:** males, "Cap." [leg. Tollin] [based on Loew 1858].

Male (based on Loew 1860, translated from German)
Head. Third antennal segment very long acuminate; black. Face very narrow, much narrower than in *E. aculeatus*, black with inconspicuous white shine. Ocellar triangle exceptionally small, black, somewhat shining. Eyes touching for very long distance, ocelli enlarged in this region (characteristic for females).
Thorax. Mesonotum and scutellum black with brownish grey pollinosity, ventrally and below the scutellum with "pale as ashes" pollinosity.
Legs. Femora black, base and tip brownish yellow. Tibiae and tarsal segments brownish yellow (last tarsus dark brown), tibiae with an uncertain brown ring in the middle.
Wing. Glassy with greyish colour. Fourth costal section about as long as third costal section. Cross-vein R-M slightly beyond 1/3 of discal cell. Pterostigma dark brown, almost fully coloured. The section of the m between the two cross-veins strongly bent.
Abdomen. Black-brown, with silver pollinosity, more greyish on the hind margins laterally. Genitalia without dissection: black brown, somewhat shining.
Female – Unknown.
Remarks – Description based on the original, types (more specimens based on the original description) seem to be lost according to H. Wendt, MNHU. (pers. comm.). The collector of the types is dubious: "B. Sp." is given in Loew 1858: 375, and "Tollin." in Loew 1860: 356.
Distribution – South Africa, Ghana.

Eudorylas pectinatus sp. n.

(Figs 43A–E)

Diagnosis: Surstyli subsymmetrical, with little branches in ventral view; gonopods equal in length, IG hairy at tip, OG with hairs along medial edge in a row; phallic guide with six appendices projecting to different directions; phallus trifid, at least one branch with comb-like ornament.

Type material: **South Africa:** 1 male, HT, Natal, #5G, Pietermaritzburg, 29°36'S: 30°22'E, Date: 22/04[or 09]/1994, Coll: K.R. Cradock (BMNH).

Male
Head. Third antennal segment acuminate; yellow. Face silvery pollinose. Frons, upper part subshining black, lower part silvery pollinose; eyes touching for distance equal to 3 times ocellar triangle. Occiput silvery pollinose, upper half less so.
Thorax. Humeri pale brown. Mesonotum (viewed obliquely from front) covered with silver-brown pollinosity, along anterior margin more greyish; also grey from the side. Scutellum brownish pollinose, with 6-7 pairs of short, pale hairs. Dorsocentral hairs pale, weakly developed. Halter yellow.
Legs. Trochanters, femora, knees and tibiae yellow. Tarsal segments brownish yellow, last segment dark brown. Ventroapical row of 8-9 stout, black spines on first four femora; 6-7 longer spines on 3rd femur. Subapical (distal) spines on first four tibiae missing. One erect anteromedial hair on 3rd tibia. Hind trochanter with 1-2 pale hairs on ventral side. Pulvilli shorter than last tarsal segment.
Wing. Fourth costal section 0.5 times as long as third costal section. Cross-vein R-M before 1/3 of discal cell. Pterostigma fully coloured. Hairs on tegula missing.
Abdomen (already dissected). Viewed obliquely from front tergites (T1,2) brownish pollinose. Hairs dispersed, short and weakly developed. Laterally 6-7 dark spines on first tergite.
Genitalia
Surstyli subsymmetrical, with little branches in ventral view; ST8 with m.a. as wide as 1/3 of its width. SES uncertain; gonopods equal in length, IG hairy at tip, OG with hairs along medial edge in a row; phallic guide with six appendices projecting to different directions; phallus trifid, at least one branch with comb-like ornament.
Female – Unknown.
Distribution – South Africa.
Etymology – Named after the comb-like ventral process on the phallic guide.

Eudorylas pilulus sp. n.

(Figs 43F–J)

Diagnosis: Surstyli asymmetrical, OS with a pointed tip in dorsal view; epandrium elongated. SES with hairy ridges on both sides; gonopods short, both with medial lobes (overlapping in ventral view), IG with pointed tip; phallic guide broad, sides parallel, distal part with three pointed appendices; phallus trifid, coiled.

Type material: **South Africa:** 1 male, HT, Ndumu Reserve, Ingwavuma District, Tongaland, S. Africa, B. & P. Stuckenberg, 1-10 December 1963 (BMNH); 1 male, PT, Natal #37, Royal Natal Nat. Park, 28 41S: 28 56E, 1440 m, Date: 23-28.iii.1991, Coll : J. G. H. Londt, forest margin malaise (HNHM).

Male

Head. Third antennal segment long acuminate; black. Face silvery pollinose. Frons, upper part subshining black, lower part silvery pollinose, except shining black spot in the middle; eyes touching for distance equal to 3.5-4 times ocellar triangle. Occiput, lower half silvery pollinose, upper half more brown.

Thorax. Humeri brown (slightly paler than mesonotum). Mesonotum (viewed obliquely from front) brownish pollinose, along anterior margin more greyish; silvery pollinose from the side. Scutellum brownish pollinose, without hairs. Dorsocentral hairs short, pale. Halter brown.

Legs. Trochanters, femora, knees and tibiae brown. Tarsal segments brown, last segment black. Ventroapical row of spines on femora missing. Subapical (distal) spines on first four tibiae present. No anteromedial hairs on 3rd tibia. Hind trochanter covered with short, velvet-like hairs on ventral side. Pulvilli than last tarsal segment.

Wing. Fourth costal section 0.4-0.5 times as long as third costal section. Cross-vein R-M beyond 2/5 of discal cell. Pterostigma fully coloured. Hairs on tegula missing.

Abdomen (already dissected). Viewed obliquely from front tergites (T1,2) brownish pollinose. Hairs dispersed, short and weakly developed. Laterally 3 dark spines on first tergite.

Genitalia

Surstyli asymmetrical, OS with a pointed tip in dorsal view; epandrium elongated; m.a. as wide as 1/3 of ST8. SES with hairy ridges on both sides; gonopods short, both with medial lobes (overlapping in ventral view), IG with pointed tip; hypandrium with elongated lobes; phallic guide broad, sides parallel, distal part with three pointed appendices; phallus trifid, coiled.

Female – Unknown.

Remarks – Similar to *E. swanengi*, but phallus long, curved, OG larger than IG, with pointed tip; SES not very well developed, arms of surstyli smaller.

Distribution – South Africa.

Etymology – The name pilulus refers to the hairy SS and the SES.

Eudorylas pondolandi Földvári, 2003

(Figs 44A–G)

Eudorylas pondolandi Földvári, 2003: 165.

Diagnosis: Femora dark brown, black, tips yellow-brown (f1,2 silvery pollinose, f3 shining pv). No lateral spines on first tergite. SES with hairs behind PG; gonopods well sclerotized; hypandrium elongated, slightly turned; phallic guide contains two lobes with hole-like structures (may be missing); phallus narrowing very much towards tip; ejaculatory apodeme filiform with basal projection; sperm pump globose.

Type material: **South Africa:** 1 male [PT of *E. aemulus*, no head], HT, Port St. John, Pondoland., 16-28.04.1924, 1924-235 (BMNH).

Other material examined: **Kenya:** 1 male, Karura For., Nairobi, 5500 feet, 9-13.xii.1970, A.E. Stubbs, B.M. 1972-211. (BMNH).

Male
Head. Third antennal segment acuminate; dark brown. Face silvery pollinose. Frons, upper part shining black, lower part subshining; eyes touching for distance equal to 2.5 times ocellar triangle. Occiput, upper half brownish pollinose, lower half silver-grey.
Thorax. Humeri brown, slightly paler than mesonotum. Mesonotum (viewed obliquely from front) brownish pollinose; slightly greyish pollinose from the side. Scutellum brownish pollinose, with dispersed, pale hairs. Dorsocentral hairs very weakly developed. Halter brown, stem darker.
Legs. Trochanters and base of femora dark brown, femora dark brown, tips yellow-brown (f1,2 silvery pollinose, f3 shining pv), knees, tibiae and tarsal segments yellow-brown, last segment dark brown. No ventroapical spines on first four femora; 3-4 indistinct, black spines on 3rd femur. Subapical (distal) spines on first four tibiae present. No anteromedial hairs on 3rd tibia. Hind trochanter with fine, short, white hairs on ventral side. Pulvilli slightly smaller than last tarsal segment.
Wing. Fourth costal section 1.5 times as long as third costal section. Cross-vein R-M at 2/5 of discal cell. Distal 2/3 of pterostigma full coloured. Hairs on tegula *uncertain*.
Abdomen (already dissected). Viewed obliquely from front tergites brownish pollinose, as well as hind margins and sides. No lateral spines on first tergite.
Genitalia
Surstyli separate, IS broken; ST8 broken (m.a. *uncertain*). SES *uncertain*, with hairs behind PG; gonopods well sclerotized; hypandrium elongated, slightly turned, not connected to EP; phallic guide contains two lobes with hole-like structures (not always well developed); phallus short, narrowing very much towards tip; ejaculatory apodeme filiform with basal projection; sperm pump globose.
Distribution – South Africa, Kenya.

Eudorylas porrectus (Hardy, 1949)

(Figs 44H–M)

Dorilas (Eudorylas) porrectus Hardy 1949*a*: 51.

Diagnosis: Fourth costal section 0.6 times as long as third costal section. Cross-vein R-M between 1/3 and 1/2 of discal cell. Hairs on tegula: 6-7 stronger brown setae. T5 3.5-4 times as long as ST8. SES clear, with hairs on border with SS; gonopods symmetrical; hypandrium with broadened lobes; phallic guide narrowing at tip, but rounded, with hairs at base; phallus with very short branches distally and with membranous lobes along the whole PH.

Type material: **Ghana:** 1 male, HT, Obuasi, Ashanti, W.Africa, 27.IX, 1907 [as "29.IX.1907" in Hardy 1949*a*], Dr. W.M. Graham, 1908-245; [hand-written:] "Caught on leaf in dense bush" (BMNH).

Male
Head (no 3rd segment on HT). Face silvery pollinose, except shining black median line on lower half. Frons, upper part subshining black, lower part silvery pollinose with shining black spot in the middle (as large as 2nd segment); eyes touching for distance equal to 3-3.5 times ocellar triangle. Occiput, upper half black, lower half silvery pollinose.
Thorax. Humeri pale brown. Mesonotum (viewed obliquely from front) brownish pollinose, along anterior margin more silvery; brownish from the side. Scutellum brownish pollinose, 6-7 pairs of pale, short hairs. Dorsocentral hairs weakly developed. Halter black, stem yellowish.
Legs. Trochanters and base of femora brown, femora black, knees yellow-brown, tibiae black. Tarsal segments dark brown, last segment black. Ventroapical row of 4 short, black spines on first four femora; 4-5 short, whitish hairs on 3rd femur. Subapical (distal) spines on first four tibiae absent. No anteromedial hairs on 3rd tibia. Hind trochanter covered by short white pubescence on ventral side. Pulvilli as long as last tarsal segment.

Wing. Fourth costal section 0.6 times as long as third costal section. Cross-vein R-M between 1/3 and 1/2 of discal cell. Pterostigma fully coloured. Hairs on tegula: 6-7 stronger brown setae.
Abdomen. Viewed obliquely from front tergites black with brownish pollinosity, hind margins: distal half of T1,5 and distal 1/5 of T2-4 silvery pollinose, sides posteriorly with grey patches. Hairs dispersed, dark, as long as width of t3 at base. 8-10 dark lateral spines in a patch on first tergite and also longer hairs laterally on T2. Postabdomen in dorsal view: T5 3.5-4 times as long as ST8. Genitalia without dissection: ST8 short, black, m.a. posteroventrally directed, rounded triangle, SS yellow-brown.
Genitalia
Surstyli subsymmetrical; ST8 large with distinct m.a. SES clear, with hairs on border with SS; gonopods symmetrical; hypandrium with broadened lobes; phallic guide narrowing at tip, but rounded, with hairs at base; phallus with very short branches distally and with membranous lobes along the whole PH; ejaculatory apodeme linear; sperm pump small, roundish.
Female – Unknown.
Distribution – Ghana, Mozambique, South Africa.

Eudorylas protumidus sp. n.

(Figs 45A–E)

Diagnosis: Surstyli asymmetrical, strongly bent ventrally, both with broad distal parts in lateral view; no m.a. on ST8. Gonopods equal in length, OG with a distinct process, directed medially; phallic guide broad, tip pointed and with a sickle shaped apical appendix on the left in ventral view; phallus trifid, branches short.

Type material: **South Africa:** 1 male, HT, Cape Prov., Pakhuis Pass, east side, 17-VIII-1973, ME Irwin, 600 m, meadow with flowers, 3219Aa (BMNH).

Male
Head. Third antennal segment long acuminate; brown. Face silvery pollinose. Frons, upper part subshining black, lower part silvery pollinose, except shining black spot in the middle; eyes touching for distance equal to 2.5 times ocellar triangle. Occiput, lower half silvery pollinose, upper half more brownish.
Thorax. Humeri pale brown. Mesonotum (viewed obliquely from front) brownish pollinose, along anterior margin more greyish; also greyish from the side. Scutellum brown, with 6-7 pairs of short, pale hairs. Dorsocentral hairs weakly developed. Halter yellow-brown, knob dark brown.
Legs. Trochanters and base of femora yellow, femora brown (shining ventrally), knees and tibiae brownish yellow, t3 slightly bent. Tarsal segments yellow, last segment brown. Ventroapical row of 5-6 short dark spines on mid femora; 3-4 pale hairs on 3rd femur (no spines on f1). Subapical (distal) spines on first four tibiae present. One short dark anteromedial hair on 3rd tibia. Hind trochanter with 1-2 short, pale hairs on ventral side. Pulvilli distinctly shorter than last tarsal segment.
Wing. Fourth costal section as long as third costal section. Cross-vein R-M beyond 1/3 of discal cell. Pterostigma fully coloured. Two pale hairs on tegula.
Abdomen (already dissected). Viewed obliquely from front tergites (T1,2) brownish pollinose. Hairs dispersed, short and weakly developed.
Genitalia
Surstyli asymmetrical, strongly bent ventrally, both with broad distal parts in lateral view; epandrium elongated, almost as long as ST8; no m.a. on ST8. SES missing; gonopods equal in length, OG with a distinct process, directed medially; phallic guide broad, tip pointed and with a sickle shaped apical appendix on the left in ventral view; phallus trifid, branches short.
Female – Unknown.
Distribution – South Africa.
Etymology – Named after the projection (protumidus in Latin meaning protuberant) on the left side of the phallic guide in ventral view.

Eudorylas remiformis (Hardy, 1962)

(Figs 45F–K, 54E)

Pipunculus (Eudorylas) remiformis Hardy 1962: 266.

Diagnosis: Third antennal segment long acuminate. S7 and EP visible in dorsal view of the abdomen. Surstyli subsymmetrical, club shaped and strongly bent ventrally; ST8 very small, without m.a.; gonopods subsymmetrical with distinct hairs around tip; phallic guide blunt at tip in ventral view (with minor hairs on the side on distal 2/3), but curved and pointed in lateral view.

Type material: **Madagascar:** 1 male, HT, [Central] Madagascar Tan., Manjakatompo, 23.IV.58 F. Keiser; 1 female, AT, ibid., Tananarive, 14.VII.58; 1 female, PT, same data as AT; 1 female, PT, same as HT, [East Madagascar] Maroantsetra, 18.XI.57; 1 female, PT [no head, not *E. remiformis*], ibid., Ambohitantely, 11.VI.58 [as "8. VI. 58" in Hardy 1962] (all NHMB).

Male

Head (deformed on HT). Third antennal segment brown; long acuminate. Face silvery pollinose. Frons, upper part shining black, lower part silvery pollinose; eyes touching for distance equal to 3 times ocellar triangle. Occiput silvery pollinose.

Thorax. Humeri yellow. Mesonotum (viewed obliquely from front) brownish pollinose; more silvery from the side. Scutellum brown, with 6-7 pairs of pale hairs. Dorsocentral hairs weakly developed, notopleural depression with pale hairs as long as width of t3 at base. Halter brown.

Legs. Trochanters and base of femora and femora dark brown (f1,2 silvery pollinose, f3 shining black on pv surface), knees yellow-brown, tibiae dark brown except yellowish tip, hind tibia (shape). Tarsal segments yellow, last segment brown. Ventroapical row of spines missing on f1 and f3; 4-6 short, dark spines on f2. Subapical (distal) spines on first four tibiae present. No anteromedial hairs on 3rd tibia. Hind trochanter without hairs or spines on ventral side. Pulvilli shorter than last tarsal segment.

Wing. Fourth costal section 1.7 times as long as third costal section. Cross-vein R-M at 1/3 of discal cell. Pterostigma coloured on distal 3/4. Hairs on tegula missing.

Abdomen. Tergites viewed obliquely from front and hind margins subshining black, sides greyish pollinose. Hairs dispersed, short and weakly developed. Laterally outstanding spines missing on first tergite. Postabdomen in dorsal view: S7 and EP visible; T5 1.25 times as long as ST8. Genitalia without dissection: No m.a., ST8 narrow, SS curved towards abdomen.

Genitalia

Surstyli subsymmetrical, club shaped and strongly bent ventrally; epandrium short and broad; ST8 very small, without m.a. Borders of SES *uncertain*; gonopods subsymmetrical with distinct hairs around tip; hypandrium short, internal structure *uncertain*; phallic guide blunt at tip in ventral view (with minor hairs on the side on distal 2/3), but curved and pointed in lateral view; phallus *uncertain* (may be lost); ejaculatory apodeme linear; sperm pump small, border with sperm duct blurred/inconspicuous.

Female

As male except for the following characters. Frons, eyes separated; silver-grey pollinose on lower ¼, golden-brown up to the middle and the upper half shining black (especially along the median line), along lateral margins slightly pollinose. Pulvilli and claws about 1.5 times as long as last tarsal segment. First abdominal tergite with 2-3 dark brown hairs. Pterostigma of the wing fully coloured. Female ovipositor on Fig. 54E.

Remarks – The PT female from Ambohitantely (without head) belongs to another species based on the shape of the ovipositor (base larger, piercer shorter), longer claws and pulvilli and different wing venation (R-M almost in the middle of discal cell). More exact species identity cannot be given as in other cases when only females are available.

Distribution – Madagascar.

Eudorylas rooibergensis sp. n.

(Figs 46A–F)

Diagnosis: Third antennal segment long acuminate. One erect anteromedial hair on 3rd tibia, and first 4 tibiae with a small (but distinct), erect posteromedial hair. This species can be recognised by the first 4 tibiae having a small (but distinct), erect posteromedial hair; the elongated distal parts of the SS (down curved), the hook of the PG in lateral view and the distinct SES bearing many hairs along its edges.

Type material: **Namibia:** 1 male, HT [# T646], Lüderitz, Rooiberg, 27°38'S 16°28'E, 22-24.ix.1997, Kirk-Spriggs & Marais, malaise trap sample (NMNW).

Male
Head. Third antennal segment long acuminate; dark brown. Face silvery pollinose. Frons, upper part subshining black, lower part silvery pollinose, except tiny, shining black spot in the middle; eyes touching for distance equal to 2 times ocellar triangle. Occiput, lower half silvery pollinose, upper half somewhat brownish.
Thorax. Humeri pale brown. Mesonotum (viewed obliquely from front) brownish pollinose; silvery from the side. Scutellum brown, with 4 pairs of short, pale hairs. Dorsocentral hairs weakly developed. Halter brown, middle of stem yellowish.
Legs. Trochanters and base of femora brown (all femora greyish pollinose, except f3 shining posteriorly), basal ¼ of femora yellow, otherwise dark brown, knees, tibiae and tarsal segments yellow-brown, last segment dark brown. Ventroapical row of 4-5 very small, black spines on mid femora; no spines on 1st and 3rd femur. Subapical (distal) spines on first four tibiae present. One erect anteromedial hair on 3rd tibia, and first 4 tibiae with a small (but distinct), erect posteromedial hair. Hind trochanter with several (8-10) short, white hairs on ventral side. Pulvilli slightly shorter than last tarsal segment.
Wing. Fourth costal section 0.7 times as long as third costal section. Cross-vein R-M just beyond 1/3 of discal cell. Pterostigma fully coloured. Hairs on tegula missing.
Abdomen (already dissected). Hairs dispersed, short and weakly developed. Laterally 2-3 dark brown spines on first tergite. Postabdomen in dorsal view: EP visible. Genitalia without dissection: ST8 globular, no m.a.; slightly yellowish tip of EP and SS.
Genitalia
Surstyli asymmetrical, both with elongated distal parts curved ventrally, IS with an extra hook-like process ventrally at the base; epandrium elongated, cerci narrow. SES distinct, with numerous hairs along sides; gonopods small, slightly pointed; hypandrium narrow, lobes deformed; phallic guide with parallel sides and a down curved hook towards SES in lateral view; phallus as a thick tube, branching (3) only in distal 1/4; ejaculatory apodeme triangle shaped distally; sperm pump flat, with two little projections.
Female – Unknown.
Distribution – Namibia.
Etymology – The name refers to the type locality Rooiberg.

Eudorylas rubrus (Hardy, 1950)

(Figs 46G–L)

Dorilas (Eudorylas) rubrus Hardy 1950: 35.

Diagnosis: Surstyli with long hairs on ventral side; SES narrow, without hairs; phallic guide wide apically with a projection on the right; phallus trifid, small protuberance at branching.

Type material: **Democratic Republic of Congo:** 1 male, HT, Congo belge: Kiwu, Rutshuru (riv. Musugereza), 1100 m, 8-vii-1935, G.F. De Witte: 1631; 1 male, PT, same data as HT, 4-vii-1935, No. 1606 (MRAC).

Other material examined: **Botswana:** 1 male, Moenge college, 24.09.-01.10.1986, MT [Malaise trap], leg. De Meyer (ISNB).

Male
Head. Third antennal segment acuminate; yellow. Face silvery pollinose. Frons, upper part shining black, lower part silvery pollinose; eyes touching for distance equal to 3.5 times ocellar triangle. Occiput, lower half greyish pollinose, upper half less so.
Thorax. Humeri yellow. Mesonotum (viewed obliquely from front) and scutellum golden-yellow pollinose; mesonotum greyish pollinose from the side. Scutellum with 7-8 pairs of short, pale hairs. Dorsocentral hairs weakly developed. Halter yellow.
Legs. Trochanters, femora, knees, tibiae and tarsal segments yellow, last segment brown. Ventroapical row of 5-6 strong, black spines on all femora as long as with of t3 at base (sometimes longer). Subapical (distal) spines on first four tibiae present. No anteromedial hairs on 3rd tibia. Hind trochanter bare on ventral side. Pulvilli slightly shorter than last tarsal segment.
Wing. Fourth costal section 1.6-1.7 times as long as third costal section. Cross-vein R-M beyond 2/5 of discal cell. Pterostigma fully coloured. Hairs on tegula absent.
Abdomen. Viewed obliquely from front tergites shining black, T3,4 with orange-brown ground colour. Hairs dispersed, short and white. 2-3 (6) dark, lateral bristles on first tergite. Postabdomen in dorsal view: T5 1.2 times as long as ST8. Genitalia without dissection: black with golden-yellow pollinosity, m.a. triangle shaped, rounded, SS and tip of EP yellow.
Genitalia
Surstyli slightly asymmetrical, with long hairs on ventral side; ST8 enlarged. SES narrow, without hairs; gonopods subsymmetrical; phallic guide wide apically with a projection on the right; phallus trifid, small protuberance at branching; ejaculatory apodeme flat, apically wide; sperm pump small, linear.
Female – Unknown.
Distribution – Democratic Republic of Congo, Botswana.

Eudorylas scharffi Földvári, 2003

(Figs 47A–F)

Eudorylas scharffi Földvári, 2003: 167.

Diagnosis: Abdominal tergites shining black (except T1, greyish pollinose), sides with small grey patches. Fourth costal section 0.55 times as long as third costal section. Cross-vein R-M at 1/2 of discal cell. Surstyli narrowing towards tip. SES well sclerotized, dark brown; gonopods missing; phallic guide very broad, tip narrow; phallus trifid, short, with thick branches.

Type material: **Tanzania:** 1 male, HT, Uzungwe Mts., Mwanihana Forest above Sanje, 1000 m, 01.viii.1981, M.Stolze & N.Scharff leg; 1 male, PT, Uluguru Mts., Kimboza Forest, 250 m, 18.vii.1981, M.Stolze & N.Scharff leg. (both ZMUC).

Male
Head. Third antennal segment acuminate; pale brown. Face silvery pollinose. Frons, upper part shining black, lower part silvery pollinose, except median little black spot; eyes touching for distance equal to 3.5 times ocellar triangle. Occiput silvery pollinose.
Thorax. Humeri brown. Mesonotum (viewed obliquely from front) brown pollinose; silvery from the side. Scutellum greyish pollinose, without hairs. Dorsocentral hairs weakly developed. Halter yellow, base of stem dark brown.
Legs. Trochanters and base of femora yellow, 3/5 of femora in the middle black, otherwise yellow, knees, tibiae, tarsal segments yellow, last segment black. Ventroapical row of 4-5 short, black spines on f1, 6-8 longer spines on f2; 2-3 spines (longest of the 3 legs) on 3rd femur. Subapical (distal) spines on first four tibiae missing. No anteromedial hairs on 3rd tibia. Hind trochanter with a patch of very fine white hairs on ventral side. Pulvilli shorter than last tarsal segment.

Wing. Fourth costal section 0.55 times as long as third costal section. Cross-vein R-M at 1/2 of discal cell. Pterostigma fully coloured. Hairs on tegula missing.
Abdomen. Viewed obliquely from front tergites shining black, except T1, which is greyish pollinose, sides with small grey patches. Hairs dispersed, short, pale and weakly developed. Laterally 4-5 dark spines in a row on first tergite. Postabdomen in dorsal view: T6, S7 or EP not visible; T5 1.2 times as long as ST8. Genitalia without dissection: shining black, width of m.a. half the width of ST8.
Genitalia
Surstyli narrowing towards tip. SES with *uncertain* borders, well sclerotized, dark brown; gonopods missing; phallic guide very broad, tip narrow; phallus trifid, short, with thick branches; ejaculatory apodeme linear with bulbous end; sperm pump small, round.
Female – Unknown.
Distribution – Tanzania.

Eudorylas semiopacus (Lamb, 1922)

(Figs 47G–L)

Pipunculus semiopacus Lamb 1922: 409.

Diagnosis: One anteromedial hair on 3rd tibia. Surstyli short and flat; gonopods with one protuberance each and with 2 distinct hairs; phallic guide with two flat lobes and a pointed tip in median line; phallus trifid and at least one branch with teeth.

Type material: **Seychelles:** 1 male, LT, Silhouette '08, Seychelles Exp.; Seychelles Is., Pres by Percy Sladen Trust Cttee., B.M. 1922-157; 1 female, PLT, same data, Mahe, '08-9. [as "20. ii. 1909" in Lamb 1922] (both BMNH).

Male
Head. Third antennal segment acuminate; yellow. Face silvery pollinose. Frons, upper part subshining black, lower part silvery pollinose; eyes touching for distance equal to 3.5 times ocellar triangle. Occiput, lower half silvery pollinose, upper half less so.
Thorax. Humeri yellow. Mesonotum (viewed obliquely from front) subshining black, along anterior margin somewhat grey; silvery pollinose from the side. Scutellum subshining black, with numerous black hairs dispersed on the surface. Dorsocentral hairs present with dark hairs in notopleural depression. Halter yellow.
Legs. Trochanters and base of femora yellow, femora dark brown (posteriorly f1,2 silvery pollinose, f3 shiny), knees, tibiae, all tarsal segments yellow. Ventroapical row of 9-10 short black spines on f1, 14 on f2, 7-8 longer ones on f3. Subapical (distal) spines on first four tibiae absent. One anteromedial hair on 3rd tibia. Hind trochanter with 2-3 whitish hairs on ventral side. Pulvilli longer than last tarsal segment.
Wing. Fourth costal section times as long as third costal section. Cross-vein R-M at 2/5 of discal cell. Pterostigma fully coloured. Hairs on tegula absent.
Abdomen. Viewed obliquely from front tergites brown-black (also hind margins), sides greyish on each tergite posteriorly. Numerous brown hairs dispersed as long as width of t3 at base. Six dark lateral bristles on first tergite. Postabdomen in dorsal view: T5 1.5 times as long as ST8. Genitalia without dissection: SS look wide and flat, m.a. as broad as 2/3 of ST8.
Genitalia
Surstyli short and flat. SES not developed; gonopods with one protuberance each and with 2 distinct hairs; phallic guide with two flat lobes and a pointed tip in median line; phallus trifid and at least one branch with teeth; ejaculatory apodeme linear; sperm pump rounded.
Female
As male except for the following characters. Frons, eyes separated; completely silver-grey pollinose. Pulvilli and claws slightly longer than tarsal segment. Abdominal tergites (from front) subshining black, hind margins laterally greyish, sides silvery pollinose, without hairs. Female ovipositor (Fig.) missing on PLT.

Remarks – Lectotypes are hereby designated in order to stabilise the status of the species. Shape of PG is similar to that of *E. garambensis*, but GPs are different.
Distribution – Seychelles Islands.

Eudorylas setiformis (Hardy, 1949)

(Figs 48A–F, 54B, 55K)

Dorilas (Eudorylas) setiformis Hardy 1949*a*: 55.

Diagnosis: Third antennal segment very long acuminate. Legs completely yellow, one anteromedial hair on t3 present (on all tibiae in case of the female). Phallic guide broad towards tip, with hairy protuberances at base; phallus trifid, very long (at least two times as long as postabdomen) and coiled, branches narrow and stick together; ejaculatory apodeme with three lobes, enlarged; part of the ejaculatory duct is coiled as a spiral.

Type material: **Malawi:** 1 female, HT, Mt Mlanje, Nyasaland, 25.XI.1912, S.A. Neave; Pres by Comm. Inst. Ent. BM 1953-357 (BMNH).

Other material examined: **Tanzania:** 1 male, 1 female, East Usambara, Amani, 1000m, 22.i.1977, Zool. Mus., Copenhagen, H. Enghoff, O. Lomholdt, O.Martin leg. (both ZMUC).

Male
Head. Third antennal segment very long acuminate, setiform (hair-like part slightly longer than other part); yellow, elongated part and arista brown-black. Face silvery pollinose. Frons shining black on upper half, silvery pollinose on lower half. Occiput faintly greyish pollinose.
Thorax. Humeri yellow. Mesonotum (viewed obliquely from front) golden yellow pollinose; silvery from the side. Scutellum yellowish with silver pollinosity, with 10-12 pairs of short, pale hairs. Dorsocentral hairs very weakly developed. Halter yellow-brown, stem white.
Legs. Completely yellow, last tarsal segments brown. Ventroapical row of 6 short, black setae on f1, 16-20 on f2; and 2-4 smaller spines on 3rd femur. Subapical (distal) spines on first four tibiae, and one anteromedial hair on t3 present. Hind trochanter silvery pollinose with 2-3 pale hairs on ventral side. Pulvilli as long as last tarsal segment.
Wing. Fourth costal section 1.4–1.5 times as long as third costal section. Cross-vein R-M beyond 2/5 of discal cell. Pterostigma fully coloured. Two-three brown hairs on tegula are present.
Abdomen. Viewed obliquely from front tergites golden-yellow pollinose, sides greyish. Hairs dispersed, distinct and whitish. Laterally 1-2 dark spines on first tergite. Postabdomen in dorsal view: edge of S7 visible; T5 2 times as long as ST8. Genitalia without dissection: M.a. round, as wide as 1/3 of the width of the black ST8, SS and EP paler.
Genitalia
Surstyli subsymmetrical, broadening distally, with teeth-like projections in lateral view; cerci bulging in lateral view; epandrium wider than long; ST8 enlarged, m.a. small, rounded. SES *uncertain*; gonopods symmetrical; hypandrial lobes short; phallic guide broad towards tip, with hairy protuberances at base; phallus trifid, very long (at least two times as long as postabdomen) and coiled, branches narrow and stick together; ejaculatory apodeme with three lobes, enlarged; sperm pump cup-shaped, round; part of the ejaculatory duct is coiled as a spiral.
Female
As female except for the following characters. Frons narrow (1.5-2 times as wide as first ocellus), shining black in front of ocellar triangle, otherwise silvery pollinose (black median line may be present on upper half). Ventroapical row of 4-6 tiny, dark setae on f1,2 and no spines on f3. One anteromedial hair on all tibiae. Pulvilli and claws 2-2.5 times longer than last tarsal segment. Cross-vein R-M just before middle of discal cell. Tergites completely silvery pollinose. Hairs dispersed, pale and at least as long as width of t3 at base. Laterally 3 brown setae on first tergite. Female ovipositor on Fig. 54B, 55K.
Distribution – Malawi, Tanzania.

Eudorylas sinuosus (Hardy, 1949)

(Figs 49A–G, 55T)

Dorilas (Eudorylas) sinuosus Hardy 1949*a*: 56.

Diagnosis: Large species. Third antennal segment obtuse. Surstyli small compared to postabdomen; epandrium very short; ST8 large, m.a. occupies all of ST8, except upper left angle. SES enlarged, with a wide lobe at the end; phallic guide long, with a groove along median line, tip elongated, pointed (in lateral view with 2 teeth towards SS, the lower with numerous hairs); phallus trifid, extremely long, coiled with supporting structure; ejaculatory apodeme fan shaped; sperm pump with two lateral projections (planes of the two latter parts are turned by 90 degrees). The frons of the female narrows in front of the ocellar triangle, and the pulvilli are as long as the last tarsal segment.

Type material: **South Africa:** 1 male, HT, Umbilo, Durban, 22. Xi. 1914 [as "1916" in Hardy 1949*a*], L. Bevis, Pres. by Inst. Ent. BM 1959-499, [separate label:] 1416 (BMNH).

Other material examined: **Tanzania:** 2 males, East Usambara, Amani, 1000 m, 3.02.1977, H. Enghoff, O. Lomholdt, O. Martin leg; 1 male, same data, 2.02.1977; 1 male, same data, 4.02.; 1 male, same data, 5.ii.; 1 male, 1 female, same data, 6.02.; 1 male, same data, 7.02.; 1 female, same data, 25.01.; 1 female, same data, 29.01.; 1 male, Tanzania, East Usambara Mts., Amani, Sigi river, 750 m, 15.07.1980, M Stoltze & N Scharff leg (all ZMUC). **Ghana:** 1 male, "legm. 26/2/69 OWR"; 1 female, "legm. 28/2/69 OWR" (both BMNH).

Male

Head. Third antennal segment obtuse; brown. Face silvery shining. Frons, upper part black, lower part silvery pollinose; eyes not touching. Occiput, upper half black, lower half greyish pollinose.

Thorax. Humeri yellow. Mesonotum (viewed obliquely from front) subshining black; greyish pollinose from the side. Scutellum subshining black, with short, pale pollinosity. Dorsocentral hairs very weakly developed. Halter yellow brown, stem darker.

Legs. Trochanters and base of femora black, femora black (f1,2 silvery grey, f3 shining black posteriorly), knees yellowish, tibiae yellow with dark ring in the middle. Tarsal segments yellow-brown, last segment brown. Ventroapical row of 8-10 very short, black spines on first four femora; 4-6 weak spines on 3rd femur (all femora with short whitish hairs on front/back sides). Subapical (distal) spines on first four tibiae missing. No anteromedial hairs on 3rd tibia. Hind trochanter with faint whitish hairs on ventral side. Pulvilli as long as last tarsal segment.

Wing. Fourth costal section as long as third costal section. Cross-vein R-M at 1/3 of discal cell. Pterostigma: distal 4/5 coloured. Hairs on tegula missing.

Abdomen. Viewed obliquely from front tergites subshining black, anterior 1/3 of T2 silver-grey pollinose, sides with greyish pollinose triangles. Hairs relatively dense, whitish. Lateral spines on first tergite: 4-5 dark bristles. Postabdomen in dorsal view: only ST8 visible; T5 0.7-0.8 times as long as ST8. Genitalia without dissection: black, long ST8, large m.a., EP and SS paler.

Genitalia

Surstyli small compared to postabdomen; epandrium very short, especially on the right side; ST8 large, m.a. occupies all of ST8, except upper left angle. SES enlarged, with a wide lobe at the end; gonopods symmetric, rounded; hypandrium symmetric, narrow, connected to EP; phallic guide long, with a groove along median line, tip elongated, pointed (in lateral view with 2 teeth towards SS, the lower with numerous hairs; phallus trifid, extremely long, coiled (partly drawn), with supporting structure; ejaculatory apodeme fan shaped; sperm pump with two lateral projections (planes of the two latter parts are turned by 90 degrees).

Female

As male except for the following characters. Frons, eyes separated; silver-grey pollinose except in front of ocellar triangle for length equal to 2 times triangle, also narrowing in front of ocelli. Pulvilli and claws about as long as last tarsal segment (not enlarged). Abdominal tergites greyish pollinose,

except distal 1/5 of T2-5, and laterally with grey patches on distal part of tergites. Female ovipositor on Fig. 55T.
Distribution – South Africa, Tanzania, Ghana.

Eudorylas skorpionensis sp. n.

(Figs 50A–F)

Diagnosis: One pale anteromedial hair on 3rd tibia; S7 visible. Eyes touching for distance equal to 1-1.5 times ocellar triangle. The highly asymmetric gonopods are characteristic for this species, IG has a long process curved towards the median line (always with a flap-like structure at the base) and the PG is broad, S-shaped in lateral view.

Type material: **Namibia:** 1 male, HT [# T647], Lüderitz, Skorpion Hill, 27°49'S 16°36'E, 09-12.viii.1997., Marais & Kirk-Spriggs, Malais trap. (NMNW); 2 males, PTs, same data as HT (NMNW, HNHM).

Male
Head. Third antennal segment acuminate; brown, more yellowish towards tip. Face silvery pollinose. Frons, upper part shining black, lower part silvery pollinose; eyes touching for distance equal to 1-1.5 times ocellar triangle. Occiput, lower half silvery pollinose, upper half subshining black.
Thorax. Humeri pale brown. Mesonotum (viewed obliquely from front) subshining black, along anterior margin greyish pollinose; completely silvery from the side. Scutellum subshining black, with 4-5 pairs of short, pale hairs. Dorsocentral hairs weakly developed, notopleuron with several whitish hairs (as long as t3 at base). Halter yellow-brown, stem darker.
Legs. Trochanters and femora brown (all femora shining ventrally, f3 also posteriorly), distal 1/5 of femora and knees yellow, tibiae and tarsal segments yellow-brown, last segment brown. Ventroapical row of 6-7 very short, black spines on mid femora; no spines on 1st femora, only white some hairs on 3rd femur. Subapical (distal) spines on first four tibiae present. One pale anteromedial hair on 3rd tibia. Hind trochanter with several pale hairs on shining brown ventral side. Pulvilli as long as than last tarsal segment.
Wing. Fourth costal section 0.6 times as long as third costal section. Cross-vein R-M just beyond 1/4 of discal cell. Pterostigma coloured on distal 4/5. Hairs on tegula missing.
Abdomen. Viewed obliquely from front tergites brownish pollinose (except T1 being grey), T1-4 greyish pollinose on distal 1/4 in the middle, distal 1/2 laterally; distal half of T5 completely grey, sides silvery pollinose. Hairs dispersed, short and weakly developed. Laterally 2-3 brown spines on first tergite (as long as 2 times the width of f3 at base). Postabdomen in dorsal view: S7 visible; T5 as long as ST8. Genitalia without dissection: ST8 silvery pollinose, roundish, but angled on right side dorsally and with a small depression on the right proximal edge, no m.a., SS and EP yellow.
Genitalia
Surstyli short, asymmetrical; epandrium enlarged; ST8 narrow, without m.a. SES developed, without distinct hairs; gonopods highly asymmetrical, IG with a long process bent medially (the base of the process bears always a flap-like structure), OG very small, rounded; hypandrium with elongated lobes; phallic guide broad, narrowing towards tip, S-shaped in lateral view; phallus supported by membranous structures, trifid, strongly curved, but not coiled distally; ejaculatory apodeme triangle shaped; sperm pump oval, with two lateral projections.
Female – Unknown.
Remarks
The PG of this species may be interpreted as the OG, since it is lateral in position and no other structure is present between the two gonopods. In this case the PG would be missing (reduced).
Distribution – Namibia.
Etymology – The species was named after the hill where the type specimens have been caught.

Eudorylas swanengi Földvári, 2003

(Figs 50G–N)

Eudorylas swanengi Földvári, 2003: 162.

Diagnosis: Third antennal segment long acuminate. One distinct anteromedial hair on 3rd tibia. Edge of S7 visible in dorsal view; T5 1.8-2 times as long as ST8. Surstyli very broad at base, with hairs as long as SS in the middle, tip hooked; epandrium rounded around cerci, otherwise rectangular at distal end; no membranous area. SES very distinct, with 12-15 hairs ventrally; phallic guide with three hook-like projections at tip in ventral view, with tooth-like projection towards SS; phallus coiled; ejaculatory apodeme 3-sided (with 3 lobes); sperm pump has oval base with 3 projections; phallic sheath possibly present.

Type material: **South Africa:** 1 male [PT of *E. aemulus*, no head], HT, S. Africa, Natal, Ingogo, 03.1932, Miss[ion] A. Mackie, Pers by Com. Inst. Ent. B.M. 1952-299. (BMNH).

Other material examined: **Botswana:** 1 male, Serowe, Swaneng, 01.1986 (MT), leg. De Meyer (in alcohol, ISNB); 1 male, Serowe, 08.1989, leg. De Meyer (ISNB). **Namibia:** 1 male, Tsumkwe district, Nama, 19°54'34"S 20°44'08"E, 20-22.xii.1998, Kirk-Spriggs, Marais & Mann, Malaise traps (NMNW); 1 male, Quqali River, 1801S 2218E, West Caprivi park, 06.IV.1990, E. Marais (HNHM).

Male

Head. Third antennal segment long acuminate; yellow-brown. Face silvery pollinose. Frons, upper part shining black, lower part silvery pollinose, except tiny black spot; eyes touching for distance equal to 2.5-3 times ocellar triangle. Occiput, lower half silvery pollinose, upper half less so.

Thorax. Humeri pale brown. Mesonotum (viewed obliquely from front) black with brownish pollinosity, along anterior margin more greyish; from the side greyish pollinose. Scutellum black with brownish-grey pollinosity, 3-4 pairs of distinct, short, pale hairs. Dorsocentral hairs *uncertain*. Halter brown, stem darker.

Legs. Trochanters and femora dark brown (pv surface of f3 shining), knees, tibiae and tarsal segments yellow-brown, last segment dark brown. Ventroapical row of minute dark hairs, mainly on f2; pv some white hairs along f3. Subapical (distal) spines on first four tibiae distinct. One distinct anteromedial hair on 3rd tibia. Hind trochanter with fine, pale hairs on ventral side. Pulvilli equal to last tarsal segment.

Wing. Fourth costal section 0.85 times as long as third costal section. Cross-vein R-M beyond 2/5 of discal cell. Pterostigma fully coloured. Hairs on tegula *uncertain*.

Abdomen. Viewed obliquely from front the ground colour is brown with greyish pollinosity, T2 sometimes brownish. Hairs on abdomen very few and short; 1-3 dark lateral bristles on first tergite. Postabdomen in dorsal view: edge of S7 visible; T5 1.8-2 times as long as ST8. Genitalia without dissection: brown in general, no m.a.

Genitalia

Surstyli very broad at base, with hairs as long as SS in the middle, projections at base ventrally, tip of SS hooked; epandrium roundish around cerci, otherwise rectangular at distal end; no membranous area. SES very distinct, with 12-15 hairs ventrally, strongly connected to SS; gonopods asymmetrical, OG is broader; hypandrium elongated, not connected to EP; phallic guide with three hook-like projections at tip in ventral view, with tooth-like projection towards SS; phallus coiled; ejaculatory apodeme 3-sided (with 3 lobes); sperm pump oval base with 3 projections; phallic sheath possibly present, may be damaged on specimen from Natal.

Female – Unknown.

Distribution – South Africa, Botswana, Namibia.

Eudorylas tanzaniensis sp. n.

(Figs 51A–G)

Eudorylas tanzaniensis Földvári, in press

Diagnosis: Scutellum with 6-8 pairs of longer pale hairs. Legs yellow, all femora shining posteriorly. T6 with a bent process; S7, EP visible. Surstyli asymmetrical OS with projection; epandrium with thickening on the left side in ventral view; SES clearly visible with numerous hairs; phallic guide with membranous lobe and slightly pointed tip.

Type material: **Tanzania:** 1 male, HT, Uzungwa Mts, Mwanihana Forest above Sanje, 1000m, 01.viii.1982., M. Stolze & N. Scharff leg. Zool. Museum, Copenhagen; 1 female, AT, same data as HT, 1700m, 10.ix.1984; 2 males, PT's, same data as HT; 2 males, PT's, same data as HT except year: 1981 (all ZMUC, 1PT HNHM).

Other material examined: **Uganda:** 1 male, Mt. Sabinio, 7.000 ft., F.W. Edwards, Kigezi Dist., ".xi.1934", B.M.E. Afr. Exp. B.M. 1935–203 (BMNH); **Kenya:** 1 male, Kakamega Forest, 5200 feet, 18.xii.1970, [leg.] A.E. Stubbs, B.M. 1972– 211 [label by Hardy: "? sp. n."] (BMNH).

Male

Head. Third antennal segment long acuminate; yellow, arista black. Face silvery pollinose. Frons, upper part shining black, lower part silvery pollinose; eyes touching for distance equal to 2 times ocellar triangle (in case if two PTs eyes do not touch). Occiput, lower half silvery pollinose, upper half subshining black.

Thorax. Humeri pale brown. Mesonotum (viewed obliquely from front) and scutellum brownish pollinose, as well as thorax from the side. Scutellum with 6-8 pairs of longer pale hairs. Dorsocentral hairs well developed. Halter brown, stem paler.

Legs. Entirely yellow, all femora shining posteriorly, hind tibia curved and slightly thicker in the middle in posterior view. Tarsal segments yellow, last segment brown. Ventroapical row of 5-6 spines on mid femora; no spines on 1st and 3rd femur. Subapical (distal) spines on first four tibiae present. No anteromedial hairs on 3rd tibia. Hind trochanter with several white hairs on ventral side (as long as half width of t3 at base). Pulvilli as long as last tarsal segment.

Wing. Fourth costal section 0.9-1.3 times as long as third costal section. Cross-vein R-M at 1/3 of discal cell. Pterostigma coloured on distal 4/5. Hairs on tegula missing.

Abdomen. Viewed obliquely from front first tergite brownish pollinose, other tergites shining black, also on hind margins and on the sides. Hairs dispersed, short and weakly developed. Laterally 2-4 dark spines on first tergite. Postabdomen in dorsal view: S7, EP visible; T5 as long as ST8. Genitalia without dissection: ST8 angled on the right, no m.a, EP and SS yellow.

Genitalia

T6 with a bent process (slightly variable in shape). Surstyli asymmetrical OS with projection; epandrium elongated, with thickening on the left side in ventral view; ST8 rather small, without m.a. SES clearly visible with numerous hairs; gonopods asymmetrical, OG longer; phallic guide with membranous lobe and slightly pointed tip; phallus trifid, short; ejaculatory apodeme mushroom-shaped; sperm pump round, with two processes.

Female

As male except for the following characters. Frons, eyes separated; silver–grey pollinose on lower half, shining black on upper half. Pulvilli and claws about 1.5 times as long as last tarsal segment. Subapical distal spine very distinct. The tergites of the abdomen are more subshining black with faint brownish pollinosity.

Distribution – Tanzania, Uganda, Kenya.

Eudorylas umbrinus (Loew, 1858)

(Figs 51H–M)

Pipunculus umbrinus Loew, 1858: 374 [1860: 354]

Diagnosis: Third antennal segment long acuminate. S7, EP visible, abdomen swollen distally, without m.a. Surstyli broad at base, pointed at tip; margins of SES clear, with numerous hairs (on both side); gonopods almost symmetric, IG more rounded; phallic guide broad at base in ventral view (broader in lateral view) and pointed at tip, with distinct hairs in the middle.

Type material: **South Africa:** 1 male, HT, Caffraria [3 hand-written labels:] ".B." or ".3.", "234", "168", [typewritten label:] "Pipunculus umbrinus" (NHRS).

Male

Head. Third antennal segment long acuminate; yellow-brown. Face subshining black. Frons, upper part shining black, lower part silvery pollinose; eyes touching for distance equal to 3.5 times ocellar triangle. Occiput, lower half silvery pollinose, upper half more brownish.

Thorax. Humeri pale brown. Mesonotum (viewed obliquely from front) brownish pollinose; silver-grey from the side. Scutellum brown, without hairs. Dorsocentral hairs very weakly developed. Halter pale brown.

Legs. Entirely yellow (probably parts of the femora used to be brown on HT), f3 shining pv. Ventroapical row of 6-7 very short spines on f2; spines missing on f1,3. Subapical (distal) spines on first four tibiae present. No anteromedial hairs on 3rd tibia. Hind trochanter without hairs or spines on ventral side. Pulvilli as long as last tarsal segment.

Wing. Fourth costal section 0.8 times as long as third costal section. Cross-vein R-M at 1/3 of discal cell. Pterostigma fully coloured. Dark hairs on tegula present (2).

Abdomen. Viewed obliquely from front tergites brownish pollinose, hind margins and sides slightly greyish. Hairs missing on abdomen. Laterally 3 black bristles on first tergite. Postabdomen in dorsal view: S7, EP visible; T5 0.8 times as long as ST8. Genitalia without dissection: abdomen swollen distally, no m.a., EP and SS yellow.

Genitalia

Surstyli broad at base, pointed at tip; ST8 with *uncertain* borders. Margins of SES clear, with numerous hairs (on both side); gonopods almost symmetric, IG more rounded; phallic guide broad at base in ventral view (broader in lateral view) and pointed at tip, with distinct hairs in the middle; phallus trifid, curved, with membranous supporting structure; ejaculatory apodeme fan shaped; sperm pump round with two projections.

Female – Unknown.

Remarks – The type specimen was collected during a Swedish expedition to southern and south-eastern Africa led by J.A. Wahlberg. The numbers refer to particular localities, but the list of localities had disappeared and correct labels had never been produced according to Thomas Pape, NHRS (pers. comm.). The specimen is from "Caffraria", which refers to a large part of current South Africa. Loew 1858 (p. 374) gives the type locality as "Caffraria (Wahlb.)", but does not mention the number of specimens he had studied.

Distribution – South Africa.

Eudorylas unanimus (Hardy, 1949)

(Figs 52A–F)

Dorilas (Eudorylas) unanimus Hardy 1949*b*: 4.

Diagnosis: Trochanters and femora black (all legs shining ventrally), knees yellow, tibiae yellow-brown on basal half, distally brown. Vein Cu-M sharply bent (intruding into discal cell). SES present, but borders *uncertain*; gonopods symmetric, pointed; phallic guide with a hook on the right (in lateral

view with additional supporting structure); phallus trifid, short, branches close to each other (with teeth on one of the branches in lateral view); phallic sheath present.

Type material: **Democratic Republic of Congo:** 1 male, HT, Congo-Belge, Rutshuru, 6-XII-1937, J. Ghesquiere (sic!), I.G. 10.482 (ISNB).

Male
Head. Third antennal segment acuminate; dark brown. Face silvery pollinose along margins, subshining black in the middle. Frons, upper part subshining black, lower part silvery pollinose; eyes touching for distance equal to 3 times ocellar triangle. Occiput, upper half brownish pollinose, lower half more silvery pollinose.
Thorax. Humeri brown, paler than mesonotum. Mesonotum (viewed obliquely from front) subshining black; also black from the side with greyish pollinosity. Scutellum black, paler on margins, with very weakly developed hairs. Dorsocentral hairs weakly developed. Halter yellow brown.
Legs. Trochanters and femora black (all legs shining ventrally), knees yellow, tibiae yellow-brown on basal half, distally brown. Tarsal segments yellow-brown, last segment black. Ventroapical row of 6-8 short, stout spines on first four femora; 8 spines on 3rd femur, 2 times longer than on other legs. Subapical (distal) spines on first four tibiae absent. No anteromedial hairs on 3rd tibia. Hind trochanter covered with weak white hairs on ventral side. Pulvilli shorter than last tarsal segment.
Wing. Fourth costal section 0.6 times as long as third costal section. Cross-vein R-M at 2/5 of discal cell. Vein Cu-M sharply bent (intruding into discal cell). Pterostigma fully coloured. Hairs on tegula *uncertain*.
Abdomen. Viewed obliquely from front tergites completely black. Hairs dispersed, short and weakly developed. Lateral spines on first tergite: 3-5 strong, black bristles. Postabdomen in dorsal view: T5 1.3 times as long as ST8. Genitalia without dissection: thickened, dark brown.
Genitalia
SES present, but borders *uncertain*; gonopods symmetric, pointed (some hairs at tips and along inner edges may be present); phallic guide with a hook on the right (in lateral view with additional supporting structure); phallus trifid, short, branches close to each other (with teeth on one of the branches in lateral view); ejaculatory apodeme linear, but thickened; sperm pump elliptic with projection; phallic sheath present.
Female – Unknown.
Remarks – There were two females in the ISNB identified by Hardy (in 1951) as *E. unanimus*, but the affinities with the HT were uncertain, since they have been collected in different years and at different localities. Therefore no formal female description is given here.
Distribution – Burundi, Democratic Republic of Congo.

Eudorylas vicarius (Hardy, 1949)

(Figs 53A–F)

Dorilas (Eudorylas) vicarius Hardy 1949*a*: 60.

Diagnosis: Abdominal tergites entirely silvery pollinose, sides golden-yellow pollinose; edge of S7 visible in dorsal view. Genitalia without dissection: black, with golden-yellow pollinosity. Surstyli broad, OS (in dorsal view) with two projections; SES large, with numerous hairs (up to 18); gonopods asymmetrical, IG more developed; phallic guide with protuberances and numerous hairs, the round projection facing SS bears hairs as well; phallus trifid, one of the branches shorter.

Type material: **Malawi:** 1 male, HT, Nyasaland., Cholo., R.C. Wood; Pres by Com Inst Ent, BM 1953-357 (BMNH).

Male
Head. Third antennal segment acuminate; yellow-brown. Face silvery pollinose. Frons, upper part shining black, lower part silvery pollinose with black patch in the middle; eyes touching for distance equal to 4 times ocellar triangle. Occiput *uncertain* (greasy on HT).
Thorax. Humeri yellow. Mesonotum (viewed obliquely from front) brownish pollinose; yellow-brown from the side. Scutellum brownish pollinose, 4-6 pairs of short pale hairs. Dorsocentral hairs weakly developed. Halter yellow-brown.
Legs. Trochanters, femora, knees, tibiae, tarsal segments yellow, last segment brownish yellow. Ventroapical row of 4-5 (on f1) and 10-12 (on f2) short black spines; no spines on 3rd femur. Subapical (distal) spines on first four tibiae absent. No anteromedial hairs on 3rd tibia. Hind trochanter with 8-10 white hairs as long as width of t3 at base. Pulvilli slightly shorter than last tarsal segment.
Wing. Fourth costal section 0.7 times as long as third costal section. Cross-vein R-M beyond 1/3 of discal cell. Pterostigma fully coloured. Hairs on tegula absent.
Abdomen. Viewed obliquely from front tergites entirely silvery pollinose, sides golden-yellow pollinose. Minute whitish hairs dispersed. 3 dark lateral spines on first tergite. Postabdomen in dorsal view: edge of S7 visible; T5 as long as ST8. Genitalia without dissection: black, with golden-yellow pollinosity, m.a. as an elongated ellipse, EP and SS yellow.
Genitalia
Surstyli broad, OS (in dorsal view) with two projections; epandrium rather long, but robust; ST8 with medium sized m.a. SES large, with numerous hairs (up to 18); gonopods asymmetrical, IG (in ventral view) more developed; phallic guide with several projections and numerous hairs, the round projection facing SS with hairs as well; phallus trifid, one of the branches shorter; ejaculatory apodeme linear, broadening distally; sperm pump small, with a membranous lobe and a projection.
Female – Unknown.
Distribution – Madagascar, Malawi.

Eudorylas wittei (Hardy, 1950)

(Figs 52G–L, 55U)

Dorilas (Eudorylas) wittei Hardy 1950: 39.

Diagnosis: Scutellum shining black, 6-9 pairs of short, pale hairs (as long as width of t3 at widest). Abdominal tergites shining black. Hairs dense, whitish, longest on T5 and distal part of T4. Lateral spines on first tergite present as a patch of 8-10 long hairs. Surstyli highly asymmetrical, with numerous hairs ventrally; ST8 enlarged, with narrow m.a.; gonopods asymmetrical; hypandrium short, hypandrial apodeme well developed; phallic guide pointed at tip and with protuberance on the right side covered with thick hairs; in lateral view with membranous part; phallus trifid, branches long, not separating from each other; ejaculatory apodeme flat, broad at tip; sperm pump with two wing-like projections.

Type material: **Rwanda:** 1 male, HT, Congo belge: Ruanda, Kundhuru ya Tsuve, (Col Gahinga-Sabinyo), 2600 m, (Bambous), 15-ix-1934, G.F. de Witte: 601; 1 female, AT, same data as HT, 18-ix-1934, [No.] 611; 2 males, 2 females, PTs, same data as HT, Rutabagwe, 13-14-ix-1934, [No.] 595; 1 female, PT, Congo belge: Ruanda, Kansenze (pied Volc. Karisimbi), 2400 m, 4-iii-1935, G.F. de Witte: 1209 (all MRAC); 1 male, PT, same data as HT, Rutabagwe, 13-14-ix-1934, 2600 m, [No.] 595 (AMNH). **Democratic Republic of Congo:** 2 males, PTs, Congo belge: PNA, Nyakibumba, (près Kikere), 2226 m, 9-vii-1934 [as "2250 m 5.VII.1934" in Hardy 1950], G.F. de Witte: 478; 3 males, PTs, Congo belge: P.N.A., Nyarusambo (Kikere), 2226m, 28-29.vi.1934 [as "VII" in Hardy 1950], G.F. de Witte: 453 (all USNM); 1 male, PT, same data as the specimen before (AMNH).

Other material examined: **South Africa:** 1 male, RSA: Cape Prov. Nature's valley, at Groot Rivier, 33° 58′ S, 23° 33′ E, 15-17.10.1994, loc 21, leg. Roy Danielsson (ZML). **Rwanda:** *1 female, PT, Congo belge: Ruanda, Nyabitsindi (entre Volc. Bishoke-Musule), 2400 m, 18-II-1935, G.F. de Witte: 1159 (MRAC), it is not listed in Hardy 1950, therefore it is not paratype.*

Male

Head. Third antennal segment acuminate; yellow, arista shining black. Face silvery pollinose. Frons, upper part shining black, lower part silvery pollinose; eyes touching for distance equal to 2 times ocellar triangle. Occiput, upper half subshining black, lower half silvery pollinose.

Thorax. Humeri yellow. Mesonotum (viewed obliquely from front) subshining black, faintly greyish pollinose; silver grey from the side. Scutellum shining black, 6-9 pairs of short, pale hairs (as long as width of t3 at widest). Dorsocentral hairs distinct. Halter yellow-brown.

Legs. Trochanters, femora brown (may be more yellow, in this case dorsal surface of femora always brown), knees, tibiae, tarsal segments yellow, last segment brown. Ventroapical row of 2-4 short black spines on first four femora; no spines on 3rd femur. Subapical (distal) spines on first four tibiae distinct. No anteromedial hairs on 3rd tibia. Hind trochanter covered with short, white hairs on ventral side. Pulvilli shorter than last tarsal segment.

Wing. Fourth costal section 0.7-1.1 times as long as third costal section. Cross-vein R-M at 1/4 to 2/5 of discal cell. Pterostigma fully coloured. Hairs on tegula absent.

Abdomen. Viewed obliquely from front tergites shining black. Hairs dense, whitish, longest on T5 and distal part of T4. Lateral spines on first tergite present as a patch of 8-10 long hairs. Postabdomen in dorsal view: T5 1.1 times as long as ST8. Genitalia without dissection: shining black with whitish hairs dorsally, SS and EP yellow, m.a. oval.

Genitalia

Surstyli highly asymmetrical, with numerous hairs ventrally; ST8 enlarged, with narrow m.a. SES *uncertain*; gonopods asymmetrical, outer longer; hypandrium short, hypandrial apodeme well developed; phallic guide pointed at tip and with protuberance on the right side covered with thick hairs; in lateral view with membranous part; phallus trifid, branches long, not separating from each other; ejaculatory apodeme flat, broad at tip; sperm pump with two wing-like projections.

Female

As male except for the following characters. Frons, eyes separated; silver-grey pollinose on lower half, shining black on upper half. Pulvilli only slightly longer than last tarsal segment. Female ovipositor on Fig. 55U.

Distribution – Rwanda, Democratic Republic of Congo, South Sfrica.

e) *Key to Afrotropical Eudorylini*

Genus *Claraeola*

1. Gonopods symmetrical. Phallus trifid with apical projection covered by scale-like setae. SES well developed, hairy; PG pointed, with minute hairs just below apex. Large species, wings dark brown. ..... *Claraeola nigripennis* (Hardy, 1949)
– Gonopods asymmetrical, phallus without projection. 2

2. Surstyli asymmetrical, outer surstylus having two pointed tips. SES clear, with distinct long hairs, PG broad, with pointed tip and membranous structures bearing scale-like hairs. .... *Claraeola hadrosoma* (Hardy, 1962)
– Surstyli symmetrical, always with one tip. 3

3. Gonopods long, with hairy projections, PG short, curved and pointed at tip. Branches of phallus longer. ..... *Claraeola francoisi* (Hardy, 1952)
– Gonopods short, without hairy projections. PG long slightly curved, blunt at tip. Phallus broad at base, branches very short. ..... *Claraeola sicilis* Skevington, 2002

Genus *Clistoabdominalis*

1. Hypandrium deflected in ventral view, gonopods weakly developed. 2
– Hypandrium straight in ventral view, gonopods well developed. 3

2. Phallic guide broad and flat, with small protuberances in ventral view. Base of surstyli without protuberances. Cross-vein basally situated, pterostigma extremely reduced, eyes separated in males. ..... *Clistoabdominalis confusoides* (Lamb, 1922)
– Phallic guide only broad at base, pointed at tip. Surstyli with protuberances at base in dorsal view. ..... *Clistoabdominalis crassus* (Bezzi, 1926)

3. Gonopods asymmetrical, outer gonopod longer; sides of phallic guide parallel, tip rounded; ejaculatory apodeme and sperm pump parachute-like (as in *E. flexus*). Scutellum silvery pollinose, with 7-8 pairs of strong hairs. Hind femur much thicker than others and curved. .... *Clistoabdominalis lomholdti* Földvári, 2003
– Gonopods highly asymmetrical, since the outer gonopod has a large, flat, spiny lobe. S7 is visible in dorsal view without dissection. Two subapical (distal) spines on mid tibiae of both sexes. .... *Clistoabdominalis namibiensis* **sp. n.**

Genus *Dasysorylas*

1. Tips of surstyli elongated, curved strongly ventrally. 2
– Tips of surstyli rounded, not curved ventrally. 5

2. Phallic guide with a pointed projection on the left side in ventral view. Gonopods well developed, pointed; outer gonopod with a lobe extending towards phallic guide. ... *Dasydorylas bodocsi* **sp. n.**
– Phallic guide without pointed projection in ventral view. Gonopods less developed, rounded. 3

3. Phallic guide with thick hairs, visible in lateral and ventral views, bent towards SS. Surstyli subsymmetrical, each with an appendage on the side in dorsal view. All tibiae with a dark spine anteromedially (sometimes only short hairs present). ..... *Dasydorylas evanidus* (Hardy, 1949)
– Phallic guide without thick hairs. 4

4. Phallic guide narrowing towards tip, S-shaped in lateral view. Surstyli large, both hook-shaped in lateral view and with extended basal lobes; No anteromedial hairs on 3rd tibia. .... *Dasydorylas turneri* (Hardy, 1949)
– Phallic guide short, straight, rather wide apically and with folded membranes, tip pointed in lateral view. 3-4 outstanding dark hairs anteromedially on 3rd tibia. .... *Dasydorylas sordidatus* (Hardy, 1950)

5. Phallic guide with one spine on each side, pointed; phallus longer than SS, curved. ST8 with narrow m.a. SES with 12-14 little spines; gonopods symmetric, with 1-2 minute hairs on each side. Femora and tibiae dark brown to black. ..... *Dasydorylas quasidorsalis* (Hardy, 1961)
– Phallic guide without spines, pointed or not; phallus shorter than SS, m.a. broad. 6

6. Gonopods with at least 3 hairs on each side. Phallus with and extra structure, phallic guide broad at tip. Two very distinct erect hairs on t3 anteromedially and 3-4 dark spines in a row on the hind trochanters ventrally. ..... *Dasydorylas okongoensis* **sp. n.**
– Gonopods without hairs, phallus without extra structure. 7

7. Phallic guide has parallel sides in ventral view, slightly curved and pointed in lateral view. Phallus with teeth on one of the branches. ST8 enlarged compared to epandrium, m.a. broad. Three to four erect anteromedial hairs on 3rd tibia. ..... *Dasydorylas africanus* (Lindner, 1956)
– Phallic guide pointed and with lobes in ventral view (curved towards SS in lateral view); tubes of the phallus very thin. Eyes touching for distance equal to 5-6 times ocellar triangle. Fourth costal section very short (0.5 times the length of C3). T5 3 times as long as ST8. .... *Dasydorylas minymerus* (Hardy, 1962)

Genus *Eudorylas*

The following eight species are not included in the key, since they have no male representatives or we could not study types specimens: *Eudorylas abdominalis*, *E. angustus*, *E. bredoi*, *E. cupreiventris*, *E. falcatus*, *E. katonae*, *E. liberia*, *E. parvifrons*.

1. Two strong bristles on 3rd tibia at the apex anteriorly. T5 4 times as long as ST8. Epandrium with pointed structure around cerci. SES distinct, with minute hairs; gonopods hairy, small, symmetric; phallic guide with numerous hairs laterally in ventral view. ..... *Eudorylas bisetosus* (Hardy, 1962)
– Hind tibia without apical bristles. Genitalia different. 2

2. Third antennal segment long acuminate (projection at least as long as the third segment). 3
– Third antennal segment at most acuminate (projection shorter than third segment). 15

3. Hind tibia with an anteromedial hair. 4
– No anteromedial hair on hind tibia. 7

4. First four tibiae with a small (but distinct), erect posteromedial hair. SS elongated and bent ventrally, OS very broad at base, PG hooked in lateral view and SES with numerous hairs along edges. ..... *Eudorylas rooibergensis* **sp. n.**
– First four tibiae without posteromedial hair, genitalia different. 5

5. Surstyli completely symmetrical in ventral and lateral views. Phallic guide with hairy protuberances at base; phallus very long (at least two times as long as postabdomen) and coiled, branches stick together; part of the ejaculatory duct is coiled as a spiral. Legs entirely yellow. .... *Eudorylas setiformis* (Hardy, 1949)
– Surstyli at least slightly asymmetrical. 6

6. SES without hairs. Gonopods equal in length, OG with a distinct process, directed medially; phallic guide with a sickle-shaped apical appendix on the left in ventral view; branches of phallus short. ..... *Eudorylas protumidus* **sp. n.**
– SES with 12-15 very distinct hairs ventrally. Phallic guide with three hook-like projections at tip in ventral view, with tooth-like projection towards SS in lateral view; phallus coiled. .... *Eudorylas swanengi* Földvári, 2003

7. SES without hairs. 8
– SES with at least 3-4 pale hairs. 9

8. Gonopods much shorter than PG, hairless. Tips of surstyli turned ventrally, at the base with finger-like protuberance; hypandrium peculiar shape with one lobe in the middle; phallic guide tube-like, with tooth-like structure facing SS in ventral view; phallus long and coiled. .... *Eudorylas discretus* (Hardy, 1952)
– Gonopods longer than PG, with distinct hairs around tip. Surstyli club shaped and strongly bent ventrally; ST8 very small, without m.a.; phallic guide blunt at tip in ventral view, but curved and pointed in lateral view. ..... *Eudorylas remiformis* (Hardy, 1962)

9. Epandrium with lateral projection on the right side in dorsal view (also visible in lateral view, see Fig. 32A, Fig. 51A). 10
– Epandrium without such a projection. 11

10. Gonopods pointed; T6 with linear protuberance; surstyli asymmetrical, OS with two projections (in ventral view). Abdomen elongated, broadest at T5. ..... *Eudorylas decorus* (Hardy, 1950)
– Gonopods rounded; T6 with a bent process; surstyli asymmetrical, OS with one projection. Legs yellow, all femora shining posteriorly. ..... *Eudorylas tanzaniensis* **sp. n.**

11. Apical lobes of gonopods flat with little "holes", outer edges with zigzag pattern. ST8 very large; thick hairs at base of SS; phallic guide shorter than GP, rounded at tip. In ventral view both SS with an edge along middle line. ..... *Eudorylas aethiopicus* (Hardy, 1949)
– Gonopods smooth, without "holes". 12

12. Epandrium about as long as wide in dorsal view. 13
– Epandrium longer than wide in dorsal view. 14

13. Phallic guide broad at the end and with little protuberances in the middle in ventral view; gonopods well developed, rounded. Surstyli equal in length, both with ventral projections at base. .... *Eudorylas aemulus* (Hardy, 1949)
– Phallic guide with two lobes on each side in ventral view, tip pointed in lateral view; gonopods very small, not protruding at all. Inner surstylus longer, both with ventral projections. .... *Eudorylas amanii* **sp. n.**

14. Phallic guide broad, sides parallel, distal part with three pointed appendices at tip in ventral view; surstyli broad in the middle. SES with hairy ridges on both sides; gonopods with medial lobes (overlapping in ventral view), IG with a pointed tip. ..... *Eudorylas pilulus* **sp. n.**
– Phallic guide only broad at base in ventral view, narrowing towards pointed tip, with distinct hairs in the middle; surstyli narrow in the middle, pointed at tip; margins of SES distinct, with numerous hairs on both sides; gonopods almost symmetrical, rounded. ..... Eudorylas umbrinus (Loew, 1858)

15. Hind femora with thick ventral protuberance at base. ST8 without m.a., with a visible dorsal depression. Gonopods asymmetrical, both with medial projections; hypandrium very narrow; phallic guide triangle shaped and with two strong hairs on each side in ventral view, pointed at tip. .... *Eudorylas femoralis* **sp. n.**
– Hind femora without basal protuberance. 16

16. The male's eyes do not touch (they are close to each other for a distance equal to half the length of ocellar triangle). Phallic guide broad, sides parallel in ventral view, tip narrowing and curved in lateral view; phallus with teeth on the branches. ..... *Eudorylas ghesquierei* (Hardy, 1950)
– The eyes of the male always touch. 17

17. Abdominal tergites 3-5 shining. 18
– Abdominal tergites 3-5 pollinose. 23

18. Preabdominal tergites at least partly yellow. 19
– Preabdominal tergites without any yellow colour. 20

19. The whole body is generally yellow, only the fifth tergite and the last tarsi are dark. Thorax and abdomen covered with exceptionally dense, pale hairs. SES with hairs at base of SS; phallic guide straight and blunt in ventral view, bent towards SS and pointed at tip in lateral view; phallus coiled, without projection at branching point. ..... *Eudorylas angolae* **sp. n.**
– Tergites shining black, T3,4 with orange-brown ground colour. Surstyli with long hairs on ventral side; SES narrow, without hairs; phallic guide wide at tip with a membranous projection on the right in ventral view; phallus with a small projection at branching point. Hairs dispersed, short and white. ..... *Eudorylas rubrus* (Hardy, 1950)

20. Epandrium longer than wide, with a finger-like projection in ventral view. T1 and anterior half of T2 with stripes (pale brown), other parts shining black. Surstyli turned 90° ventrally; phallic guide short, rounded at tip. EP with a distinct yellow band in the middle. .... *Eudorylas encerus* (Hardy, 1949)
– Epandrium as wide as or wider than long, without ventral projection. 21

21. Gonopods asymmetrical; phallic guide with protuberance on the right side in ventral view covered with thick hairs, pointed at tip. Surstyli highly asymmetrical, with numerous hairs ventrally; phallus long, branches not separating from each other. Scutellum and abdominal tergites shining black; hairs dense, whitish, longest on T5. Lateral spines on first tergite as a patch of 8-10 long hairs. ..... *Eudorylas wittei* (Hardy, 1950)
– Gonopods symmetrical or missing; phallic guide without thick hairs. 22

22. Phallic guide broad on distal half, tip narrow; phallus short with thick branches. Abdominal tergites shining black (except T1, being greyish pollinose), sides with small grey patches. Cross-vein R-M at 1/2 of discal cell. ..... *Eudorylas scharffi* Földvári, 2003

– Phallic guide broad at base, narrowing towards tip in ventral view, flat and sharply pointed in lateral view; branches of the phallus thin and with a setulose membranous lobe. Abdominal tergites completely shining black, ST8 slightly pollinose. Cross-vein R-M at 1/4-1/3 of discal cell. .... *Eudorylas facetus* (Hardy, 1962)

23. At least one anteromedial hair present on hind tibiae. 24
– No anteromedial hair on hind tibiae. 34

24. No ventroapical spines on first femora. 25
– Ventroapical spines present on first femora. 28

25. Epandrium wider than long in dorsal view. 26
– Epandrium longer than wide in dorsal view. 27

26. A special bilobed structure present between the surstyli in dorsal view (Fig. 29B) connected to the phallic guide. S5 and S4 divided. Surstyli elongated, both C-shaped in lateral view; cerci asymmetrically placed, small; phallic guide with two apical lobes in ventral view. One erect anteromedial hair on 3rd tibia. ..... *Eudorylas amuscarium* (Hardy, 1959)
– No special structure between surstyli, cerci symmetrical. SES with thick hairs medially; phallic guide with parallel sides in ventral view, slightly pointed in lateral view. Eyes touching for distance equal to 4-5 times ocellar triangle. Three to four anteromedial hairs on 3rd tibia. .... *Eudorylas amitinus* (Hardy, 1962)

27. Gonopods highly asymmetrical, IG has a long process curved towards the median line (always with a flap-like structure at the base) and the PG is broad, S-shaped in lateral view. One pale anteromedial hair on 3rd tibia. ..... *Eudorylas skorpionensis* **sp. n.**
– Gonopods equal in length; phallic guide with two distal round lobes bent behind the central process in lateral view. Surstyli with hairs along ridges on ventral side; epandrium with special tooth-shaped form around cerci; SES with distinct hairs. One weakly developed anteromedial hair on 3rd tibia. ..... *Eudorylas lobus* **sp. n.**

28. Distinct hairs on SES. 29
– Hairs missing on SES. 31

29. Gonopods with hairy processes; phallic guide without elongated lateral projections, but with two flat lobes and a pointed tip in ventral view; at least one branch of phallus with teeth. One anteromedial hair on 3rd tibia. ..... *Eudorylas semiopacus* (Lamb, 1922)
– Gonopods without processes; phallic guide with elongated lateral projections. 30

30. Gonopods with 3-4 thick hairs close to tip, phallic guide with distinct lateral projection on the left in ventral view, tip pointed. Two branches of phallus and a membranous part with teeth. One or two strong anteromedial hairs on 3rd tibia. ..... *Eudorylas diversus* (Hardy, 1949)
– Gonopods with minute hairs along median edge; phallic guide with 3 additional branches laterally. Phallus with little teeth in lateral view. Surstyli with a row of hairs along a ridge at base. Two longer anteromedial hairs on 3rd tibia. ..... *Eudorylas inornatus* (Hardy, 1949)

31. Phallic guide with six appendices projecting to different directions; phallus with at least one branch bearing comb-like ornament. Gonopods equal in length, IG hairy at tip, OG with hairs along medial edge in a row. One erect anteromedial hair on 3rd tibia. .... *Eudorylas pectinatus* **sp. n.**
– Phallic guide with not more than two appendices. 32

32. Gonopods weakly developed; hypandrium deflected 45° in ventral view. Surstyli with distinct hairy projections at base. Phallic guide with two large lobes at tip in ventral view (almost as long as SS). One erect anteromedial hair on 3rd tibia. ..... *Eudorylas denotatus* (Hardy, 1959)
– Gonopods well developed; hypandrium not deflected. 33

33. Gonopods elongated, tips with hairy protuberances; phallic guide pointed at tip (hooked in lateral view), with two projections in ventral view. 2-3 erect anteromedial hairs on 3rd tibia. The m.a. round, pv directed, occupies 2/3 of width of ST8. Surstyli symmetric, rounded at tip; ST8 with large m.a.;; phallus short, trifid, two branches teethed. ..... *Eudorylas acroapex* (Hardy, 1962)
– Gonopods broad at tip, with small hairs along tips and median edge; phallic guide with two lateral lobes and a hook (in lateral view); phallus with teeth. One anteromedial hair on 3rd tibia. Hind trochanter with 2 black spines posterodorsally. ..... *Eudorylas garambensis* (Hardy, 1961)

34. Hind trochanter with a long projection; f3 thickened and bent, hind tibia bent in the middle. ST8 very large, without m.a.; phallic guide with a hook on the left in ventral view; ejaculatory apodeme parachute-shaped, with 3 lobes. ..... *Eudorylas flexus* (Hardy, 1949)
– Hind trochanter without any projection; other parts of the hind legs are not modified. 35

35. Third antennal segment obtuse. ST8 large, m.a. occupies all of ST8, except upper left angle in dorsal view. SES enlarged, with a wide lobe at the end; phallic guide long, with a groove along median line, tip elongated, pointed (in lateral view with two teeth towards SS, the lower with numerous hairs); phallus extremely long, coiled with supporting structure. .... *Eudorylas sinuosus* (Hardy, 1949)
– Third antennal segment at least acute (pointed). 36

36. No ventroapical spines on first femora. 37
– Ventroapical spines present on first femora. 43

37. Epandrium with a projection on the left side in ventral view (see Fig. 40H in lateral view). T6 with an S-shaped process dorsally. OS with a projection towards the other surstylus. .... *Eudorylas luteopilus* (Hardy, 1962)
– Epandrium without projection. 38

38. SES without hairs. 39
– SES covered with hairs. 40

39. Phallic guide straight in lateral view, branches of phallus short. Gonopods symmetrical, elongated, hairy along median edges; phallic guide broad, sides parallel, with three pointed tips in ventral view. .... *Eudorylas barracloughi* **sp. n.**
– Phallic guide hooked in lateral view, branches of phallus long, coiled. Gonopods asymmetrical, OG longer; phallic guide with membranous parts at the end covered by microtricha. .... *Eudorylas excisus* (Hardy, 1949)

40. Phallic guide with two lobes covered by thick hairs. SES with hairs behind PG; gonopods well sclerotized, round; hypandrium elongated, slightly turned. .... *Eudorylas pondolandi* Földvári, 2003
– Phallic guide without lobes or thick hairs. 41

41. Inner surstylus without basal projection in lateral view. Epandrium larger than ST8, broadest in the middle. Phallic guide broad at base and with two lobes surrounding PH. Wing with an extra spurious cross-vein closing the pterostigma at the end of the subcostal vein. .... *Eudorylas gabela* **sp. n.**
– Inner surstylus with a basal projection in ventral view. 42

42. Base of surstyli with ridges on each side covered by thick hairs. Phallic guide hairy, thick and strongly bent in ventral view, slightly curved towards SS in lateral view. .... *Eudorylas aculeatus* (Loew, 1858)
– Base of surstyli smooth, only thin hairs present. ST8 with a groove dorsally. Epandrium wider than long; phallic guide broad, tube-like. Cross-vein R-M just before middle of discal cell. .... *Eudorylas libratus* (Hardy, 1949)

43. No hairs on SES. 44
– Hairs present on SES. 46

44. Hypandrium deflected by 45° in ventral view. Gonopods equally long, OG with short hairs; phallic guide with long lateral hairs (6–7) in ventral view, PG curved towards SS in lateral view. .... *Eudorylas hirsutus* **sp. n.**
– Hypandrium straight. 45

45. Gonopods round, with minute hairs along median edges. Phallic guide with two lateral projections in ventral view and the tip of the PG forming a hook in lateral view. .... *Eudorylas brandbergensis* **sp. n.**
– Gonopods pointed, without hairs. Phallic guide with a hook on the right in ventral view. Vein Cu-M sharply bent (discal cell concave). ..... *Eudorylas unanimus* (Hardy, 1949)

46. Epandrium distinctly longer than wide. 47
– Epandrium distinctly shorter than wide. 49
– Epandrium about as long as wide. 51

47. Gonopods asymmetrical, OG shorter. Genitalia black, with golden-yellow pollinosity without dissection. Phallic guide with protuberances and numerous hairs, the round projection facing SS is covered by hairs as well. ..... *Eudorylas vicarius* (Hardy, 1949)
– Gonopods asymmetrical, OG longer and pointed at tip. 48

48. Phallic guide without projection in ventral view. Phallic guide thick, distally pointing towards SS, membranous lobes at tip; phallus as long as ST8+EP+SS. ..... *Eudorylas galeatus* (Hardy, 1949)
– Phallic guide with hook-like projection on the right in ventral view. ST8 with dorsal groove on the right side. ..... *Eudorylas mutillatus* (Loew, 1858)

49. Inner surstylus with basal projection in ventral view. Eyes touching for distance equal to 4.5-5 times ocellar triangle. Phallic guide broad in the middle, pointed at apex. .... *Eudorylas conformis* (Hardy, 1959)
– Inner surstylus without basal projection. 50

50. Gonopods asymmetrical, OG longer and hairy. ST8 almost divided by large m.a.; phallic guide pointed (also curved in lateral view) and hidden by band-like structure (not membranous); phallus with thick branches. ..... *Eudorylas natalensis* (Hardy, 1949)
– Gonopods symmetrical, without hairs. T5 3.5-4 times as long as ST8. Hypandrium with broadened lobes; phallic guide narrowing at tip, with hairs at base; phallus with very short branches distally and with membranous lobes along the whole PH. ..... *Eudorylas porrectus* (Hardy, 1949)

51. Gonopods symmetrical, rounded. Epandrium asymmetrical, cerci shifted to the right. Phallic guide sharply pointed. Phallus with supporting structure and a distinct, long process between PG and PH. ..... *Eudorylas meruensis* (Hardy, 1949)
– Gonopods subsymmetrical, both slightly pointed. Surstyli with lobes in lateral view; phallic guide pointed, with a distinct groove. ..... *Eudorylas mikenensis* (Hardy, 1950)

SUMMARY

Pipunculidae (big-headed flies) are the closest relative of the family Syrphidae (hover flies) and comprise about 1.300 species world-wide and 86 species in Hungary. They have very special life history, since the immatures are parasitoids of leafhoppers and planthoppers (Auchenorrhyncha).

The aim of our studies was to reveal species richness in Hungary, Europe and more widely in the Afrotropical Region. Taxonomic and faunistic goals were reached in terms of thorough descriptions, identification keys, species new to science, synonyms proposed and species lists for the different faunas investigated.

We revised all known species of the genus *Tomosvaryella* with West and Central European distribution. Two of the fourteen species were described as new to science (*Tomosvaryella magyarica* Földvári et De Meyer and *Tomosvaryella hortobagyiensis* Földvári et De Meyer) and an identification key to males and females was published. All taxa were provided with detailed description and drawings of genitalia of both sexes.

We proposed a new junior synonym to *Tomosvaryella minima* (namely *T. rondanii*) and designated lectotypes for *T. kuthyi* and *T. cilitarsis*.

The fauna of the Aggtelek National Park was studied which resulted in a list of 24 species living in the national park, 18 of which were new to the Hungarian fauna.

We added new morphological and faunistic data as a result of the revision of the whole Pipunculidae collection held in the Hungarian Natural History Museum (HNHM). One genus and 40 species were found new to the Hungarian fauna.

We published a critical list of Diptera species occurring in Hungary (Checklist of the Diptera of Hungary), where only those species were given whose records were reliable, based on literature and voucher specimen data. Altogether 58 out of the hitherto found 86 species have been reported for the first time following our studies on Hungarian Pipunculidae.

During the study of the fauna of the Canary Islands and Madeira we found 14 species, 13 of them from the Canary Islands and 3 for Madeira. Seven species are reported for the first time from the islands. *Tomosvaryella glabrum*, formerly considered a synonym of *T. subvirescens*, is re-instated as a separate species with *T. tecta* as a junior synonym. *Tomosvaryella ornatipes*, formerly considered a synonym of *T. frontata* is re-instated as a separate species.

As part of a survey on the dipterous fauna of Denmark the collection of the Zoological Museum, University of Copenhagen (ZMUC) was revised. This provided a list of 79 species of Pipunculidae expected to occur in Denmark, and reliable records exist for 62 of them.

The main purpose of the thesis was to revise the Afrotropical species of the tribe Eudorylini with special emphasis on new species, to clear the taxonomic status of the existing species, to solve nomenclatorial problems and to give an identification key to the males.

All four genera *(Claraeola, Clistoabdominalis, Dasydorylas, Eudorylas)* of the tribe existing in the Afrotropical Region and 78 species have been treated, 21 of them proved to be new to science.

Type material for all available species was studied and species were described in detail. Drawings of male and female genitalia were produced and an identification key to the males (only males were available in the majority of the species) is provided as well as diagnoses for easier species recognition.

New synonymies are proposed (in 9 cases) together with discussion on earlier methodology of species descriptions within this group, in particular that of D. E. Hardy's works.

ÖSSZEFOGLALÁS

A csupaszemlegyek (Pipunculidae) a zengőlegyek (Syrphidae) legközelebbi rokonai, eddig ismert fajaik száma mintegy 1.300 világszerte, valamint 86 Magyarországon.

Vizsgálataink célja ezen légycsalád fajainak kutatása Magyarországon, Európa egyes vidékein és az afrotrópikus régióban. Taxonómiai és faunisztikai eredményeket értünk el, melyeket egyes csoportok fajainak részletes leírása, határozó kulcsok elkészítése, a tudomány számára új fajok, javasolt új szinonimák és a vizsgált faunák fajlistáinak közlésével tettünk nyilvánossá.

A *Tomosvaryella* génusz összes közép- és nyugat-európai elterjedésű, eddig ismert faját revideáltuk. A tizennégy fajból kettőt a tudomány számára újként írtunk le (*Tomosvaryella magyarica* Földvári et De Meyer és *Tomosvaryella hortobagyiensis* Földvári et De Meyer) és közöltük a hímek és nőstények határzókulcsait. Minden fajt részletes leírással láttunk el és közöltük a fajok mindkét nemének ivarszerv rajzait.

Az Aggteleki Nemzeti Park faunájának vizsgálata során 24 fajt mutattunk ki, melyek közül 18 a magyar faunára új volt.

A Magyar Természettudományi Múzeum (HNHM) kárpát-medencei gyűjteményének revízióját követően új morfológiai és faunisztikai eredményeket közöltünk a hazai csupaszemlegyeket illetően. Egy génuszt és 40 fajt mutattunk ki Magyarország területéről elsőként.

Összeállítottuk a magyar csupaszemlegyek kritikai listáját a Checklist of the Diptera of Hungary című hiánypótló mű keretei között, ahol az irodalmi adatokkal és valós, gyűjteményben elhelyezett példányokkal (voucher specimen) bizonyított előfordulású fajokat soroltuk fel. A Pipunculidae család esetében 86 fajt listáztunk, melyből 58-at korábbi munkáink során mutattunk ki Magyarországról (ld. fent).

A Kanári-szigetek és Madeira faunájának kutatása során összesen 14 Pipunculidae fajt találtunk, melyből 13 a Kanári-szigeteken és 3 Madeirán fordult elő. Ezekről a szigetekről mi mutattunk ki 7 fajt első alkalommal. A *Tomosvaryella glabrum*-ot, melyet korábban a *T. subvirescens* szinonimájaként tekintettek, újra önálló fajnak ismertük el, és egyúttal javasoltuk a *T. tecta* nevet junior szinonimájának. A *Tomosvaryella ornatipes*-t ismét önálló fajnak ismertük el (korábban a *T. frontata* szinonimájának tekintették).

Dánia kétszárnyú faunája kutatásának részeként megvizsgáltuk a koppenhágai zoológiai múzeum Pipunculidae gyűjteményét. Ennek eredményeképpen 79 Dániában várható fajt listáztunk, melyek közül 62 esetében megbízható előfordulási adatokat (gyűjteményi példányok, közlemények) is találtunk.

Disszertációm legfőbb feladata az Eudorylini tribusba tartozó, afrotrópikus elterjedésű fajok taxonómiai revíziója volt, különös tekintettel az új fajokra, a meglévő fajok taxonómiai helyzetére, a nevezéktani problémák tisztázására és a fajok helyes felismerésére (határozókulcs a hímekre).

A tribus mind a négy afrotrópikus génuszát *(Claraeola, Clistoabdominalis, Dasydorylas, Eudorylas)* megvizsgáltuk, 78 fajról készítettünk pontos leírást, melyek közül 19 a tudomány számára új.

A fajok összes elérhető típusát (elsősorban holo- és szüntípusokat) megvizsgáltuk és részletes leírást készítettünk róluk. A hímek és nőstények ivarszervéről rajzokat készítettünk, valamint a hímekre határozókulcsot és az összes fajhoz diagnózist adtunk a könnyebb fajfelismerés érdekében.

Új szinonimákat javasoltunk 9 esetben és részleteztük a fajleírások korábbi módszertanát, különös tekintettel D. E. Hardy munkáira.

Acknowledgements

First of all I am very much indebted to László Papp, my supervisor, who showed me the interesting and challenging parts of dipterology and helped to find my way among the so many difficult groups of flies. His valuable comments and suggestions have always been helpful during my work and since he shared the experience he gathered during many years made it possible to finish this thesis.

I would like to thank Marc De Meyer for his patience and willingness to answer my never-ending list of questions on big-headed flies. I feel lucky because I met him, and had the opportunity to work with him from the very beginning. He was also kind enough to read through the thesis and make comments to the text which improved it to a great extent.

I would like to thank László Gallé and the Department of Ecology at the Szeged University that they made it possible for me to work in the Hungarian Natural History Museum, which is the most suitable place for taxonomic research due to traditionally conservative loan regulations of museums with insect collections.

Milan Kozánek help me when I started with Pipunculidae and took his time to show me the most important tricks and techniques how to work with big-headed flies. I am indebted to him because his unselfish patience.

I gratefully acknowledge the help of the Hungarian Natural History Museum which provided research facilities and made it possible to loan the important material of other museums.

I also would like to thank the various curators and institutions (listed in Materials and Methods); they helped me to obtain the specimens and added useful information on locality data.

Thanks to Jeff Skevington, Pavel Lauterer, Michael Ackland and Thomas Pape who provided numerous great ideas during earlier discussions on flies, more specifically on pipunculids.

Also I would like to thank my co-authors Marc De Meyer, Milan Kozánek, Martin Dempewolf, Rudolf Meier, Frederik Petersen and Marcos Báez who helped a lot during both the scientific work and during preparation of the manuscripts.

Róbert Bödőcs, Gábor M. Kovács and Miklós Péti read the manuscript partly or entirely and added useful comments, improved the English of the text; my sincere thank for their efforts.

I would like to thank my parents and my brother who helped me in many ways, and first of all they were patient enough towards my passion of working with flies.

Financial funding to my scientific work was provided by TEMPUS, Soros Foundation, Royal Central Africa Museum (Belgium), COBICE (Copenhagen), Colparsyst (Paris) and HighLat (Stockholm).

Literature cited

Albrecht, A. (1990): Revision, phylogeny and classification of the genus Dorylomorpha (Diptera, Pipunculidae). *Acta Zoologica Fennica* **188**: 1-240.

Ale-Rocha, R. (1996): Revision of South American species of Tomosvaryella Aczel (Diptera, Pipunculidae). *Revista Brasileira de Entomologia* **40**(2): 165-187.

Aczél, M. L. (1939): Das System der Familie Dorylaidae. Dorylaiden-Studien I. *Zoologischer Anzeiger* **125**: 15-23.

Aczél, M. L. (1940): Vorarbeiten zu einer Monographie der Dorylaiden (Dipt.). Dorylaiden-Studien V. *Zoologischer Anzeiger* **132**: 149-169.

Aczél, M. L. (1943): Sammelreferat der bionomisch-oekologischen Literatur über Dorylaiden ferner über die Morphologie der jüngeren Entwicklunkgsstadien (Ei, Larve, Puparium) (Dorylaiden-Studien 7). *Deutsche entomologische Zeitung* **1943**: 1-27.

Aczél, M. L. (1948): Grundlagen einer Monographie der Dorilaiden (Diptera). Dorilaiden-Studien VI. *Acta zoologica Lilloana* **6**: 5-168.

Bańkowska, R. (1972): Przeglad polskich gatunków z rodziny Pipunculidae (Diptera). *Fragmenta faunistica* **18**: 257-273.

Becker, T. (1898): Dipterologische Studien V. Pipunculidae. *Berliner entomologische Zeitschrift* **42**: 25-100.

Becker, T. (1900): Dipterologische Studien V. Pipunculidae. Erste Fortsetzung. *Berliner entomologische Zeitschrift* **45**: 215-252.

Becker, T. (1914): Diptères nouveaux récoltés par mm. Ch. Alluaud et R. Jeannel en Afrique Orientale. *Annales de la Société Entomologique de France* **83**: 120-130.

Becker, T. (1919): Diptères Brachycères. Mission du Service Geographique de l'Armée. *Mésure d'un Arc de Meridien Equatorial en Amérique du Sud, Paris* **10**: 163-216.

Becker, T. (1924): H. Sauter's Formosa–Ausbeute: Pipunculidae (Dorylaidae: Diptera). *Entomologische Mitteilungen* **13**: 14-18.

Bezzi, M. & Lamb, C. G. (1926): Diptera (excluding Nematocera) from the Island of Rodriguez. *Transactions of the Entomological Society of London* **58**(1925): 537-573.

Coe, R. L. (1966): Diptera Pipunculidae. *Handbooks for the Identification of British Insects* **10**(2c): 1-83.

Collin, J. E. (1956): Scandinavian Pipunculidae. *Opuscula Entomologica* **21**: 149-169.

Cresson, E. T. (1911): Studies in North American dipterology: Pipunculidae. *Transactions of the American Entomological Society* **36**: 267-329.

Curran, C. H. (1929): Nineteen new Diptera from Africa. *American Museum Novitates* **340**: 1-15.

Curran, C. H. (1936): The Templeton Crocker expedition to western Polynesian and Melanesian islands, 1933. No. 30 Diptera. *Proceedings of the California Academy of Sciences* **22**: 1-66.

De Meijere, J. C. H. (1917): Beiträge zur Kenntnis der Dipteren, Larven und Puppen. *Zoologisches Jahrbuch der Systematic* **40**: 117-322.

De Meyer, M. (1989*a*): The West-Palaearctic species of the pipunculid genera Cephalops and Beckerias (Diptera): classification, phylogeny and geographical distribution. *Journal of Natural History* **23**: 725-765.

De Meyer, M. (1989*b*): Systematics of the Nearctic species of the genus Cephalops Fallén (Diptera, Pipunculidae). *Bulletin de l'Institut Royal des Sciences Naturelles de Belgique, Entomologie* **59**: 99-130.

De Meyer, M. (1992): Revision of the Afrotropical species of Cephalops Fallén (Diptera, Pipunculidae). *Journal of African Zoology* **106**: 81-111.

De Meyer, M. (1993): A revision of the Afrotropical species of Tomosvaryella Aczél, 1939 (Diptera: Pipunculidae). *Annals of the Natal Museum* **34**: 43-101.

De Meyer, M. (1995*a*): Short note on fossil Pipunculidae (Diptera) from Dominican amber. *Journal of the New York Entomological Society* **103**(2): 208-214.

De Meyer, M. (1995*b*): The pipunculid flies of Israel and the Sinai (Insecta, Diptera, Pipunculidae). *Spixiana* **18**: 283-319.

De Meyer, M. (1996): World catalogue of Pipunculidae (Diptera). *Institut Royal des Sciences Naturelles de Belgique, Documents de Travail* **86**: 1-127.

De Meyer, M. and Skevington, J. [H.] (2001): Case 3132. Eudorylas Aczél, 1940 (Insecta, Diptera): proposed conservation of usage by the designation of Pipunculus fuscipes Zetterstedt, 1844 as the type species. *Bulletin of the zoological Nomenclature* **58**(1): 19-23.

De Meyer, M., Földvári, M. and Báez, M. (2000): The Pipunculidae (Diptera) fauna of the Canary Islands and Madeira. *Bulletin de la Société royale belge d'Entomologie* **136**(2000): 144-152.

Ferrar, P. (1987): *A guide to the breeding habits and immature stages of Diptera Cyclorrhapha*, vol. 1. and 2. Entomonograph 8. E. J. Brill, Leiden.

Földvári, M. (1999): The Pipunculidae (Diptera) fauna of the Aggtelek National Park, pp. 513-515. *In* Mahunka, S. (ed) *The Fauna of the Aggtelek National Park,* Hungarian Natural History Museum, Budapest.

Földvári, M. (2001): Pipunculidae, pp. 261-268. *In* Papp, L. (ed) *Checklist of the Diptera of Hungary*, Hungarian Natural History Museum, Budapest.

Földvári, M. (2003): New Afrotropical species from the tribe Eudorylini (Diptera: Pipunculidae). *Annales historico-naturales Musei nationalis hungarici* **95**: 161-171.

Földvári, M. (in press): Contributions to the taxonomy of Afrotropical Eudorylini (Diptera, Pipunculidae). *Folia entomologica hungarica* **64**: 00-00.

Földvári, M. and De Meyer, M (2000): Revision of Central and West European Tomosvaryella Aczél species (Diptera, Pipunculidae). *Acta Zoologica Academiae Scienctiarum Hungaricae* **45**(1999): 299-334.

Földvári, M. and Kozánek, M. (2001): New morphological and faunistic records of Hungarian Pipunculidae (Diptera). *Folia entomologica hungarica* **62**: 293-303.

Földvári, M., Dempewolf, M. and Petersen, F. T. (2001): Pipunculidae, pp. 211-212. *In* Petersen, F. T. & Meier, R. (eds) *A preliminary list of the Diptera of Denmark*. Steenstrupia 26(2): 119-276, Copenhagen.

Freytag, P. H. (1985): The insect parasites of leafhoppers, and related groups, pp. 423-467. *In* Nault, L. R. & Rodriguez, J. G. (eds): The leafhoppers and planthoppers, John Wiley & Sons, New York, USA.

Griffiths, G. C. D. (1972): *The phylogenetic classification of Diptera Cyclorrhapha with special reference to the structure of the male postabdomen*. Series Entomologica. vol. 8, Dr. W. Junk, N. V., The Hague.

Hardy, D. E. (1943): A revision of Nearctic (Dorilaidae) Pipunculidae. *Kansas University Science Bulletin* **29**: 1-231.

Hardy, D. E. (1949*a*): The African Dorilaidae (Pipunculidae-Diptera). *Mémoires de l'Institut Royal des Sciences Naturelles de Belgique* **36**: 1-80.

Hardy, D. E. (1949*b*): New Dorilaidae from the Belgian Congo. *Bulletin de l'Institut Royal des Sciences Naturelles de Belgique* **25**: 1-10.

Hardy, D. E. (1950): Dorilaidae (Pipunculidae) (Diptera). *Exploration Parc National Albert Mission G.F. de Witte* **62**: 3-53.

Hardy, D. E. (1952): Contribution a l'étude des diptères de l'Urundi III. Bibionidae et Dorilaidae. *Bulletin de l'Institut Royal des Sciences Naturelles de Belgique* **28**: 1-20.

Hardy, D. E. (1956): Insects of Micronesia Diptera: Dorilaidae (Pipunculidae). *Insects of Micronesia* **13**: 1-9.

Hardy, D. E. (1959*a*): Diptera (Brachycera): Dorilaidae-Pipunculidae. *South African Animal Life* **6**: 390-412.

Hardy, D. E. (1959*b*): Dorilaidae (Diptera Cyclorrhapha) Addendum. *Exploration Parc National Albert Mission G. F. de Witte* **95**: 27-29.

Hardy, D. E. (1961): Bibionidae (Diptera Nematocera) and Dorilaidae (Pipunculidae: Diptera-Cyclorrhapha). *Exploration du Parc National de la Garamba, Mission H. de Saeger* **24**: 111-180.

Hardy, D. E. (1962): Preliminary studies on the Pipunculidae of Madagascar (Diptera). *Verhandlungen der Naturforschenden Gesellschaft in Basel* **73**: 241-269.

Hardy, D. E. (1965): Family Pipunculidae, pp. 550-557. *In* Stone, A. Sabrosky, C. W., Wirth, W. W., Foote, R. H. & Coulson, J. R. (eds) *A Catalog of the Diptera of America North of Mexico*, U.S. Department of Agriculture, Agricultural Handbook, Washington.

Hardy, D. E. (1966*a*): 45 Family Pipunculidae (Dorilaidae), pp. 45.1-45.15. *In* Papavero, N. (ed) *A catalogue of the Diptera of the Americas south of the United States*, São Paulo.

Hardy, D. E. (1966*b*): Diptera from Nepal, Pipunculidae (Dorilaidae). *Bulletin of the British Museum (Natural History), Entomology* **17**: 439-449.

Hardy, D. E. (1968): Bibionidae and Pipunculidae of the Philippines and Bismarck Islands (Diptera). *Entomologiske Meddelelser* **36**: 417-507.

Hardy, D. E. (1971): Pipunculidae (Diptera) parasitic on rice leafhoppers in the Oriental Region. *Proceedings of the Hawaiian entomological Society* **21**(1): 79-91.

Hardy, D. E. (1972): Pipunculidae (Diptera) Parasitic on Rice Leafhoppers in the Oriental Region. *Proceedings of the Hawaiian Entomological Society* **21**: 79-91.

Hardy, D. E. (1975): Family Pipunculidae, pp. 296-306. *In* Delfinado, M. D. & Hardy, D. E. (eds) *A catalogue of Diptera of the Oriental Region*, vol. 2. University Press of Hawaii, Honolulu.

Hardy, D. E. (1980): 37. Family Pipunculidae, pp. 483-487. *In* Crosskey, R. W. (ed) *Catalogue of the Diptera of the Afrotropical Region*. British Museum (Natural History), London.

Hardy, D. E. (1989): 50. Family Pipunculidae, pp. 433-436. *In* Evenhuis, N. L. (ed) *Catalog of the Diptera of the Australasian and Oceanian Regions*. Bishop Museum Press, Honolulu.

Hennig, W. (1952): *Die Larvenformen der Dipteren*, vol. 3. Akademie-Verlag, Berlin.

Hennig, W. (1973): Ordnung Diptera (Zweiflügler), pp. 1-337. *In* Helmke, J. G. (ed) *Handbuch der Zoologie* 4(2), De Gruyter, W., Berlin.

International Commission on Zoological Nomenclature (1963): Opinion 678. The suppression under the plenary powers of the pamphlet published by Meigen, 1800. *Bulletin of the zoological Nomenclature* **29**: 339-342.

International Commission on Zoological Nomenclature (1999): *International Code of Zoological Nomenclature*. International Trust for Zoological Nomenclature, London.

International Commission on Zoological Nomenclature (2002): Opinion 2000 (Case 3132) Eudorylas Aczél, 1940 and Microcephalops De Meyer, 1989 (Insecta, Diptera): conserved by the designation of Pipunculus fuscipes Zetterstedt, 1844 as the type species of Eudorylas. *Bulletin of the zoological Nomenclature* **59**(2): 143-144.

Jervis, M. A. (1980): Studies on oviposition behaviour and larval development in species of Chalarus (Diptera, Pipunculidae) parasites of typhlocybine leafhoppers (Homoptera, Cicadellidae). *Journal of Natural History* **14**: 759-768.

Kapoor, V. C., Agarwal, M. L. and Grewal, J. S. (1977): Two new species of Pipunculidae (Diptera: Pipunculidae) from Ranikhet, Kumaon hills, India. *Bulletin of Entomology* **18**: 74-77.

Kapoor, V. C., Grewal, J. S. and Sharma, S. K. (1987): *Indian pipunculids (Diptera: Pipunculidae). A Comprehensive Monograph*. Atlantic Publishers, New Dehli.

Keilin, D. and Thompson, W. (1915): Sur le cycle evolutif des Pipunculides (Diptères), parasites intracoelomiques des Typhlocybes (Homoptères). *Comptes Rendus de la Société Biologique* **67**: 9-12.

Kertész, K. (1907): Vier neue Pipunculus-Arten. *Annales historico-naturales Musei nationalis hungarici* **5**: 579-583.

Kertész, K. (1910): *Catalogus Dipterorum hucusque descriptorum*, vol. 7. Museum Nationale Hungaricum, Budapest.

Koizumi, K. (1959): On four Dorilaid parasites of the green rice leafhopper, Nephotettix cincticeps Uhler. (Diptera). *Scientific report of the Faculty of Agriculture, Okayama University* **13**: 37-45.

Kozánek, M., Albrecht. A. and De Meyer, M. (1998): Pipunculidae, pp. 141-150. *In* Papp, L. & Darvas, B. (eds) *Contributions to a Manual of Palaearctic Diptera*, vol. 1. Science Herald, Budapest.

Lamb, C. G. (1922): The Percy Sladen Trust expedition to the Indian Ocean in 1905, under leadership of Mr. J. Stanley Gardiner M. A. Vol. 7. No. VIII. – Diptera: Asilidae, Scenopinidae, Dolichopodidae, Pipunculidae, Syrphida. *Transactions of the Linnean Society of London (Second Series, Zoology)* **18**: 361-416.

Kozánek, M. and Lauterer, P. (1987): Pipunculidae. *Acta Faunistica Entomologica Musei Nationalis Pragae* **18**: 161-164.

Lindberg, H. (1946): Die Biologie von Pipunculus chlorionae Frey und Einwirkung von dessen Parasitismus auf Chloriona-arten. *Acta Zoologica Fennica* **45**: 1-50.

Lindner, E. (1956): Ostafrikanische Dorylaidae und Clythiidae (Dipt.). *Jahresheft des Vereins für Vaterländische Naturkunde in Württemberg* **111**: 50-51.

Loew, H. (1858): Bidrag till kännedomen om Afrikas Diptera [part]. *Öfversigt af Kongelige Vetenskaps-Akademiens Förhandlingar Stockholm* **14**(1857): 337-383.

Loew, H. (1860): Die Dipteren-Fauna Südafrika's. Erste Abtheilung. *Abhandlungen der naturwissenschaftlichen Vereins von Sachsen und Thüringen in Halle* **2**: 57-402.

Matsumura, S. (1915): *Insect Taxonomy*. Volume 2: 30 [in Japanese].

Matsumura, S. (1916): Thousands insects of Japan, pp. 185-474. *In* Additamenta 2 (Diptera), Tokyo [in Japanese and English].

May, Y. Y. (1979): The biology of Cephalops curtifrons (Diptera: Pipunculidae) an endoparasite of Stenocranus minutus (Hemiptera: Heteroptera) Delphacidae. *Zoological Journal of the Linnean Society* **66**: 15-29.

Merz, B. and Haenni, J.-P. (2000): Morphology and terminology of adult Diptera (other than terminalia), pp. 21-51. *In* Papp, L. & Darvas, B. (eds) *Contributions to a Manual of Palaearctic Diptera*, vol.1. Science Herald, Budapest.

Morakote, R. & Hirashima, Y. (1990*a*): A Systematic Study of the Japanese Pipunculidae (Diptera) Part I. Introduction to the Family and the Genus Verrallia Mik. *Journal of the Faculty of Agriculture, Kyushu University* **34**: 123-159.

Morakote, R. and Hirashima, Y. (1990*b*): A Systematic Study of the Japanese Pipunculidae (Diptera) Part II. The Genus Chalarus Walker. *Journal of the Faculty of Agriculture, Kyushu University* **34**: 161-181.

Morakote, R. and Hirashima, Y. (1990*c*): A Systematic Study of the Japanese Pipunculidae (Diptera) Part III. The Genus Cephalops Fallén. *Journal of the Faculty of Agriculture, Kyushu University* **34**: 183-214.

Morakote, R. and Hirashima, Y. (1990*d*): A Systematic Study of the Japanese Pipunculidae (Diptera) Part IV. The Genus Pipunculus Latreille. *Journal of the Faculty of Agriculture, Kyushu University* **34**: 215-239.

Morakote, R. and Yano, K. (1987): Morphology of immature stages of some Japanese Pipunculidae (Diptera) parasitizing Nephotettix cincticeps (Hemiptera, Deltocephalidae). *Kontyu, Tokyo* **55**(2): 176-186.

Morakote, R. and Yano, K. (1988): Biology of some Japanese Pipunculidae (Diptera) parasitizing Nephotettix cincticeps (Hemiptera, Deltocephalidae). *Bulletin of the Faculty of Agriculture Yamaguchi University* **35**: 9-22.

Parker, H. L. (1967): Notes on the biology of Tomosvaryella frontata (Diptera: Pipunculidae), a parasite of the leafhopper Opsius stactogalus on Tamarix. *Annals of the Entomological Society of America* **60**(2): 292-295.

Rafael, J. A. (1986): Amazunculus, a new genus of pipunculid from the Amazon basin (Diptera, Pipunculidae). *Amazoniana* **10**: 15-19.

Rafael, J. A. (1988): Pipunculidae (Diptera) neotropicais do gênero Elmohardyia Rafael. *Acta Amazonica* **18**: 223-264.

Rafael, J. A. (1993): Espécies de Eudorylas Aczél (Diptera, Pipunculidae) do México e América central. *Revista Brasileira de Entomologia* **37**: 751-762.

Rafael, J. A. (1995): Espécies de Eudorylas Aczél (Diptera, Pipunculidae) da América do Sul. *Revista Brasileira de Entomologia* **39**: 793-838.

Rafael, J. A. (1996): Pipunculidae (Insecta: Diptera) of the Dominican Republic: New records and description of new species. *Annals of Carnegie Museum* **65**(4): 363-381.

Rafael, J. A. and Ale-Rocha, R. (1997): Chilean Pipunculidae (Diptera). Key to genera, new records, description of a new species of Eudorylas Aczél and a catalog of species. *Revista Chilena de Entomologia* **24**: 31-36.

Rafael, J. A. and da S. Menezes, M. D. (1999): Taxonomic review of Costa Rican Pipunculidae (Insecta: Diptera). *Revista de Biologia Tropical* **47**(3): 513-534.

Rapp, W. F. (1946): Zoological results of the George Vanderbilt african expedition of 1934. Part XI. – A new Pipunculus from Africa (Pipunculidae, Diptera). *Notulae Naturae* **178**: 1-2.

Rothschild, G. H. L. (1964): The biology of Pipunculus semifumosus (Kowarz) (Diptera: Pipunculidae), a parasite of Delphacidae (Homoptera), with observations on the effects of parasitism on the host. *Parasitology* **54**: 763-769.

Sack, P. (1935): 32. Dorylaidae (Pipunculidae), pp. 1-57. *In* Lindner, E. (ed) *Die Fliegen der Palaearktischen Region*, vol. 4(4). Schweizerbart'sche Verlag, Stuttgart.

Sander, F. W. (1985): Enemies of cicadas in grassland ecosystems of East Germany (Pipunculidae, Diptera) remarks on development behavior and host-parasite relationships. *Wissenschaftliche Zeitschrift der Friedrich-Schiller-Universität Jena, Naturwissenschaftliche Reihe* **34**(4): 609-624.

Séguy, E. (1946): Mission de M. Risbec en Afrique occidentale. *Encyclopedie Entomologique Série B II Diptera* **10**: 9-14.

Sinclair, B. J. (2000): Morphology and terminology of Diptera male genitalia, pp. 53-74. *In* Papp, L. & Darvas, B. (eds) *Contributions to a Manual of Palaearctic Diptera*, vol.1. Science Herald, Budapest.

Skevington, J. H. (1999): Cephalosphaera Enderlein, a genus of Pipunculidae (Diptera) new for Australia, with descriptions of four new species. *Australian Journal of Entomology* **38**: 247-256.

Skevington, J. H. (2001): Revision of Australian Clistoabdominalis (Diptera: Pipunculidae). *Invertebrate Taxonomy* **15**: 695-761.

Skevington, J. H. (2002): Phylogenetic revision of Australian members of the Allomethus genus group (Diptera: Pipunculidae). *Journal of Insect Systematics and Evolution* **33**: 133-161.

Skevington, J. H. (2003): Revision of Australian Eudorylas Aczél (Diptera: Pipunculidae). *Studia dipterologica* **9**(2)(2002): 621-672.

Skevington, J. H. and De Meyer, M. (in prep.): Pipunculidae research by Elmo Hardy: another founding event on the Hawaiian Islands.

Skevington, J. [H.] and Marshall, S. A. (1997): First record of a big-headed fly, Eudorylas alternatus (Cresson) (Diptera: Pipunculidae), reared from the subfamily Cicadellinae (Homoptera: Cicadellidae), with as overview of pipunculid-host associations in the Nearctic Region. *The Canadian Entomologist* **129**: 387-398.

Skevington, J. [H.] and Marshall, S. A. (1998): *Systematics of New World Pipunculus (Diptera: Pipunculidae)*. Thomas Say Publications in Entomology. Monographs, Entomological Society of America, Lanham, Maryland.

Skevington, J. H. and Yeates, D. K. (2001): Phylogenetic classification of Eudorylini (Diptera: Pipunculidae). *Systematic Entomology* **26**: 421-452.

Strübing, H. (1957): Ein Beitrag zur Biologie parasitischer Fliegen (Diptera–Pipunculidae). *Naturwissenschaften* **10**: 1-2.

Tanasijtshuk, V. N. (1988): Family Pipunculidae, pp. 230-245. *In* Soós, A. & Papp, L. (eds) *Catalogue of Palaearctic Diptera*, vol. 8. Akadémiai Kiadó, Budapest.

Verrall, G. H. (1901): Platypezidae, Pipunculidae, and Syrphidae of Great Britain. *British Flies* **8**: 1-691.

Walloff, N. and Jervis, M. A. (1987): Communities of parasitoids associated with leafhoppers and planthoppers in Europe. *Advances in ecological research* **17**: 281-402.

Whittaker (1969): The biology of Pipunculidae, (Diptera) parasitising some British Cercopidae (Homoptera). *Proceedings of the Royal Entomological Society of London, Series A, General Entomology* **44**(1-3): 17-24.

Yano, K. (1979): Faunal and biological studies on the insects of paddy fields in Asia. Part II. Illustrated key to the Thai species Pipunculidae (Diptera). *Esakia* **13**: 45-54.

Yano, K., Ishitani, M., Asai, I. and Satoh, M. (1984): Faunal and biological studies on the insects of paddy fields in Asia. XIII. Pipunculidae from Japan (Diptera). *Transactions of the Shikoku Entomological Society* **16**(4): 3-74.

Yano, K., Morakote, R., Satoh, M. and Asai, I. (1985): An evidence for behavioral change in Nephotettix cincticeps Uhler (Hemiptera: Deltocephalidae) parasitized by pipunculid flies (Diptera: Pipunculidae). *Applied Entomology and Zoology* **20**(1): 94-96.