

Introduction

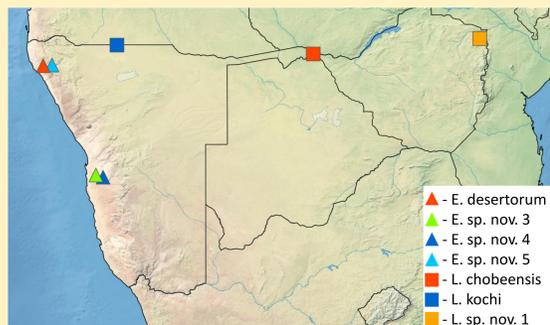
Mydidae is a relatively small family, composed of only 478 species, within the order Diptera. Mydidae are most common in the Afrotropical Region, particularly in southern Africa. They are poorly studied due to their infrequency and their short annual activity periods, often only being active for a few weeks each year¹. The goal of this taxonomic revision is to re-describe existing species and describe new species from the genera *Eremohaplomydas* and *Lachnocorynus*.



Eremohaplomydas and *Lachnocorynus* were both originally described from a very small number of specimens. Since their description, new specimens have been collected and discovered in museum collections. *Eremohaplomydas* is endemic to the Namib desert, an area 100 km wide on the west coast of Namibia.

Two of the new species described here were collected near the Gobabeb field station in the central Namib desert. With the addition of these new species, there have now been 11 Mydidae species recorded at Gobabeb and the surrounding area, making it one of the most speciose areas for mydas flies, especially considering it's desert environment.

Eremohaplomydas nov. sp. 4 was collected by Robert Wharton in 1979 at the Gobabeb field station and has not been collected since¹. *Eremohaplomydas* nov. sp. 3 was collected for the first time 20 km north of the station by Torsten Dikow in 2018.



Materials and Methods

The 22 specimens used in this revision came from MZLU - Lund University, Lund, Sweden; NMNW - National Museum of Namibia, Windhoek, Namibia; NMSA - KwaZulu-Natal Museum, Pietermaritzburg, South Africa; SANC - South African National Collection of Insects, Pretoria, South Africa; USNM - National Museum of Natural History, Washington, D.C., USA; and ZSMC - Zoologische Staatssammlung, München, Germany.

The specimens were described using a Lucid Builder character matrix with 164 features. These descriptions were exported using natural language processing. Specimens were examined using a Leica MZ6 microscope and an Olympus SZ60 microscope. Whole habitus photographs were taken using GIGAmacro Magnify² imaging system, a Canon D-7 fullframe DSLR, a Canon MP-E 65 mm f2.8 macro-lens, and illuminated by a twin-flash. Raw images were stacked using HeliconFocus Pro V6.7. Species occurrence data were plotted in SimpleMapp and FileMaker Pro 15 was used to database specimen metadata.

Currently Known Species

- described by Bequaert in 1959
- proboscis extremely short
- R4 and R5 independently terminating in R1
- alula entirely reduced
- thorax pubescence dark brown



- described by Hesse in 1969
- parafacial area as wide as facial gibbosity
- white coloration on posterior margin of tergites 2–6
- postpedicel 2–3x as long as scape and pedicel



- described by Hesse in 1969
- parafacial area as wide as facial gibbosity
- white coloration on posterior margin of tergites 1–7
- postpedicel 5x as long as scape and pedicel



New Lachnocorynus Species



- parafacial area about half as wide as facial gibbosity
- vertex between eyes depressed
- r-m crossvein present

New Eremohaplomydas Species



- proboscis very short
- M3 wing vein absent from M to Cu
- thick yellow pubescence on entire scutum
- cell r4 closed with R4 and R5 terminating together in R1
- alula well-developed



- proboscis extremely short
- thorax pubescence light brown
- cell r4 closed with R4 and R5 independently terminating in R1
- alula entirely reduced



- proboscis very short
- grey pubescence patterned on scutum
- cell r4 closed with R4 and R5 terminating together in R1
- alula well-developed

Differentiation of the Genera

Eremohaplomydas

- proboscis very short
- C terminating at R1
- frons between antennal base and anterior ocellus pubescent
- vertex width equal to ventral eye margin, eyes parallel-sided or almost so

Lachnocorynus

- proboscis short, nob-like
- C terminating at M1
- frons between antennal base and anterior ocellus apubescent
- vertex width larger than ventral eye margin, eyes do not appear parallel-sided

Discussion

An interesting observation emerged from the *Eremohaplomydas* species. *E. sp. nov. 3* and *E. sp. nov. 5* share morphological traits as do *E. desertorum* and *E. sp. nov. 4*. These similarities are especially present in their mouth parts. All four species have very short proboscises, but *E. desertorum* and *E. sp. nov. 4* have an extremely short barely visible proboscis and *E. sp. nov. 3* and *E. sp. nov. 4* have a very short but visible proboscis. Both of these pairs of species have one species from the northern Namib (*E. desertorum* and *E. sp. nov. 5*) and one species from the Gobabeb locality (*E. sp. nov. 3* and *E. sp. nov. 4*).

species	# specimens	# collecting events	earliest collection	most recent collection
<i>E. desertorum</i>	3	2	1951	1951
<i>E. sp. nov. 3</i>	7	3	2018	2018
<i>E. sp. nov. 4</i>	7	3	1979	1979
<i>E. sp. nov. 5</i>	1	1	1970	1970
<i>L. chobeensis</i>	2	1	1930	1930
<i>L. kochi</i>	1	1	1948	1948
<i>L. sp. nov. 1</i>	1	1	1986	1986
summary	22	12	1930	2018

species	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
<i>E. desertorum</i>	-	-	-	-	-	-	-	-	-	-	-	3/2
<i>E. sp. nov. 3</i>	-	-	-	-	7/3	-	-	-	-	-	-	-
<i>E. sp. nov. 4</i>	-	-	-	-	-	-	-	-	-	-	7/2	-
<i>E. sp. nov. 5</i>	-	-	-	-	-	-	-	-	-	-	1/1	-
<i>L. chobeensis</i>	2/1	-	-	-	-	-	-	-	-	-	-	-
<i>L. kochi</i>	1/1	-	-	-	-	-	-	-	-	-	-	-
<i>L. sp. nov. 1</i>	-	1/1	-	-	-	-	-	-	-	-	-	-
total	3/2	1/1	-	-	7/3	-	-	-	-	-	8/3	3/2

Throughout the description process, *E. sp. nov. 4* and *E. desertorum* shared many morphological traits. However they were collected approximately 635 km apart and are active at different times of the year, with *E. sp. nov. 4* being active in May and *E. desertorum* being active in June.

L. kochi and *L. chobeensis* are also very morphologically similar, but they were collected approximately 963 km apart. They were both collected in July, removing seasonal activity as a potential distinguishing characteristic.

Acknowledgments and References

We would like to thank the museum curators from institutions around the world for making specimens in their care available through loans. Specimens for this project were collected during field-work funded by an NMNH ADS Core Grant to T. Dikow in 2016. We would like to acknowledge the National Science Foundation as well as the Natural History Research Experience program for making this research possible. This work was supported by NSF grant OCE-1560088. Special thanks to Gene Hunt and Virginia Power for their constant support during the NHRE program.



REU Site, OCE-1590088

¹Wharton, Robert A. "Observations on the Behavior, Phenology and Habitat Preferences of Mydas Flies in the Central Namib Desert (Diptera: Mydidae)." *Annals of the Transvaal Museum*, vol. 33, no. 9, Mar. 1982.