

An annotated checklist of the endemic Carabidae (Coleoptera) of Egypt

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ABSTRACT: Endemic species are usually not very widespread in their distribution, but are only found in a particular region and nowhere else in the world. Because of this, they are of great conservation concern. A checklist of the endemic carabid beetles of Egypt was compiled and updated from published and unpublished records including long-term surveys. As far as can be ascertained, there are 39 valid carabid species and subspecies from 28 genera that are endemic to Egypt including Sinai. These represent about 16.3% of the total carabid fauna recorded from the country, and belong to five subfamilies: Brachininae, Cicindelinae, Harpalinae, Scaritinae, and Trechinae. I provide notes about type localities, depositories and distribution.

INTRODUCTION

More than ever before, endangered and endemic species are used by conservationists to set priorities for establishing protected areas (Brooks *et al.* 2006). Species checklists are helpful tools in the fields of natural science. They serve to consolidate our level of knowledge and at the same time reveal areas in need of further investigation.

In the first half of the twentieth century, Schatzmayr (1936) published the first information about the species composition of carabid beetles of Egypt, while Alfieri (1976) published the latest comprehensive list of most families of Egyptian beetles, including Carabidae. Alfieri summarized what was known about distribution in his fundamental faunistic work. The catalogues of several families have been updated and revised since then, but the lack of a complete and readily accessible list is a major difficulty when this type of information is needed, in particular in systematic, biogeographical or ecological studies. In the last thirty years, new data on taxonomy have been supplemented with information on species distributions (Abdel-Dayem 1998; 2009; Abdel-Dayem *et al.* 2003) and faunal composition of various areas in Egypt with differing bioregions (El-Moursy *et al.* 2001; Semida *et al.* 2001; El-Gharbawy and Salem 2003; Abdel-Dayem 2004).

The aim of this study is to compile an annotated list of the endemic carabid species known from Egypt, integrating all published sources, records in Egyptian Insect Reference Collections and long-term field surveys. In addition, it aims to provide a status quo and to track changes from the last comprehensive lists (Schatzmayr 1936; Alfieri 1976).

MATERIALS AND METHODS

Data Sources

This checklist is mostly based on available literature and specimens rather than on extensive new taxonomic work. The data on endemic carabid species have been combined from published data from a variety of different sources,

a detailed examination of all the specimens preserved in Egyptian Insect Reference Collections (EIRCs), and long-term field surveys carried out by the author between 1991 and 2009. The collected specimens from these surveys have been identified and deposited in the insect reference collection of the Entomology Department, Faculty of Science, Cairo University, Giza, Egypt (CUC).

Taxonomic Considerations

The checklist includes all endemic species of carabid beetles known to occur or to have occurred within the political boundaries of Egypt. Endemic species are indigenous (precinctive) species based on their current taxonomic status in Egypt and known from no other area.

Arrangement

The list is arranged systematically to genus level and alphabetically thereafter. The classification and nomenclature of endemic carabid beetles follow Löbl and Smetana (2003). For the species, the most recent combination followed by the author name, year and page number (s) of original citation are given. The type locality (followed by Governorate and bioregion between parentheses) and the type depository, from collections, original description or publications, are given after the name, where available; a question mark notes cases which are doubtful. In some cases (especially when the available data are only taken from the original description), specific type localities are not known and thus bioregion or just 'Egypt' is given.

Each species has been attributed to one or more of the seven bioregions of Egypt (Figure 1) based on the literature (Alfieri 1976; Abdel-Dayem 1998; 2009; Abdel-Dayem *et al.* 2003) and unpublished field data. After each bioregion, each species has also been provided with a list of localities in Egypt from which it has been recorded. The localities are arranged alphabetically and mainly based on literature and data labels of specimens actually examined

by the author.

Revision Procedures

Species have been declared to be in the checklist only based on one or more voucher specimens in EIRCs or a reliable published record. The initial step was a compiled list of all the species recognized in Csiki (1928), Schatzmayr and Koch (1933, 1934), Schatzmayr (1936), Alfieri (1976), Löbl and Smetana (2003), and Abdel-Dayem (1998, 2009). This preliminary list was evaluated and documented by checking it, species by species, aligned with the specimens preserved in EIRCs. Additionally, the list was supplemented and refined by consulting the major reference works and selected other publications, as suitable. The annotations in the checklist are based on all of these sources.

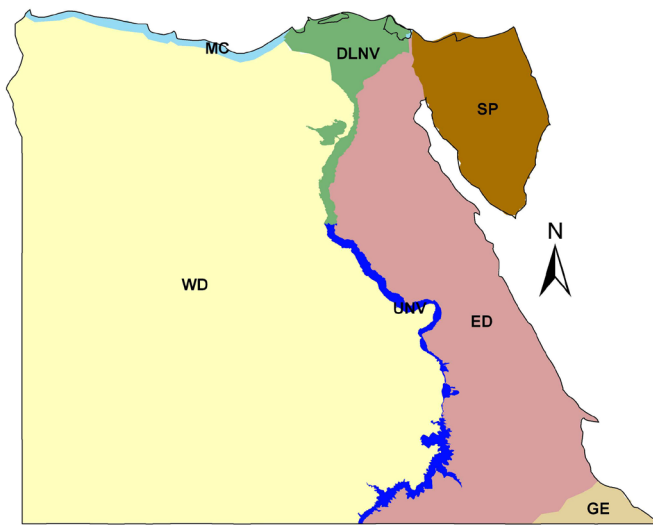


FIGURE 1. Map of bioregions in Egypt. Legend: DLNV, Delta and Lower Nile Valley; ED, Eastern Desert; GE, Gebel Elba; MC, Mediterranean Coast; SP, Sinai Peninsula; UNV, Upper Nile Valley; WD, Western Desert.

Acronyms of depositories

ALFC – Alfieri Collection, Plant Protection Department, Faculty of Agriculture, Al Azhar University, Cairo, Egypt.

BNHMF – Basel Natural History Museum, G. Frey Collection, Switzerland.

CUC – Cairo University Collection, Entomology Department, Faculty of Science, Cairo University, Giza, Egypt.

HNHM – Hungarian National History Museum, Budapest, Hungary.

MAC – Ministry of Agriculture Collection, Insect Classification and Surveying, Plant Protection Research Institute, Agricultural Research Center, Dokki, Giza, Egypt.

MCNM – Natural History Museum of Milan, Italy.

MHNB – Museum of Natural History, Humboldt University, Berlin, Germany.

MNHN – Museum National d’Histoire Naturelle, Paris, France.

SMNH – Swedish Museum of Natural History, Stockholm, Sweden.

USNM – National Museum of Natural History, Smithsonian Institution, Washington, D.C, USA.

ZMMU – Zoological Museum of Moscow Lomonosov University, Moscow, Russia.

Abbreviations used for bioregion in Egypt

DLNV, Delta and Lower Nile Valley; ED, Eastern Desert; GE, Gebel Elba; MC, Mediterranean Coast; SP, Sinai Peninsula; UNV, Upper Nile Valley; WD, Western Desert.

RESULTS AND DISCUSSION

At present, there are 39 species of endemic carabid beetles known from Egypt, comprising 28 genera in five subfamilies, and representing 16.3% of the total carabid fauna in Egypt. This high endemic percentage is due mainly to the Harpalinae (8.3%; 20 species in 17 genera), Trechinae (4.6%; 11 species in 7 genera), Scaritinae (2.1%, five species in two genera), Brachininae (0.8%, two species in one genus), and Cicindelinae (0.4%, one species in one genus). The most numerous genus is *Cilvina* (4), while *Tachyura* has three species, and *Brachinus*, *Chlaenius*, *Microlestes* and *Porotachys* include two species each. The remaining genera have only one endemic species.

The Checklist

Subfamily: Cicindelinae Latreille, 1802

Tribe: Cicindelini Latreille, 1802

Subtribe: Cicindelina Latreille, 1802

Genus: *Cephalota* Dokhtoureff, 1883

1. *Cephalota (Taenidia) tibialis tibialis* (Dejean, 1822)

Cicindela tibialis Dejean, 1822: 55

Type locality: Port Said (Port Said, MC)

Type depository: MNHN

Distribution: MC: Burg El-Arab, Dekhiela, Matrouh, Port Said, Ras El-Bar. SP: Zaranik.

Subfamily: Brachininae Bonelli, 1810

Tribe: Brachinini Bonelli, 1810

Genus: *Brachinus* Weber, 1801

2. *Brachinus latipennis* Peyerimhoff, 1907: 8

Type locality: Sinai (Southern Sinai, SP)

Type depository: MNHN

Distribution: SP: El-Hessua Oasis, Gebel Mussa, Karm Alam, Wadi Feiran, Wadi Gena, Wadi Hebran, Wadi Isla. WD: Dakhla Oasis.

3. *Brachinus (Cnecostolus) pseudocruciatu*s Reitter, 1909: 30

Type locality: Alexandria (Alexandria, MC)

Type depository: HNHM

Distribution: DLNV: Cairo. MC: Alexandria.

Subfamily: Scaritinae Bonelli, 1810

Tribe: Clivinini Rafinesue, 1815

Subtribe: Clivinina Rafinesue, 1815

Genus: *Clivina* Latreille, 1802

4. *Clivina goniostoma* Putzeys, 1866: 128

Type locality: Egypt

Type depository: MNHN

Distribution: no record other than the type specimen (Schatzmayr, 1936)

5. *Clivina kochi* Schatzmayr, 1936: 30

Type locality: Kirdasa (Giza, DLNV)

Type depository: MCNM

Distribution: DLNV: Beni Youssef, Cairo, El Wasta, Giza, Kafr Hakim, Kirdasa, Mansouriyia, Mataria, Pyramids, Talbiya, Sakkara. UNV: Assuit.

6. *Clivina nitida* Mjöberg, 1905: 3

Type locality: Aswan (Aswan, UNV)

Type depository: SMNH

- Distribution: Aswan is the only known locality for this species.
7. *Clivina tutancamon* Schatzmayr, 1936: 30
 Type locality: Barrage (Qalubia, DLNV)
 Type depository: MCNM
 Distribution: DLNV: Barrage, Maadi, Shirbin.
Tribe: Dyschiriini W. Kolbe, 1880
Genus: Dyschirius Bonelli, 1810
 8. *Dyschirius (Dyschiriodes) aida* Schatzmayr, 1936: 34, 37
 Type locality: Ismailia (Ismailia, ED)
 Type depository: MCNM
 Distribution: known only from the type locality.
Subfamily: Trechinae Bonelli, 1810
Tribe: Bembidiini Stephens, 1827
Subtribe: Bembidiina Stephens, 1827
Genus: Bembidion Latreille, 1802
 9. *Bembidion (Microserrullula) aegyptiacum* Dejean, 1831: 90
 Type locality: Egypt
 Type depository: MNHN
 Distribution: DLNV: Barrage, Cairo, Helwan, Kafr Shukur, Katta, Marg, Mataria, Mazghouna, Rod El Farag, Shubra, Toura. SP: Wadi El Ghazal. UNV: Assuit, Aswan, Idfu, Luxor, Toshka, Wadi Halfa.
 10. *Bembidion (Notaphocampa) moursyi* Abdel-Dayem, 1998: 189
 Type locality: Toshka (Aswan, UNV)
 Type depository: CUC
 Distribution: UNV: Khur Galal, Toshka, Wadi Alaqi.
Subtribe: Tachyina Motschulsky, 1862
Genus: Helenaea Schatzmayr and Koch, 1934
 11. *Helenaea torretassoi* Schatzmayr and Koch, 1934: 23
 Type locality: El Tor (Southern Sinai, SP).
 Type depository: MCNM
 Distribution: known only from the type locality.
Genus: Lymnastis Motschulsky, 1862
 12. *Lymnastis sinaiticus* Schatzmayr, 1936: 59
 Type locality: Wadi Isla (Southern Sinai, SP)
 Type depository: MCNM
 Distribution: known only from the type locality
Genus: Porotachys Netolitzky, 1914
 13. *Porotachys efflatouni* (Schatzmayr and Koch, 1934)
Tachys efflatouni Schatzmayr and Koch, 1934: 20
 Type locality: Wadi Aideb (Red Sea, GE)
 Type depository: MAC
 Distribution: known only from the type locality
 14. *Porotachys shahinei* (Schatzmayr and Koch, 1934)
Tachys shahinei Schatzmayr and Koch, 1934: 20
 Type locality: Wadi Anid (Red Sea, GE)
 Type depository: MAC
 Distribution: no record other than the type specimen.
Genus: Tachys Dejean, 1821
 15. *Tachys (Tachys) centromaculatus aegyptiacus* Schatzmayr and Koch, 1934: 13
 Type locality: Mex (Alexandria, MC)
 Type depository: MCNM
 Distribution: DLNV: Borgash, Cairo, Helwan, Lake Qaroun, Mansouriya, Toura. ED: Ismailia, Nefisha. MC: Alexandria, Kafr El Batikh, Le Cap Mariout. SP: Zaranik. WD: Siwa Oasis.
Genus: Tachyura Motschulsky, 1862
 16. *Tachyura (Tachyura) akkadi* Abdel-Dayem, 2009: 72
 Type locality: Wadi Aideb, (Red Sea, GE)
 Type depository: MAC
 Distribution: no record other than the type specimen.
 17. *Tachyura (Tachyura) fadli* Abdel-Dayem, 2009: 72
 Type locality: Salouga Island Protectorate (Aswan, UNV)
 Type depository: CUC
 Distribution: recorded only from the type locality.
 18. *Tachyura (Tachyura) sinaitica* (Schatzmayr, 1936)
Tachys sinaiticus Schatzmayr, 1936: 55, 58
 Type locality: Wadi Isla (Southern Sinai, SP)
 Type depository: MCNM
 Distribution: SP: Wadi Isla, Wadi Zaouatina.
Tribe: Pogonini Laporte, 1834
Genus: Sirdenus Dejean, 1828
 19. *Sirdenus (Syrdenopsis) extensus* Chaudoir, 1871: 35
 Type locality: Red Sea coast (without giving specific locality)
 Type depository: MNHN
 Distribution: Schaum collected this species from Egypt on the banks of the Red Sea (Chaudoir, 1871); it has not been collected since the original description.
Subfamily: Harpalinae Bonelli, 1810
Tribe: Chlaeniini Brullé, 1834
Subtribe: Chlaeniina Brullé, 1834
Genus: Chlaenius Bonelli, 1810
 20. *Chlaenius (Nectochlaenius) canariensis sinaiticus* Peyerimhoff, 1907: 6
 Type locality: Wadi El Ain (Southern Sinai, SP)
 Type depository: MNHN
 Distribution: SP: Wadi Arbaein, Wadi Budz, Wadi El Ain, Wadi Geghir, Wadi Hebran, Wadi Isla.
 21. *Chlaenius (Trichochlaenius) tenellus* Klug, 1832: pl. 24
 Type locality: Alexandria (Alexandria, MC)
 Type depository: MHNB
 Distribution: DLNV: Badrashien, Cairo, El Wasta, Giza, Sakkara, Talbiya. MC: Alexandria, Port Said. UNV: Assuit, Luxor.
Tribe: Cyclosomini Laporte, 1834
Subtribe: Cyclosomina Laporte, 1834
Genus: Tetragonoderus Dejean, 1829
 22. *Tetragonoderus (Tetragonoderus) aegypticus* Jedlička, 1952: 80
 Type locality: Egypt
 Type depository: HNHM
 Distribution: no record other than the type specimen.
 23. *Tetragonoderus (Tetragonoderus) assuanensis* Mjöberg, 1905: 2
 Type locality: Aswan (Aswan, UNV)
 Type depository: SMNH
 Distribution: not collected since it was described.
Subtribe: Masoreina Chaudoir, 1870
Genus: Aephnidius W.S. MacLeay, 1825
 24. *Aephnidius rutilus* (Schaum, 1863)
Masoreus rutilus Schaum, 1863: 79
 Type locality: Egypt
 Type depository: MHNB
 Distribution: DLNV: Cairo, Fayoum, Kafr Hakim, Kirdasa. MC: Mersa Matrouh, Salloum. SP: Arish, Romani.
Tribe: Harpalini Bonelli, 1810
Subtribe: Harpalina Bonelli, 1810
Genus: Siopelus Murray, 1859

25. *Siopelus laevicollis* N. Ito, 1995: 157
 Type locality: Arabian Desert (probably Sinai Peninsula, according to Dr. Fritz Hieke)
 Type depository: MHNH
 Distribution: no record other than the type specimen.
- Subtribe: Stenolophina Kirby, 1837**
Genus: Anthracus Motschulsky, 1850
26. *Anthracus boops* (J.R. Sahlberg, 1900)
Acupalpus boops J.R. Sahlberg, 1900: 140
 Type locality: Pyramids (Giza, DLNV)
 Type depository: HNHM
 Distribution: DLNV: Abu Rawash, Alag, Cairo, Ezbet El Nakhle, Fayoum, Giza, Helwan, Kirdasa, Maadi, Marg, Massara, Mazghouna, Pyramids, Rod El Farag, Sakkara, Toura, Waraq. MC: Alexandria.
- Genus: Dicheirotichus Jacquelin du Val, 1857**
27. *Dicheirotichus (Pelagophilus) punicus aegyptiacus* Schatzmayr, 1936: 80
 Type locality: Mediterranean coast from Hammam to Alexandria (MC)
 Type depository: MCNM
 Distribution: MC: Abu Qir, Amrieh, Burg El Arab, King Mariout, Mex, Ras El Bar.
- Tribe: Lebiini**
Subtribe: Apenina
Genus: Platytarus Fairmaire, 1850
28. *Platytarus faminii petroffi* Antoine, 1933: 98
 Type locality: Alexandria (Alexandria, MC)
 Type depository: MNHN
 Distribution: DLNV: Abu Rawash, Barrage, Beni Mazar, Cairo, Giza, Marg, Talbiya. MC: Alexandria, Tewfikieh.
- Subtribe: Dromiina Bonelli, 1810**
Genus: Calodromius Reitter, 1905
29. *Calodromius henoni* (Bedel, 1907)
Dromius henoni Bedel, 1907: 277
 Type locality: Cairo (Cairo, DLNV)
 Type depository: MNHN
 Distribution: DLNV: Cairo, Giza, Helmieh, Helwan, Marg, Zagazig, Zeitoun.
- Genus: Dromius Bonelli, 1810**
30. *Dromius (Dromius) alfieri* Peyerimhoff, 1927: 220
 Type locality: Sinai
 Type depository: MNHN
 Distribution: ED: Suez. SP: Gebel Asmar, Wadi Rayig, Wadi Rished.
- Genus: Microlestes Schmidt-Göbel, 1846**
31. *Microlestes fulvus* Alfieri, 1976: 26
 Type locality: Vicinity of Pyramids (Giza, DLNV)
 Type depository: ALFC
 Distribution: there no other record than the type specimen.
32. *Microlestes sinaiticus* Alfieri, 1976: 26
 Type locality: Wadi Godirate (Northern Sinai: SP)
 Type depository: USNM
 Distribution: no record other than the type specimen.
- Genus: Paradromius Fowler, 1887**
33. *Paradromius (Manodromius) cylindricollis* (Peyerimhoff, 1927)
Dromius cylindricollis Peyerimhoff, 1927: 218
 Type locality: Kafr El Sheikh (Sakha, DLNV)
 Type depository: MNHN
 Distribution: DLNV: Sakha, Shirbien.
- Genus: Psammodromius Peyerimhoff, 1927**
34. *Psammodromius noctivagus* Peyerimhoff, 1927: 222
 Type locality: Amrieh (Alexandria, MC)
 Type depository: MNHN
 Distribution: MC: Alexandria, Amrieh, Dekhielah, Hammam, Mersa Mariout, Matrouh.
- Subtribe: Lionychina Jeannel, 1948**
Genus: Tilius Chaudoir, 1876
35. *Tilius obscurellus obscurellus* (Dejean, 1831)
Dromius obscurellus obscurellus Dejean, 1831: 362
 Type locality: Egypt
 Type depository: MNHN
 Distribution: DLNV: Barrage, Cairo, El Roda, Helwan, Kafr Shukr, Mansouriya, Shubra, Wardan. UNV: Assuit, Aswan, Luxor, Kuashtamma, Wadi Halfa.
- Tribe: Odacanthini Laporte, 1834**
Genus: Eucolliuris Liebke, 1931
36. *Eucolliuris aegyptiaca* (Jedlička, 1960)
Colliuris aegyptiaca Jedlička, 1960: 597
 Type locality: Cairo (Cairo, DLNV)
 Type depository: BNHMF
 Distribution: known only from the type locality.
- Tribe: Pterostichini Bonelli, 1810**
Genus: Poecilus Bonelli, 1810
37. *Poecilus (Ancholeus) pharao* (Lutshnik, 1916)
Platysma pharao Lutshnik, 1916: 92
 Type locality: Egypt
 Type depository: Originally this species was described as *Feronia conformis* (Dejean, 1828), but the latter name is homonym of another species of *Pterostichus*. *Platysma pharao* Lutshnik is a replacement name. The type depository of *Feronia conformis* is MNHN.
 Distribution: DLNV: Abu Rawash, Ayat, Badrashin, Barrage, Birqash, Cairo, Dahshour, El Aksas, Gezira, Giza, Helwan, Kafr Hakim, Kirdasa, Lake Qaroun, Maadi, Mansoura, Massara, Pyramids, Sakkara, Talbiya, Toura. MC: Amrieh, Mex, Ramleh. SP: Sharm El-Sheikh. UNV: Assuit, El Balyana, Luxor, Qena, Wadi Halfa. WD: Kharga Oasis.
- Tribe: Sphodrini Laporte, 1834**
Subtribe: Atranopsina Baehr, 1982
Genus: Platyderus Stephens, 1827
38. *Platyderus (Platyderus) ferrantei* Reitter, 1909: 29
 Type locality: Cairo (Cairo, DLNV)
 Type depository: HNHM
 Distribution: It is only known from type locality.
- Tribe: Zuphiini Bonelli, 1810**
Subtribe: Zuphiina Bonelli, 1810
Genus: Zuphium Latreille, 1806
39. *Zuphium (Zuphium) olens kochi* Schatzmayr, 1936: 106
 Type locality: Egypt
 Type depository: MCNM
 Distribution: DLNV: Cairo, Fayoum, Lake Qaroun, Marg, Mazghouna, Pyramids, Sakkara Toura. ED: Qantara. MC: Alexandria, Mex, Ramleh.
- Lymnastis sinaiticus* and *Bembidion moursyi* were described from Egypt by Schatzmayr (1936) and Abdel-Dayem (1998), respectively, but they have been overlooked in the Catalogue of Palaearctic Coleoptera (Kopecky 2003) and does not mentioned in the systematic list of extant ground beetles of the world (Lorenz, 2005). The distribution of *Porotachys efflatouni* and *Porotachys*

shahinei is wrongly cited as Sinai by Kopecky (2003): Schatzmayr and Koch (1934) described these two species from the Gebel Elba area (Wadi Aideb and Wadi Anid, respectively), and they have not been recorded from Sinai (Abdel-Dayem 2004) or any other locality until now.

There is no indication of where the holotypes of *Bembidion aegyptiacum*, *Clivina goniostoma*, *Aephnidius rutilus*, *Poecilus pharao*, *Tetragonoderus aegypticus*, *Tilius obscurellus obscurellus*, and *Zuphium olens kochi* were collected in Egypt, so it is difficult to determine their type localities.

The following 15 taxa have been described from Egypt, but there are no subsequent records other than the type specimens. *Clivina goniostoma*, *C. nitida*, *Dyschirius aida*, *Eucolliuris aegyptiaca*, *Lymnastis sinaiticus*, *Microlestes fulvus*, *M. sinaiticus*, *Platyderus ferrantei*, *Porotachys efflatouni*, *P. shahinei*, *Siopelus laevicollis*, *Sirdenus extensus*, *Tachyura akkadi*, *T. fadli*, *Tetragonoderus aegypticus*, and *T. assuanensis*.

The following carabid species have been considered as endemic to Egypt by at least one author, but should not be categorized as such:

1. *Abacetus longiusculus* Chaudoir, 1869. Although this species was recorded from Senegal and Sudan (Schatzmayr 1936), Bousquet (2003) reported it as endemic to Egypt.

2. *Bembidion karounense* Jedlička, 1959. This species is synonym of *B. latiplaga* Chaudoir, 1850 (Abdel-Dayem 1998).

3. *Chlaenius cruciatus* Dejean, 1831. While the type locality is Senegal, and it has been recorded from Sudan and Egypt (Schatzmayr 1936) and Libya (Le-Quellec and Ringenbach 2004), Kirschenhofer (2003) reported it as endemic to the Egyptian fauna.

4. *Chlaenius laeviplaga laeviplaga* Chaudoir, 1876. Although its type locality is Ethiopia, Kirschenhofer (2003) reported this species as endemic to Egypt.

5. *Chlaenius pharaonis* (Motschulsky, 1865). According to Lorenz (2005) this may be a synonym of *Chlaenius (Epomis) circumscriptus* (Duftschmid, 1812).

6. *Clivina erythrogyga* Putzeys, 1866. Balkenohl (2003) listed this species as endemic to Egypt, and *C. madagascariensis* from Yemen; meanwhile, he listed *C. natalensis* as a synonym of *C. madagascariensis*. Kult (1959) and Lorenz (2005) treated *C. erythrogyga* and *C. madagascariensis* as proper different species. However, according to Bruneau de Miré (1990) *C. erythrogyga* only separated from *C. madagascariensis* by its reddish brown elytral apex and that is why he has the opinion that *C. erythrogyga* is a subspecies of *C. madagascariensis*. Also Kult (1959) states that, apart from the colour of the apex, *C. erythrogyga* is very similar to *C. natalensis*. According to Ron Felix (unpublished data), there are no differences between the male genitalia of *C. madagascariensis*, *C. natalensis* and *C. erythrogyga* from the museum in Tervuren. Maybe *C. erythrogyga* is only a colour variation of *C. madagascariensis* as several specimens of the latter taxon may have a dark red tip or cross band at the apex of the elytra. After he studying several publications like the above mentioned and others, it is clear that *C. erythrogyga* has a rather vast distribution in Africa: from Guinea Bissau (Serrano, 1996) till East and Southwest Africa (Kult, 1959),

and according to Mateu (1966) in whole Africa. Therefore, apart from taxonomic status of this species, *C. erythrogyga* is not endemic to Egypt.

7. *Lophyridia fimbriata* (Dejean, 1831). This was reported wrongly as endemic to Egyptian fauna (Puchkov and Matalin 2003). It was described from Senegal, and has been recorded from Sudan and Egypt as *Cicindela dongalensis* Klug, 1832; clearly it is not a species endemic to the Egyptian fauna (Abdel-Dayem *et al.* 2003).

8. *Microlestes levipennis longipennis* Motschulsky, 1859. Egypt was indicated as the type locality for the holotype (ZMMU) of this species, and it has never been collected from Egypt since its description. Thus it is likely that this species comes from Anglo Egyptian Sudan (Schatzmayr 1936). Based on this comment, most likely this taxon is doubtful for the Egyptian fauna.

9. *Porotachys zulficari* (Schatzmayr and Koch, 1934). This was recorded as endemic to Egypt (Kopecky 2003). However, it can no longer be considered to be endemic since I have received specimens from the United Arab Emirates (from Ron F. Felix in 2009); these specimens were identical to the holotype of *P. zulficari* preserved in the MAC Collection.

10. *Tachys dimedius alexandrinus* Schatzmayr and Koch, 1934. This was recorded as endemic to Egypt (Kopecky 2003), but now has been reported from Libya (Le-Quellec and Ringenbach 2004).

11. *Tachys torretassoi* Schatzmayr and Koch, 1934. This was described from Suez, and has been considered to be endemic to Egypt (Kopecky 2003); however, it has been recorded from Palestine (Schatzmayr 1936) and the Emirates (Felix 2009).

12. *Zabrus ventricosus* (C. Zimmermann, 1931). This was reported as endemic to Egypt (Serrano and Andújar, 2003), but now has been recorded from Libya (Le-Quellec and Ringenbach 2004).

For more than 35 years, Alfieri (1976) remained the principal source of data on the Egyptian beetle fauna, while progressively becoming outdated. A new, revised and updated list of the endemic carabid species is provided here, recognizing 39 valid endemic species. This list does not claim to be complete, but provides an updated listing. Further continuous observations will be necessary to complete the species list.

Even more differences are apparent when compared to the last checklist compiled by Alfieri (1976), possibly due to nomenclatural and taxonomic problems, wrongly reported species, new described species, and distribution records from the Egyptian fauna or other adjacent countries. Undoubtedly, there are gaps in this list, particularly with respect to localities. As anticipated, a list of this nature is a reflection of collectors and their preferences and research projects. There are, for example, many fewer published papers or records available on the carabid fauna of the Western Desert in Egypt. Moreover, the taxonomic status of some Egyptian endemic species is questionable. This concern is especially for taxa described by Jedlička and Schatzmayr, which probably have never been revised. These need serious taxonomic work in future. Thirty nine species represents a significant number of endemic taxa; further surveys and distribution analysis are needed to illustrate the considerable significance of the country for

insect conservation. I hope that this work will be a basis for future taxonomical and ecological investigations of the Egyptian endemic species.

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LITERATURE CITED

- Abdel-Dayem, M.S. 1998. The Egyptian species of *Bembidion* Latreille, 1802 (Coleoptera, Carabidae). *Bulletin of the Entomological Society of Egypt* 76: 181-214.
- Abdel-Dayem, M.S. 2004. Diversity and spatial distribution of ground and tiger beetles (Carabidae, Coleoptera) in the Sinai peninsula, Egypt. *Bulletin of the Entomological Society of Egypt* 81: 57-80.
- Abdel-Dayem, M.S. 2009. Two new species of the ground beetle genus *Tachyura* Motschulsky, 1862 from Egypt (Coleoptera: Carabidae: Trechinae: Bembidiini). *Zoology in the Middle East* 48: 71-74.
- Abdel-Dayem, M.S., M.S. EL-Hawagry and S.A. Hassan. 2003. A review of the Egyptian species of tiger beetles (Coleoptera, Carabidae, Cicindelinae). *Bulletin of the Entomological Society of Egypt* 80: 193-217.
- Alfieri, A. 1976. The Coleoptera of Egypt (Monograph). *Mémoires de la Société Entomologique d'Égypte* 5: i-xvi, 1-361.
- Antoine, M. 1933. Notes d'entomologie marocaine. XIV. Carabiques nouveaux ou intéressants (Ins. Coléopt.). *Bulletin de la Société des Sciences Naturelles du Maroc* 13: 69-101.
- Balkenohl, M. 2003. Archostemata-Myxophaga-Adephaga; Family Carabidae: Subfamily Scaritinae; p. 219-234 In I. Löbl and A. Smetana (ed.). *Catalogue of Palaearctic Coleoptera*. Volume 1: Denmark: Stenstrup, Apollo Books.
- Bedel, L. 1907. *Catalogue raisonné des Coléoptères du nord de l'Afrique. (Maroc, Algérie, Tunisie et Tripolitanie) avec notes sur la faune des Îles Canaries et de Madère, première partie*. Paris: Société Entomologique de France. 402 pp.
- Bousquet, Y. 2003. Archostemata-Myxophaga-Adephaga; Family Carabidae: Subfamily Harpalinae: Tribe Abacetini; p. 346-347 In I. Löbl and A. Smetana (ed.). *Catalogue of Palaearctic Coleoptera*. Volume 1: Denmark: Stenstrup, Apollo Books.
- Brooks, T.M., R.A. Mittermeier, G.A.B. da Fonseca, J. Gerlach, M. Hoffmann, J.F. Lamoreux, C.G. Mittermeier, J.D. Pilgrim, and A.S.L. Rodrigues. 2006. Global biodiversity conservation priorities. *Science* 313:58-61.
- Bruneau de Miré, Ph., 1990, Les Coléoptères Carabiques du Tibesti. *Annls. Soc. ent. Fr. (N.S.)*, 26, 4: 499-554.
- Chaudoir, M. de. 1871. Essai monographique sur le groupe des pogonides. *Annales de la Société Entomologique de Belgique* 14: 21-61.
- Csiki, E. 1928. Carabidae II. Mormolycinae et Harpalinae I (Pars 97); p. 1-226 In W. Junk and S. Schenkling (ed.). *Coleopterorum Catalogus*. Volume II. Berlin: W. Junk.
- Dejean, P.F.M.A. 1822. New species; 91-134, pl. 6-10 In P.A. Latreille and P.F.M.A. Dejean *Histoire naturelle et iconographie des insectes coléoptères d'Europe*. 1-e livraison, Paris: Crevot.
- Dejean, P.F.M.A. 1831. *Species général des coléoptères, de la collection de M. le Comte Dejean*. Tome cinquième. Paris: Méquignon-Marvis. viii + 883 pp.
- El-Moursy, A.A., M.S. El-Hawagry, M.S. Abdel-Dayem and H.H. Fadl. 2001. Insect diversity in Zaranik Protectorate, Northern Sinai, Egypt. *Egyptian Journal of Natural History* 3: 62-80.
- El-Gharbawy, A.A. and M.M. Salem. 2003. Occurrence and distribution of family Carabidae (Coleoptera) in Egypt. *Al-Azhar Bulletin of Science* 14 (2): 53- 63.
- Felix, R.F.F.L. 2009. Order Coleoptera, family Carabidae. *Arthropod fauna of the UAE* 2:66-141.
- Ito, N. 1995. A new genus and two new species of the Selenophori group (Harpalini, Carabidae, Coleoptera). *Japanese Journal of Systematic Entomology* 1(2): 153-159.
- Jedlička, A. 1952. Neue Carabiden aus der Sammlung des ungarischen naturwissenschaftlichen Museums in Budapest (Col.). *Annales Historico-Naturales Musei Nationalis Hungarici* 43 (2): 79-93.
- Jedlička, A. 1960. Neue Carabiden aus der Sammlungen des Museums Frey (Col.). *Entomologischen Arbeiten aus dem Museum G. Frey* 11: 587-598.
- Kirschenhofer, E. 2003. Archostemata-Myxophaga-Adephaga; Family Carabidae: Subfamily: Harpalinae: Tribe: Chlaeniini; p. 347-356 In I. Löbl and A. Smetana (ed.). *Catalogue of Palaearctic Coleoptera*. Volume 1: Denmark: Stenstrup, Apollo Books.
- Klug, J.C.F. 1832. Decas tertia; Sheets a-f, pl. xxi-xxx In *Symbolae Physicae, seu icones et descriptiones insectorum, quae ex itinere per Africam borealem et Asiam occidentalem Friderici Guilelmi Hemprich et Christiani Godofredi Ehrenberg studio novae aut illustratae redierunt*. 42 un. Sheets+50 pl., Berlin: Mittler.
- Kopecky, T. 2003. Archostemata-Myxophaga-Adephaga; Family Carabidae: Subfamily: Trechinae: Tribe Bembidiini: Subtribe Tachyina; p. 273-280 In I. Löbl and A. Smetana (ed.). *Catalogue of Palaearctic Coleoptera*. Volume 1: Denmark: Stenstrup, Apollo Books.
- Kult, K., 1959, Revision of the African Species of the old Genus *Clivina* Latr. *Revue de Zoologie et de Botanique Africaines* LX, 1-2: 172-225.
- Le-Quellec, J.L. and J.C. Ringenbach: *Beetles of Libya*. 16 June 2004. Electronic website accessible at <http://jcringenbach.free.fr>. Accessed on 4 October 2011.
- Löbl, I. and A. Smetana. 2003. *Catalogue of Palaearctic Coleoptera*. Volume 1: Archostemata-Myxophaga-Adephaga. Copenhagen: Apollo Books. 819 p.
- Lorenz, W., 2005, *Systematic list of extant Ground Beetles of the world. (Insecta Coleoptera "Geadephaga": Trachypachidae and Carabidae incl. Paussinae, Cicindelinae, Rhysodinae)*, second edition. Tutzing: W. Lorenz, 530p.
- Lutshnik, V.N. 1916. *Analecta synonymica de quibusdam Platysmatinis (Coleoptera, Carabidae)*. II. *Russkoe Entomologicheskoe Obozrenie* 16: 92.
- Mateu, J., 1966, Coléoptères Carabiques récoltés par J. Mateu dans l'Ennedi et au Nord-Tchad. *Bulletin de l'I.F.A.N.*, T. XXVIII, sér. A, 4: 1501-1544.
- Mjöberg, E. 1905. Coleoptera of the Swedish Zoological Expedition to Egypt and the White Nile. Fam. Cicindelidae and Carabidae; p. 1-20 In K.W. Appelberg (ed.). *Results of the Swedish Zoological Expedition to Egypt and White Nile 1901 under the direction of L.A. Jägerskiöld*. 10a: Uppsala: the Library of the Royal University.
- Motschulsky, V. de. 1859. Insectes nouveaux ou peu connus des basins de la Méditerranée et de la mer Noire jusqu'à la mer Caspienne. *Etudes Entomologiques* 8: 119-144.
- Motschulsky, V. de. 1865. Énumération des nouvelles espèces de Coléoptères rapports de ses voyages. 4-ème article. (Suite). *Bulletin de la Société Impériale des Naturalistes de Moscou* 37: 297-355.
- Peyerimhoff, P. de. 1907. Liste des Coléoptères du Sinai. *L'Abeille, Journal d'Entomologie* 31: 1-55.
- Peyerimhoff, P. de. 1927. Carabides égyptiens (Colépt.). *Bulletin de la Société Royale Entomologique d'Égypte* 19: 218-223.
- Puchkov, A.V. and A.V. Matalin. 2003. Archostemata-Myxophaga-Adephaga; Family Carabidae: Subfamily Cicindelinae; p. 99-118 In I. Löbl and A. Smetana (ed.). *Catalogue of Palaearctic Coleoptera*. Volume 1: Denmark: Stenstrup, Apollo Books.
- Putzeys, J.A.A.H. 1866. Révision générale des clivinides. *Annales de la Société Entomologique de Belgique* 10: 1-242.
- Reitter, E. 1909. Espèces nouvelles de Coléoptères égyptiens. *Bulletin de la Société Entomologique d'Égypte* 1: 29-32.
- Sahlberg, J.R. 1900. Bestimmungs-Tabellen der europäischen Coleopteren. XLI. Heft. Enthaltend Carabidae. Abtheilung: Harpalini und Licinini. *Verhandlungen des Naturforschenden Vereines in Brünn* 38: 33-155.
- Schatzmayr, A. 1936. Risultati scientifici della spedizione entomologica di S.A.S. il Principe Alessandro della Torre e Tasso in Egitto e nella penisola del Sinai. XII. Catalogo ragionato dei Carabidi finora noti d'Egitto e del Sinai. *Pubblicazioni del Museo entomologico Pietro Rossi* 14(1): 1-114.
- Schatzmayr, A. and C. Koch. 1933. Risultati scientifici della spedizione entomologica di S.A.S. il Principe Alessandro della Torre e Tasso in Egitto e nella Penisola Sinai. I. Descrizione di un nuovo genere appartenente alla sezione dei Clivina (Coleotteri: Carabidae-Scaritinae). *Bulletin de la Société Royale Entomologique d'Égypte* 17: 121-125.
- Schatzmayr, A. and C. Koch. 1934. Risultati scientifici della spedizione entomologica di S.A.S. il Principe Alessandro della Torre e Tasso in Egitto e nella Penisola Sinai. IV. *Tachys* Steph. *Bollettino della Societe Adriatica di Scienze Naturali Trieste* 33: 1-23.
- Schaum, H.R. 1863. Beiträge zur Kenntniss einiger Carabiden-Gattungen. *Berliner Entomologische Zeitschrift* 7: 67-92.

- Semida, F.M., M.S. Abdel-Dayem, S.M. Zalat and F.S. Gilbert. 2001. Habitat heterogeneity and altitudinal gradients in relation to beetle diversity in South Sinai, Egypt. *Egyptian Journal of Biology* 3: 137-146.
- Serrano, A.R.M., 1996, Estudo de Coleópteros Carabídeos (Coleoptera: Carabidae) da Guiné-Bissau. I. Cymbionotinae, Siagoninae, Hiletinae, Scaritinae e Apotominae (1). *Boletim da Sociedade Potuguesa de Entomologia*, 162, Vol. Vi-12: 149-171.
- Serrano, J. and A. Andújar. 2003. Archostemata-Myxophaga-Adephaga; Family Carabidae: Tribe Zabrinini: Subtribe Zabrina; p. 568-573 In I. Löbl and A. Smetana (ed.). *Catalogue of Palaearctic Coleoptera*. Volume 1: Denmark: Stenstrup, Apollo Books.

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