Mendel University in Brno

5th International Tenebrionoidea Symposium

Prague, Czech Republic

March 5–6th 2018

Faculty of Forestry and Wood Technology

MUSAEUM NATIONALE 1818

NÁRODNÍ MUZEUM

Symposium Schedule

Monday 5th March 2018

9:00 / Registration opens

9:30 / Welcome addresses, Institutional Greetings and Announcements

10:00 – 11:00 / **Talks**

11:00 – 11:30 / Coffee Break

11:30 – 12:30 / **Talks**

12:30 – 14:00 / Lunch

14:00 – 15:00 / **Talks**

15:00 – 15:30 / Coffee Break

15:30 – 16:10 / **Talks**

16:10 – ??? ☺ **/ Discussion**

19:00 DINNER – place (restaurant) to be specified at the symposium

Tuesday 6th March 2018

10:00 – 11:00 / **Talks**

11:00 – 12:00 / **Poster Session**

12:00 – 13:00 / Lunch

13:00 – 14:00 / **Talks**

Symposium closing session

Visit Tenebrionidae collection of Natural History Museum Prague.

Note: Part of the participants can shortly visit (approx. 3 and perhaps 4-5 hours) the Tenebrionidae collection on Tuesday already. This option is suitable for those who leave on Wednesday morning or before midday.

The others will visit the collection on Wednesday or/and Thursday, where they can spend whole day. Please note, that there is limited space and according to the information given more than approx. 10 persons will not enjoy the collection much as there will be overcrowded. But I believe we can shift somehow.

In the museum you will be hosted by Jiří Hájek, Lukáš Sekerka or Martin Fikáček.

Symposium Programme

Monday 5th March 2018

9:00 / Registration opens
9:30 / Welcome addresses, Institutional Greetings and Announcements

Talks

10:00 – 10:20 / **Maxwell V. L. Barclay**
The Tenebrionidae Collection of the Natural History Museum.
Maxwell V. L. Barclay
10:20 – 10:40 / **Harold Labrique**
The tenebrionid beetles in the Musée des confluences collections
Harold Labrique
10:40 – 11:00 / **Sergio Aloquio**
Brazilian Tenebrionidae: what is known and what are the future perspectives
Sergio Aloquio

11:00 – 11:30 / Coffee Break

11:30 – 11:50 / **Patrice Bouchard**
Contribution to the knowledge of the darkling beetle subfamily Phrenapatinae (Coleoptera: Tenebrionidae): checklist of the world fauna and description of pupae.
Patrice Bouchard
11:50 – 12:10 / **Kojun Kanda**
Taxonomic Studies of New World Laenini (Tenebrionidae: Lagriinae).
Kojun Kanda, M. Andrew Johnston
12:10 – 12:30 / **Wolfgang Schawaller**
"Ultra"-psammophilous Tenebrionidae in the deserts of the Old World.
Wolfgang Schawaller

12:30 – 14:00 / Lunch

14:00 – 14:20 / **Warren E. Steiner, Jr.**
Descriptions of the larva, pupa, habitats and life history of the North American darkling beetle *Idiobates castaneus* (Knoch) (Coleoptera: Tenebrionidae; Tenebrionini).
Warren E. Steiner, Jr.
14:20 – 14:40 / **Smith, A.D.**
Biodiversity and Phylogeny of Pimeliinae: preliminary findings and next steps.
Smith, A.D., K. Kanda, M. Kaminski, P. Bouchard, G. Flores, G. Kergoat, F. Condamine, R. Aalbu, A. Lamb, L. Purchart
14:40 – 15:00 / **Rolf L. Aalbu**
Assessing the current status of the Edrotini.
Rolf L. Aalbu, Christopher C. Wirth

15:00 – 15:30 / Coffee Break

VARIOUS

PIMELIINAE

15:30 – 15:50 / **Gustavo E. Flores**
Revision of the Edrotini (Tenebrionidae: Pimeliinae) of Peru.
Alfredo E. Giraldo Mendoza, Gustavo E. Flores
15:50 – 16:10 / **Christopher C. Wirth**
Towards a Revision of the genus *Edrotes.*
Christopher C. Wirth

PIMELIINAE

Discussion

Potential localities and dates for the **6th** International Tenebrionoidea Symposium. (Presenters can give talk about the most suitable options for the host country).
Decide a journal, dates, etc. for publishing the symposium Proceedings.

Tuesday 6th March 2018

Talks

10:00 – 10:20 / **Gustavo E. Flores**
Revision of the Neotropical subgenus *Mesopraocis* Flores & Pizarro-Araya of the genus *Praocis* Eschscholtz (Pimeliinae: Praociini).
Gustavo E. Flores, Jaime Pizarro-Araya
10:20 – 10:40 / **Fabien L. Condamine**
Evolution of endemism and drivers of island diversification for multiple colonizations and replicated radiations of beetles on an ancient oceanic island.
Fabien L. Condamine, Laurent Soldati, Anne-Laure Clamens, Roula Jabbour-Zahab, Hervé Jourdan, Gael J. Kergoat
10:40 – 11:00 / **Marcin Jan Kamiński**
Ex Africa semper aliquid novi: biogeography of the tribe Dendarini (Tenebrionidae).
Marcin Jan Kamiński, Dariusz Iwan, Kojun Kanda, Aaron D. Smith

BIOGEOGRAPHY, PHYLOGENY, EVOLUTION

11:00 – 12:00 / ***Poster Session***

12:00 – 13:00 / Lunch

Talks

13:00 – 13:20 / **Alvaro Zúñiga-Reinoso**
Preliminary studies about the genetics and phylogenetics patterns of the darkling beetles (Coleoptera, Tenebrionidae) from Atacama Desert.
A. Zúñiga-Reinoso, L. Regioneri, M. Bläser, J. Oly, G. Flores, R. Predel
13:20 – 13:40 / **Dirim Sendogan**
Is *Turkonalassus* Keskin, Nabozhenko et Keskin, 2017 (Tenebrionidae, Helopini) a new genus? A molecular insight!
Bekir Keskin, Dirim Sendogan, Maxim Nabozhenko, Nursen Alpagut Keskin
13:40 – 14:00 / **Nursen Alpagut Keskin**
Karyological Variations in Tenebrionidae.
Nursen Alpagut Keskin, Dirim Sendoğan, Utku Calısan, Cosku Ögren, Bekir Keskin, Maxim V. Nabozhenko

Symposium closing session

Visit Tenebrionidae collection of Natural History Museum Prague.

ABSTRACTS OF SYMPOSIUM TALKS

Note:

- Abstracts are arranged alphabetically according to the name of first author.
- Authors are responsible for linguistic correctness, thus the text of abstracts was not linguistically checked. At most only apparent typing errors were corrected.
- In some cases the abstract title is ended with (p) indicating, that author(s) wants to submit the contribution to the proceedings (journal and editor to be decided during symposium).

Assessing the current status of the Edrotini

ROLF L. AALBU[1], CHRISTOPHER C. WIRTH[2]

[1]*Department of Entomology, California Academy of Sciences, San Francisco, USA*
[2] *Northern Arizona University, Flagstaff, USA*

As presently recognized, the tribe Edrotini was formed from the merger of several New World tribes and is composed of 409 species representing 53 genera. While one genus is restricted to Asia, the majority of the tribe occurs only in the New World. A detailed morphological and genetic study is presently underway. Numerous genera likely represent synonymies and a significant proportion of genera are also in need of revision. Additionally, we know of at least three new genera and numerous undescribed species in existing genera which we plan to describe. Based on preliminary molecular analysis, a division of tribe or the inclusion of Old World genera may be necessitated after further taxonomic sampling.

Brazilian Tenebrionidae: what is known and what are the future perspectives

SERGIO ALOQUIO

Departamento de Biologia Geral, Universidade Federal de Viçosa, Viçosa, Brasil

Tenebrionidae is the seventh biggest Coleoptera family, with around 20000 species described, of which around 1400 reported to Brazil. No resident taxonomist has ever worked with the family as the main study object, therefore we can call Tenebrionidae as a neglected family in Brazil. The poor knowledge of the Brazilian fauna of Tenebrionidae is evidenced by the great number of unnamed species and the named species but with no official report in the Brazilian collections. The biggest works with our fauna date back to the XIX and early XX centuries, since them, no expressive works had been done, with only sparse papers describing species. Since 2011 we have been trying to change this scenario, focusing in the Neotropical fauna, specially the Brazilian. We are developing taxonomic and comparative morphology, in search of new taxonomic characters that may help future works and, thereby, to lure new researchers. Until now, we have been working with the forest fauna, given that it is easier to us to collect

with our budget to research. In the future we intend to expand to the open areas, including arid and semi-arid environments, in which we expect to find an even more diverse fauna.

The Tenebrionidae Collection of the Natural History Museum

MAXWELL V. L. BARCLAY

Department of Life Sciences, Natural History Museum, London, United Kingdom

The Tenebrionidae Collection of the Natural History Museum in London dates back to the 1700s, and comprises almost 15,000 species in 1,600 genera, that is around 70% of the estimated described specific and generic diversity of the family. 5500 species are represented by type material. The largest single contribution to our tenebrionid collection was made by the English entomologist George Charles Champion (1851-1927) but the collection has also been greatly enhanced by collaboration and exchanges with specialists around the world, most notably Zoltan Kaszab and Karl Koch. This continues today, and of the 20 most productive workers on the Natural History Museum's tenebrionid collection, three: Kimio Masumoto, Hans Bremer and Julio Ferrer, are our contemporaries. In recent years, more than 150 loans of nearly 9,000 specimens have been issued from the collection, to 44 taxonomists. Max Barclay will discuss the history, use and importance of this collection, and some of the highlights of 300 years of collecting tenebrionids.

Contribution to the knowledge of the darkling beetle subfamily Phrenapatinae (Coleoptera: Tenebrionidae): checklist of the world fauna and description of pupae. (p)

PATRICE BOUCHARD

Canadian National Collection of Insects, Arachnids and Nematodes, Agriculture and Agri-Food Canada, Ottawa, Ontario, Canada

The little-studied subfamily Phrenapatinae is distributed worldwide but is especially diverse in tropical regions. All life stages of the known species occur in dead wood. Watt (1974) and Doyen and Lawrence (1979) established the taxonomic concepts currently used for this subfamily however the monophyly of this clade, of its three tribes and its 26 genera has not been tested. Adults are characterized by the presence of a well-defined groove between the eye and the buccal cavity for the reception of the antennae, as well as by the lack abdominal defense glands and extremely reduced female ovipositors. The mandibles, head and/or prothorax of some species bear projections or depressions that appear similar to those in other beetle groups that occur in dead wood (e.g., Passalidae, Lucanidae) although their function has not been assessed. The small number of known Phrenapatinae pupae lack the typical abdominal "gin traps" found in other tenebrionids. Instead, they bear lateral spines on abdominal segments 1 to 7 or 8 that project laterally. The objectives of this paper are to 1) summarize published information about the diversity and distribution of Phrenapatinae, and 2) formally describe and illustrate all known pupae in this subfamily.

Evolution of endemism and drivers of island diversification for multiple colonizations and replicated radiations of beetles on an ancient oceanic island

FABIEN L. CONDAMINE [1,2], LAURENT SOLDATI [1], ANNE-LAURE CLAMENS [1], ROULA JABBOUR-ZAHAB [1,3], HERVE JOURDAN [4], GAEL J. KERGOAT [1]

[1] *CNRS, Institut des Sciences de l'Evolution (Université de Montpellier), Montpellier, France;*
[2] *INRA, Centre de Biologie pour la Gestion des Populations (INRA / IRD / CIRAD / Montpellier SupAgro), Montferrier-sur-Lez, France;*
[3] *CNRS, CEFE (CNRS, Université de Montpellier), Montpellier, France;*
[4] *IRD, IMBE (INEE, Centre IRD de Nouméa), Nouméa, Nouvelle-Calédonie.*

The endemic species richness on New Caledonia, relative to its landmass area, is one of the most diverse and rich in the world. Phylogenetic studies have investigated the origin of this biodiversity and have shown that the hypothesis of a late Eocene re-emergence is the most likely explanation for the origin of New Caledonian biota. However, most of these studies focused on relatively derived groups and of young origins. Studying an ancient group with multiple and independent radiations can provide new insights, and among these Gondwanan groups occurring in New Caledonia are the darkling beetles (Tenebrionidae). About 230 species are described in this archipelago and 93% are endemic. Many of these species have restricted geographical ranges and can be viewed as local endemic (or microendemic). A comprehensive hypothesis explaining the origin of this rich biodiversity and the evolution of this microendemism has yet to be developed. Using large-scale phylogenetic analyses of the family including most of the New Caledonian tenebrionids, we investigate the colonization times of the island and estimated the drivers of species diversification following colonizations. We then focus on three species-rich genera (*Callismilax*, *Isopus* and *Uloma*), and provide compelling evidence for very rich (and underestimated) microendemic diversity within each genus. We show that speciation generally involves a three-step process: range expansion, range fragmentation, and the development of reproductive isolation between spatially separated populations. We suggest that such allopatric speciation (even for good dispersers) may have been induced by large-scale reconfigurations of the landscape that isolate formerly continuous populations, such as the uplift of mountains or the formation of large rivers. Landscape building has probably been a primary driver of biological diversification. These results provide also a basis for prioritizing conservation actions of the remaining natural forest habitats on the island.

Revision of the Neotropical subgenus *Mesopraocis* Flores & Pizarro-Araya of the genus *Praocis* Eschscholtz (Pimeliinae: Praociini). (p)

GUSTAVO E. FLORES[1], JAIME PIZARRO-ARAYA[2,3]

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[3] *Instituto de Investigación Multidisciplinar en Ciencia y Tecnología, Universidad de La Serena, La Serena, Chile.*

Praociini is a tribe of Pimeliinae distributed in Western and Southern South America with 151 species arranged in 15 genera. Of these, the most specious genus is *Praocis* Eschscholtz with 77 species and 8 subspecies arranged in nine subgenera distributed in arid lands from Central Peru and Bolivia to the Southern part of Patagonia in Chile and Argentina. In this contribution we revise the subgenus *Mesopraocis* Flores & Pizarro-Araya which is composed of four species endemic to northern Chile and inhabit from 25° South (Paposo, Antofagasta Region) to 31° South (Caleta Limarí, Coquimbo Region). The species of this genus extend from sea level to an altitude of ~1325 msl and are associated with coastal dunes stabilized with vegetation or paleodunes in the transitional coastal desert of Chile. *Praocis flava* Kulzer is synonymized with *P. pilula* Laporte. Other species of the subgenus are: *Praocis calderana* Kulzer, *Praocis nitens* Kulzer, and a new species. We present an analysis of the characters of the species concluding that species can be distinguished by characters of pronotum. Habitus illustrations, a comparative table of characters, and a distribution map are also presented.

Ex Africa semper aliquid novi: biogeography of the tribe Dendarini (Tenebrionidae)

MARCIN JAN KAMIŃSKI[1], DARIUSZ IWAN[1], KOJUN KANDA[2], AARON D. SMITH[2]

[1] *Museum and Institute of Zoology, Polish Academy of Sciences, Warsaw, Poland;*
[2] *Northern Arizona University, Department of Biological Sciences, Flagstaff, USA.*

Dendarini is a species-rich tribe of darkling beetles, containing over 400 species in its two subtribes, Dendarina and Melambiina. They are found disjunctly in the Palaearctic region (especially Mediterranean area) and Southern Africa (including Madagascar), and this distribution has been deeply affected by the region's complex geological and climatic history. A time-calibrated molecular phylogeny was used to reconstruct the historical biogeography of the Dendarini, in order to explore the tribe's origin and the biogeographical process which resulted in the presently observed distribution.

Taxonomic Studies of New World Laenini (Tenebrionidae: Lagriinae)

KOJUN KANDA[1], M. ANDREW JOHNSTON[2]

[1] *Northern Arizona University, Department of Biological Sciences, Flagstaff, USA;*
[2] *Biodiversity Knowledge Integration Center Arizona State University*

Laenini Seidlitz, 1895 has traditionally been restricted to the Old World (Europe, Africa, and Asia), but recent phylogenetic studies demonstrate that a number of Central and South American taxa should be included in this tribe. The New World Laenini is currently composed of two described genera, *Chaetyllus* Pascoe, 1860 (7 species) and the recently described *Grabulax* Kanda, 2016 (1 species). Here we present preliminary results of a

revision of *Chaetyllus*. In addition to proposing over fifteen new species, we reverse the synonymy of *Rhicnodus* Fairmaire, 1892 under *Chaetyllus*. We also propose the transfer of *Plastica* Waterhouse, 1903 from Apocryphini Lacordaire, 1859 (Tenebrioninae) to Laenini and discuss two potentially undescribed genera that should also be included in the tribe.

Is *Turkonalassus* Keskin, Nabozhenko et Keskin, 2017 (Tenebrionidae, Helopini) a new genus? A molecular insight!

BEKIR KESKIN[1], DIRIM SENDOGAN[1], MAXIM NABOZHENKO[2,3], NURSEN ALPAGUT KESKIN[1]

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[3] Dagestan State University, Makhachkala, Russia.

The taxon *Turkonalassus* Keskin et al., 2017 is described as a genus containing 7 species, one distributed in Macedonia and others in Anatolia. As *Turkonalassus adimonius* (Allard, 1876), *Turkonalassus pentheri* (Reitter, 1905), *Turkonalassus bozdagus* (Keskin et Nabozhenko, 2010) are included to this new species respectively from genera *Probaticus* and *Nalassus; Turkonalassus pineus* Keskin et.al., 2017, *Turkonalassus quercanus* Keskin et.al., 2017, *Turkonalassus petrophilus* Keskin et.al., 2017, *Turkonalassus macedonicus* Keskin et.al., 2017 are the other members of this genus. Species of the genus *Turkonalassus* are superficially similar to representatives of *Euboeus* and are close to the genus *Nalassus* in genitalia morphology. In this study, phylogenetic relationships of the *Turkonalassus* species and the representatives of the other close genera were inferred using mitochondrial *COI* and nuclear *MP20* loci. ML and Bayesian analyses resolved and supported the monophyly of the *Turkonalassus* species consistent with patterns of morphological differentiation.

Karyological Variations in Tenebrionidae

NURSEN ALPAGUT KESKIN[1], DIRIM SENDOĞAN[1], UTKU CALISAN[1], COSKU ÖGREN[1], BEKIR[1] KESKIN, MAXIM V. NABOZHENKO[2,3]

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[3] Dagestan State University, Makhachkala, Russia.

The family Tenebrionidae is considered a karyologically conservative group due to the frequent occurrence of 2n = 20 formula. Heretofore, variations in the diploid chromosome numbers between 14–38 within the family are also noted. Although, Tenebrionids represent a hyperdiverse family of Coleoptera with ca. 20000 recognized species worldwide, chromosomal data are only available for 250 representatives of subfamilies Lagriinae, Tenebrioninae, Pimeliinae, Alleculinae and Diaperinae mostly distributed in Mediterranean.

The major patterns of karyological variations in tenebrionid beetles are mainly observed in sex determining systems, chromosome morphology and distribution of heterochromatin.
In this study, with the aim of revealing individual chromosomal differences, we compared the karyotypes of the beetles that show suggested modal and reduced meioformulas for Tenebrionidae. For these comparisons, we analyzed the mitotic and meiotic chromosomes of eight species from Tenebrioninae and Pimeliinae. We used specimens of *Akis subtricostata* as representatives for 2n=16 (7+NeoXY), *Cephalostenus elegans*, *Pimelia bajula*, *Trachyderma philistina* for 2n=18 (8+Xyp) and *Dailognatha quadricollis*, *Helops glabriventris*, *Nalassus plebejus*, *Tentyria cypria* for 2n=20 (9+Xyp). Karyotypic differences are mainly found in NOR localization, heterochromatin distribution, chromosome length and morphology. Although, these preliminary findings contribute to understanding of karyotype divergence in darkling beetles, it is necessary to increase the taxa sampling for major Tenebrionid lineages along with molecular cytogenetic and phylogenetic approaches.

The tenebrionid beetles in the Musée des confluences collections

HAROLD LABRIQUE

Musée des Confluences, Lyon, France

With approximately 17 000 boxes, the Musée des Confluences entomological collection is one of the most important in France after those of National Museum in Paris. Coleoptera represent approximately 40 % of this collection and the Tenebrionidae are present in most of the important collections of the Institution (Rey, Audras, Allemand, Réveillet, etc.). This family is particularly well represented in number of specimens and species in four collections: Picka's collection, general collection of Tenebrionidae, Coleoptera collection of Morocco and Pupier's collection. The work on the Moroccan fauna has yet permitted to describe some new species, to discover some species new for the country and to know better the distribution and phenology of the encountered species. An important work remains to make on the other collections because if the inventory of the typical material is globally ended, they still contain numerous not identified specimens.

Revision of the Edrotini (Tenebrionidae: Pimeliinae) of Peru (p)

ALFREDO E. GIRALDO MENDOZA[1], GUSTAVO E. FLORES[2]

[1] Universidad Nacional Agraria La Molina, Museo de Entomología Klaus Raven Büller, Lima, Perú;
[2] CONICET, Laboratorio de Entomología, Instituto Argentino de Investigaciones de las Zonas Áridas (IADIZA, CCT CONICET Mendoza), Mendoza, Argentina.

The tribe Edrotini is distributed in the Western Hemisphere with 49 genera and 397 species of which 43 genera and 344 species/subspecies are in North and Central America and 6 genera and 53 species/subspecies are in South America. In Peru it is represented by 11 species/subspecies grouped in the genera *Hylithus* Guérin-Méneville (5 species/subspecies),

the endemic *Prohyltihus* Kaszab (3 species), the monotypic and endemic *Kocakia* Kaszab (1 species) and 2 endemic undescribed species that does not fit in any of the know genera. We present an analysis of the characters of the species proposing some taxonomic changes and the creation of a new genus to include these two new species. Habitus illustrations, a comparative table of characters, and maps are also presented.

"Ultra"-psammophilous Tenebrionidae in the deserts of the Old World

WOLFGANG SCHAWALLER

Natural History Museum, Stuttgart, Germany

Carl Koch firstly, and about 50 years ago, postulated the theorie, that a striking discrepancy exists between the biological structure of the Namib desert in southwestern Africa and that of all other deserts of the world, and that in the vegetationless sand of shifting dunes a special ecological beetle community lives with numerous “ultra-psammophilous” species. The extraordinary high age of the Namib (about 80 Million years) with long and stable ecological conditions was considered to be the main reason for this particular evolution. However, Koch did not define clear differences between “ultra”-psammophilous and “normal”-psammophilous species. Furthermore, the adaptation to sand is often combined with adaptations to extreme temperature and dry habitats. Examples of sandliving tenebrionids with particular adaptations of morphology and behaviour are presented and discussed. Characteristic for these species are reduced flight abilities, and thus restricted distributional areas. So, they evolved at the present area of their distribution, and did not immigrate from other regions. In contrary to the theory of Koch, those species live not only in the African Namib, but also in other deserts of the Old World (Arabia, Turkmenia, Iran). The latter are much younger (10–30 Million years), but obviously old enough for highly adapted sand species. The only difference between Namib and the other deserts is the number of specialised taxa, being much higher in the Namib.

Biodiversity and Phylogeny of Pimeliinae: preliminary findings and next steps

SMITH, A.D.[1], K. KANDA[1], M. KAMINSKI[2], P. BOUCHARD[3], G. FLORES[4], G. KERGOAT[5], F. CONDAMINE[6,7], R. AALBU[8], A. LAMB[1], L. PURCHART[9]

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[7] INRA, Centre de Biologie pour la Gestion des Populations (INRA / IRD / CIRAD / Montpellier SupAgro), Montferrier-sur-Lez, France;
[8] Department of Entomology, California Academy of Sciences, San Francisco, USA;
[9] Mendel University in Brno, Department of Forest Ecology, Brno, Czech Republic

Pimeliinae (Coleoptera: Tenebrionidae) is a species-rich (8,000+ described species) worldwide subfamily of tenebrionids found primarily in deserts and other arid regions. Preliminary phylogenies for the subfamily are presented from multiple datasets, ranging from a few to hundreds of gene fragments. In particular, unusual or previously unrecognized relationships between taxa are discussed in light the resulting topologies. Plans to increase pimeliine taxon sampling and incorporate additional morphological and biogeographic datasets are discussed in relation to a recently funded international project on the subfamily.

Descriptions of the larva, pupa, habitats and life history of the North American darkling beetle *Idiobates castaneus* (Knoch) (Coleoptera: Tenebrionidae; Tenebrionini)

WARREN E. STEINER, JR.

Department of Entomology, Smithsonian Institution, Washington, USA

This study describes the larva and pupa of the monotypic darkling beetle *Idiobates castaneus* (Knoch) (Coleoptera: Tenebrionidae) in the tribe Tenebrionini, from eastern North America. The species inhabits forested regions where adults and associated larvae have been discovered under dry loose bark of dead standing trees where cavities or pockets of frass have formed, apparently following infestations of other insects and rodents. Identity of immature stages is confirmed by rearing of adults and pupae and preservation of associated exuvia. Distinctive characters of the larval abdominal apex and the armature of pupal "gin-traps" are illustrated. A key to the larvae of North American genera currently placed in Tenebrionini is included.

Towards a Revision of the genus *Edrotes*

CHRISTOPHER C. WIRTH

Northern Arizona University, Flagstaff, USA

The New World genus *Edrotes* (Coleoptera: Tenebrionidae: Pimeliinae) occurs in many sand dunes systems in western North America. Within this genus there is a high degree of morphological variability and twenty-four species have been described in the genus, within two subgenera, but most of these names were synonymized under two widely-distributed species by later workers. Presently *Edrotes* is composed of five species, with two described after the last revision of the genus. A comprehensive study of the genus is underway and here we present a review of *Edrotes* subgenera and species, discuss the biogeography of the genus, and propose the restoration of two synonymies.

Preliminary studies about the genetics and phylogenetics patterns of the darkling beetles (Coleoptera, Tenebrionidae) from Atacama Desert

ALVARO ZÚÑIGA-REINOSO[1], LAPO REGIONERI[1], MARCEL BLÄSER[1], JULIA OLY[1], GUSTAVO FLORES[2] AND REINHARD PREDEL[1]

[1]Zoological Institute, University of Cologne, Cologne, Germany;

[2] CONICET, Laboratorio de Entomología, Instituto Argentino de Investigaciones de las Zonas Áridas (IADIZA, CCT CONICET Mendoza), Mendoza, Argentina.

Darkling beetles belong to the most conspicuous biotic components in arid ecosystems worldwide. In the Atacama Desert, where free-living microbial decomposers are barely detectable, euryphagous tenebrionids are likely responsible for most of the nutrient cycling. The tenebrionids are adapted to the arid zones, presenting unique morphological features and they are very diverse in the deserts. Darkling beetles from the Atacama present numerous endemic genera and species. The many dry-wet phases have probably fragmented the suitable habitats and could have caused distinct diversification of this group. Thus, these animals are fascinating objects to study speciation events and population diversity. Faunistic and taxonomic studies of recent date on tenebrionids from this desert are based mainly on morphological characters and comprehensive studies on the genetic diversity of these organisms do not exist. For this reason, we initiated molecular phylogenetic and neuropeptide mass fingerprinting studies to unravel the systematic position and genetic diversity patterns of the tenebrionids from the Chilean Atacama Desert. We obtained preliminary and partially controversial results about the systematic position of subfamilies and tribes of tenebrionids. Finally, we report interesting taxonomic findings including a new species and a new genus of Tenebrionidae.

ABSTRACTS OF POSTERS

Tenebrionidae (Coleoptera) of forensic importance in Mendoza and Catamarca, Argentina: Their relationship to decomposition stages as complementary PMI indicators (p)

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Tenebrionidae have usually been reported in forensic studies on human corpses during decomposition but are not frequently used in forensic studies due to the lack of information on their biology and association with the decomposition stages. In this study we identified species of Tenebrionidae associated to corpses and examined their relationships to decomposition stages in pigs. We analyzed species preferences for different stages of decomposition and microenvironmental conditions (shade, sun). Darkling beetles specimens were collected during the entire decomposition process from carcasses of 12 pigs in the arid environment of Mendoza (32°53'53"S, 68°52'26"W, 850 m), during the four seasons of the year and two pigs and one llama in Catamarca (26°01'32"S, 67°20'36.5"W, 3600 m) just during spring. We collected 606 individuals belonging to 17 Tenebrionidae species, of which 590 individuals in Mendoza (467 in spring, 16 in summer, 73 in autumn and 34 in winter) and 16 Catamarca (16 spring). The greatest abundance and richness was reported to occur in both late Decay Advanced and mainly in Dry stages, in all seasons sampled seasons. Different tribes of Tenebrionidae were associated to the stage Dry for each season of the year: in Mendoza Epitragini (*Omopheres difficilis, O. scabripennis, Hemasodes minutus*) in spring; Opatrini (*Conibius franzi)* and Alphitobiini (*Alphitobius diaperinus)* in summer; Endrotini (*Hylithus tentyroides)* and Alleculini (*Lobopoda breyeri)* in autumn; Trilobocarini (*Salax lacordairei)* in winter; and in Catamarca Praociini (*Praocis ecostata*) and Scotobiini (*Leptynoderes strangulata*) in spring. The most abundant species at the sun was *S. lacordairei* while *Trichoton roigi* was at the shaded carcass.

A new species of *Discopleurus* (Coleoptera: Tenebrionidae: Pimeliinae), the first Stenosini from Brazil

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Discopleurus Lacordaire consists of six described species distributed in the Neotropical and Andean regions and in the South American transition zone. The species exhibit short-range distributions, except for *D. acuminatus* Reitter, 1886, which has a disjunct distribution, with records in Chile and Venezuela. The new Brazilian species of *Discopleurus* was collected in a cave-rich area, with extensively mining activities, within the third most populated metropolitan area of Brazil. Our aims in this work is to describe this new species of *Discopleurus*, which constitutes and the first report of the tribe Stenosini for Brazil. The new species most resembles *D. acuminatus*, differeing in the pedicelle twice as long as the funicule antenommeres, the subquadrate mentum, the more rounded head, the coarsely punctate metaventrite and in the shortest body (total length of 2.17 mm). The new Brazilian species and *D. acuminatus* differ from the other *Discopleurus* in the elytral keels equally elevated and the sutural area slightly elevated. Given the fact that the new species was found in a mining area, together with other important beetle species and the touristic potential of the cave system, efforts for the preservation of the area are being made.

New data on the behavior and morphology of species of the Neotropical genus *Nilio* (Coleoptera: Tenebrionidae: Nilioninae) (p)

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Nilio Latreille, 1802 is the only representative of the Neotropical subfamily Nilioninae, comprising 42 extant and one fossil species. *Nilio* is divided into three subgenera, defined mostly by the number or lack of elytral striae: *Nilio* Latreille, 1802, *Linio* Mader, 1936 and *Micronilio* Pic, 1936. Little is known about the behaviour and general biology of *Nilio* species, and immature stages have been seldom studied. In our field observations and in data provided in the scientific literature, species of *Nilio* have been observed in dead or live trunks, probably feeding on fungi, usually on lichens; and they can be observed throughout the day and exhibiting gregarism. In recent field collections in a remnant of the Atlantic Forest biome in Southeast Brazil, we observed solitariness in *N.* (*Linio*) *maculatus* Germar, 1824. But larvae and adults of *N. maculatus* occurred usually alone over trunks late at night; when two individuals occurred at the same trunk, no explicit interactions between them was observed. When disturbed, both adults and larvae of *N. maculatus* head towards the leaf litter. In contrast, the gregarious *Nilio* species remain motionless. The larva of *N. maculatus* is also new to science and will be described by us in a forthcoming work. Additionally, in *Nilio* (*Micronilio*) sp., probably new to science, we observed sexual dimorphisms not recorded for the genus: the protarsomere of males are pectinate and may help in the copula; and the fifth

abdominal ventrite is notched in males, possibly to allow the extrusion of the oddly shaped aedeagus.

Synopsis of the American *Neomida* (Coleoptera: Tenebrionidae: Diaperini)

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Species of the genus *Neomida* Latreille, 1829 are strict fungivorous beetles that dwell in hard conks of Polyporales and Hymenochaetales hosts. *Neomida* has approximately 50 described species, most from tropical and subtropical regions. In America, the genus is most diversified in the neotropics. It does not occur in the Andean region, and has only three species extending to the Nearctic region: *N. bicornis* (Fabricius), *N. occidentalis* (Champion) and *N. ferruginea* (LeConte). The use of characters of male and female abdominal terminalia is neglected within *Neomida*, and only *N. suilla* Latreille, 1829 has both male and female terminalia described. The use of characters of the female abdominal terminalia for taxonomy is almost restricted to diagnose higher taxa such as subfamilies, but it may provide new insights toward the classification within subfamilies, genera and even species. Our objective in the present work is to provide a synopsis on the American *Neomida*, including description of new species, data on geographic distribution and host fungi of species, and a provisional identification key for males and females. We also provide information on the morphology of male and female abdominal terminalia whenever possible and briefly discuss their importance in the taxonomy of the genus. We analyze almost all species that occur in the American continent and recognized a good set of characters of female abdominal terminalia, which proved to be important in delimiting and recognizing *Neomida* species; in some cases, being even more informative than characters of the aedeagus. Without information on the female terminalia, only males would be accurately identified. We think that characters of the female abdominal terminalia will help to solve problems on the taxonomy and phylogeny of Diaperinae. Therefore, it is necessary to conduct a robust comparative morphological study of female terminalia in the subfamily, which is already being worked by us.

Cytogenetics of *Turkonalassus quercanus* (Tenebrionidae, Helopini)

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Cytogenetic features of the endemic Western Anatolian species *Turkonalassus quercanus* belonging to newly formed genus *Turkonalassus* (Keskin, Nabozhenko, Alpagut-Keskin, 2017) were analysed using conventional and differantial staining. The chromosome preparations were obtained from the gonads of males using Murakami and Imai's (1974)

splashing method with some modifications. The slides were stained with 4% Giemsa for standard staining. The silver impregnation technique of Patkin and Sorokin (1984) was performed to determine the possible NOR regions. The mitotic and meiotic plates were analysed and photographed with Zeiss Axio Scope light microscope using ZEN software. Diploid chromosome number of *Turkonalassus quercanus* was determined as 2n=20 which is considered modal number for Tenebrionidae. Karyotype and idiogram of *T. quercanus* obtained from a female specimen.

Species diversity of Tenebrionidae in mountaintops of extraandean volcanoes of Payunia (Argentina), with descriptions of two new species

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The north of Neuquén province shares with the south of Mendoza province the district Payunia of the Patagonic steppe, which is characterized by the presence of approximately 800 volcanoes. In this work we reported the results of two consecutive years of prospection in high elevational environments of two extraandean volcanoes that are separated by 120 km of distance each other, Tromen (3978 msnm) and Auca Mahuida (2214 msnm). We found that Auca Mahuida harbours a total diversity of 10 tenebrionid species and Tromen 9, with 0.18 percent of species shared between them (Jaccard index of similarity). Two new microendemic species of Tenebrionidae are described: *Scotobius* sp. nov. (Tenebrioninae: Scotobiini) from Auca Mahuida and *Psectrascelis* sp. nov. (Pimeliinae: Nycteliini) from Tromen. Photographs for these two new species are included, with comparisons to other known species of these genera. The presence of endemic species of volcanoes occurs in other isolated mountains of Payunia and could be the result of particular habitat condition and isolation that drives the evolution of new species. Also isolation between both mountains could be the reason of low similarity of epigean tenebrionds.

The role of tenebrionid beetles on litter fragmentation processes and soil biogeochemical cycles in arid Patagonia

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Tenebrionid beetles are among the most abundant and diverse insects of arid environments. They are considered mostly detritivores and given their multiple physiological and behavioral adaptations, they might play an important role on biogeochemical cycles in these environments. However, in South America, there are few or no studies that has directly quantified or demonstrated this role. South America endemic species of the Nycteliini tribe (subfamily Pimelinae) are specially adapted to arid and semi-arid environments. Within this tribe, the genus Nyctelia dominates the fauna of Tenebrionidae in Patagonian steppes, being *Nyctelia dorsata* (Fairmaire) one of the main components of the epigean insect community of northeast of Patagonia. Due to their apterous condition *N. dorsata* distribution is restricted and It is frequently observed feeding on litter. The objective of this work was to evaluate the detritivore role of *N. dorsata* and its effect on soil N cycle throughout microcosms experiment. Collected Tenebrionids were fasted for 7 days before the experiment starts. Microcosms were subjected for 26 days to the following treatments: Soil with no litter (S); Soil + litter of one of the most important plant species on its diet (*Lycium chilense*) (SL) and Soil + litter (*Lycium chilense*) + *N. dorsata* (SLN). At the end of the experiment, litter mass loss and total soil N concentration were analyzed by GLM. Litter mass loss was significantly higher at SLN than at SL. Total soil N was higher at SLC than at SL and S while we found no differences between S and SL. We concluded that in Patagonian arid environments *N. dorsata* plays a key role in biological fragmentation processes of plant residues and soil biogeochemical cycles. Moreover, this role is particularly important in dry season, when soil microbial activity is reduced due to the harsh environmental conditions.

Spatial distribution of tenebrionid beetles in relation to environmental variability in Península Valdés, Patagonia

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Deserts provide atmospheric-climatic regulation and other several important ecosystem services that many human activities, through habitat degradation and species lost, could severely impact. A sustainable management of arid ecosystems is needed to prevent these undesirable consequences, and knowledge of biodiversity spatial patterns as well as understanding of their spatial distribution in relation to environmental and climatic factors are essential for this. The Natural Protected Area Península Valdés (PV) exhibits an important environmental variation which allows it to host a considerable biodiversity. Recently the knowledge of the terrestrial arthropods in PV have greatly increased, showing that tenebrionid beetles (Coleoptera: Tenebrionidae) are among the most abundant groups and species diverse insect. At the same time, it is known that these beetles are important for the functioning of desert ecosystems (eg. litter fragmentation processes and soil biogeochemical cycles). In this

work we study for the first time the spatial distribution of darkling beetles in relation to environmental variability in PV, identifying the most important species assemblages and the main environmental variables that determine them. Tenebrionid species records were compiled from own entomological collection trips, bibliography and from revision of national entomological collections. Habitat information was collected from bibliography and satellite images. Multivariate statistics evidenced that environmental variability within PV determines different assemblages of tenebrionid species into the region. Most important species that differentiate these assemblages were *Nyctelia picipes*, *Epipedonota cristallisata*, *Blaptinus punctulatus*, *Mitragenius araneiformis* and *Emmallodera hirtipes*. Main environmental determinants of their distributions were temperature, rainfall, slope, soil type, geomorphology and percentage of vegetation cover. Our findings contribute to the sustainable use of arid Patagonia and improve both future environmental classifications and predictions of biodiversity changes into the region.

Taxonomic significance of the ovipositor and female genital tubes in the genus *Blaps* Fabricius, 1775 (Coleoptera: Tenebrionidae) from the Caucasus.

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The taxonomy of the genus *Blaps* Fabricius, 1775 is difficult and complicated, the status of some species needs to be clarified. All modern keys to species consist of external morphological characters, so we use more stable taxonomic characters of internal morphology.

The structure of the male aedeagus is not reliable taxonomic character. The structure and the chaetome of ovipositors and the structure of female genital tubes are ofetn more taxonomically important. We allocated four types of ovipositors, each closely related with a structure of substratum, into which the female places eggs. The structure of the ovipositor has an adaptive character and poorly suited for phylogeny but can be widely used in taxonomic diagnostics of *Blaps*. The structure and the chaetome of the ovipositor are differ even on subspecies level (for example in *Blaps lethifera lethifera* and *Blaps lethifera pterotapha*). Diagnostics of species using the structure of female genital tubes is also effective for taxonomy and partly for phylogeny. There are many differences in the length of basal duct and accessory gland of spermatheca, and in the structure of reservoirs between species. We allocated five types of spermathecae using the length of the basal duct and the structure of reservoirs.

Therefore, ovipositors and female genital tubes of *Blaps* have a prospective importance in taxonomy and can be used to improve the system of the genus.

Revision of the genus *Calyptopsis* Solier, 1835 (Coleoptera: Tenebrionidae: Tentyriini): problems and progress in the taxonomy

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The genus *Calyptopsis* Solier, 1835 is a small group of wingless xerophilous tenebrionids of the tribe Tentyriini distributed in semideserts and xerophytic Mediterranean landscapes from Greece to Afghanistan. To the present time, 30 species of the genus are known and the largest species diversity of the group is observed in Iran (16 species). Different species of *Calyptopsis* inhabit mainly stony xerophytic areas in semideserts, mountain steppes and Mediterranean landscapes. The last revision of the genus was made at the end of the 19th century by Reitter. After that several species were described from Turkey, Iran, Afghanistan and the Caucasus. The problems in taxonomy of the genus are the poorly studied type material, unclear and variable diagnostic characters (sculpture of head, punctation of prothoracic hypomera, bordering of pronotum etc.) and unknown immature stages, bionomics and nutrition. Using additional characters (beading and punctation of abdominal ventrites and metaventrite, structure of prosternal process, male and female genitalia, sculpture of mesoventrite) significantly improved the species diagnostics. The study of immature stages, bionomics, nutrition of different species of genus *Calyptopsis*, morphological adaptations of these darkling beetles to arid landscapes can significantly improve our knowledges about this group.

A molecular phylogeny of Pedinini (Coleoptera: Tenebrionidae) and its implications for higher-level classification

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The first comprehensive molecular phylogeny of a darkling beetles tribe Pedinini is inferred from analysis of DNA sequence data from the six following loci: 28S rRNA (D1 to D3 and D4 to D5 regions), cytochrome c oxidase II (COII), wingless (wg), CAD/rudimentary (CAD2), and arginine kinase (ArgK). The Bayesian inference, maximum likelihood and maximum parsimony analyses included 79 species, representing all seven pedinoid subtribes. Representatives of the tribes Amphidorini, Blaptinini and Helopinini were used as outgroups. The results reveals that Pedinini is paraphyletic in regard to Helopinini. On the other hand, monophyly of the majority of the subtribes (except Melambiina) is supported. The existence of three main clades is recovered: 'Dendaroid' (Dendarina and Melambiina), 'Pedinoid' (Helopinini, Leichenina, and Pedinina) and 'Platynotoid' (Eurynotina and Platynotina). A new classification of the studied tribe is proposed. In order to restore the monophyly of Pedinini the taxonomic rank of Helopinini is lowered to the subtribal level, while the names of the previously designated subtribes are synonymized with the nominal

one, and such taxonomic entity is absorbed within Pedinini [Helopinina (=Aptilina syn. nov. ; =Micrantereina syn. nov. ; =Oncosomina syn. nov.)]. Pythiopina is considered as a synonym of Dendarina [Dendarina (=Pythiopina syn. nov.)]. The genus *Phylacinus* is transferred from Melambiina to Dendarina.

Phylogeography of *Odocnemis aegaeica* Nabozhenko et Keskin, 2016 species group

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Odocnemis aegaeica Nabozhenko et Keskin, 2016, *Odocnemis seducta* Nabozhenko et Keskin, 2016 and *Odocnemis euritopica* Nabozhenko et Keskin, 2016 are closely related species, distributed in Western Anatolia. They are found in subalpin zones of high mountain areas. In this study; phylogram generated with RaxML analysis obtained from mtDNA cox1 and nDNA Mp20 gene regions is built on Western Anatolia map using GenGIS program. It is possible to evaluate phylogenetic analyses with a zoogeographical point of view. Even though *O. euritopica* has a wide distribution, individuals collected from different locations are seen in the same lineage.

Biotic and abiotic factors that influence the biodiversity patterns of Tenebrionidae in the Puna and High Andes of the province of Salta, Argentina

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Studies of biodiversity in the desert and semi-desert environments are very interesting because the associated fauna to these environments exhibits significant morphological, physiological and behavioural adaptations to allow their development in these extreme habitats. In the province of Salta, two high altitude ecoregions are well represented, Puna and High Andes, considered as priority conservation areas included in the Global 200 as vulnerable. We studied tenebrionids of Puna and High Andean ecoregions in Salta province to compare the alpha and beta diversity between them and the regional gamma diversity with the purpose to identify the possible environmental factors that may influence their diversity

patterns. Two samplings (2014-2015) were carried out in 30 sites (12 in High Andes and 18 in Puna), using pitfall traps and G-Vac (suction samples) over the vegetation and we measured several environmental variables related with soil, climate and local vegetation. Two hundred and seventy individuals were collected (21 species, 11 genera, 8 tribes and 2 subfamilies). The results showed that there are no significant differences in the tenebrionid species richness between these two ecoregions, but both differ in their composition and the number of endemic species. The greatest contribution to the gamma diversity of tenebrionids is given by the diversity between sites and the ecoregional beta diversity, indicating that the heterogeneity at multiple scales is crucial for the maintenance of the regional biodiversity. The diversity patterns of tenebrionids in these two ecoregions are mainly influenced by the geographic distance, which in turn exerts an effect combined with environmental variables.

New species of *Schizaraeus* Kulzer from Peru (Pimeliinae: Stenosini)

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The tribe Stenosini is composed of small species with pantropical distribution, often associated with ants, rodent nests and soil. In South America it is represented by the genera *Grammicus* Waterhouse, *Ecnomoderes* Gebien, *Renefouqueosis* Aalbu et al., *Schizaraeus* Kulzer (subtribe Stenosina) and *Discopleurus* Solier and *Hexagonochilus* Solier (subtribe Dichillina). Prior to this study, *Schizaraeus* is monotypic with one species, *S. acuticosta* from Catamarca, Argentina. In this contribution we describe a new species of *Schizaraeus* from southern Andes of Peru. SEM photographs for the new species are included, with comparisons to the other known species of these genera. A map including new records of the known species and the new one is presented.

Female genital tubes in the tribe Helopini: structure and taxonomic significance

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Female genital tubes in darkling beetles of the tribe Helopini very diverse and can belong to different morphological types according to the scheme of phylogeny by Tschinkel & Doyen (1980): tenebrionine, eleodine, lagriine (multiple bursa-derived spermatheca), and also several not presented types. In total, female genital tubes demonstrate two main lineages of Helopini: 'cylindrinotine' (spermatheca with single tube) and 'helopine' (spermatheca with two or more branched tubes) according to two subtribes Cylindrinotina and Helopina, but with but with

exceptions. 'Nalassoid' type with short not brunched spermatheca, absent basal duct and short accessory gland is the most primitive. The increase of the volume of the genital tubes is achieved by short processes (*Odocnemis*, *Cylindrinotus*, *Pseudoprobaticus*, *Nalassus* (*Helopondrus*), additional reservoirs in the base of spermatheca (*Pseudoprobaticus*, some *Odocnemis*), branched or multiple ducts (subtribe Helopina, *Eustenomacidius* (*Caucasohelops*)), presence of secondary bursa copulatrix (*Xanthohelops*). Two genera (*Helops* and *Nesotes*) have one way valve between spermatheca and accessory gland. Some species of the genus *Hedyphanes* have two accessory glands and sclerotized vagina. *Xanthomus* has secondary bursa copulatrix. Two genera (*Hedyphanes* and *Entomogonus*) have multiple bursa-derived spermatheca of adeliine type. Such diversity reduces the taxonomic significance of genital tubes within Tenebrionidae.

Cytogenetics of *Helops glabriventris* (Tenebrionidae, Helopini)

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Genus *Helops* s. str. Fabricius, 1775 (Tenebrioninae: Helopini) is known to have five species from Turkey: *Helops caeruleus stevenii, H. rossii, H. glabriventris glabriventris, H. cyanipes, H. punctatissimus.* All species of *Helops* mentioned as lichenophagous beetles which means that they feed on epiphytic foliose and fruticose lichens. The chromosomes of *Helops* have not yet been studied. On the other hand chromosomal information about tribe Helopini are only known for eight species.

In this study, with the aim of providing first cytogenetic information about genus *Helops*, chromosomal features of 4 male and 1 female *H. glabriventris* specimens from Western Anatolia were analysed using conventional and differential staining. The chromosome preparations were obtained from the gonads of males using Murakami and Imai's (1974) splashing method with some modifications. The slides were stained with 4% Giemsa for standard staining. The silver impregnation technique of Patkin and Sorokin (1984) was performed to determine the possible NOR regions. The mitotic and meiotic plates were analysed and photographed with Zeiss Axio Scope light microscope using ZEN software.

Diploid chromosome number of *H. glabriventris* was determined as 2n=20 with $9+Xy_p$ meioformula. The parachute formation of sex bivalents was clearly observed in metaphase I plates. NOR and heterochromatin distribution was determined with differential staining. As a result of silver staining, highly impregnated area associated with one of the middle-sized chromosome pair was observed in prophase I and metaphase I plates. Heterochromatin mainly distributed uniform along the chromosomes.

Revision of the genus *Diastoleus* Solier, 1838 (Tenebrioninae: Scotobiini)

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The genus *Diastoleus* Solier belongs to the Scotobiini, a Neotropical tribe of Tenebrioninae, with six genera endemic to arid and semiarid lands of South America. *Diastoleus* species are distributed in northern and central Chile and are characterized by having the lateral margin of pronotum broadly expanded and recurved upright, anterior margin with a deep and narrow incision, with eye and antennal base hidden when viewed from above. Prior to this study *Diastoleus* comprised three species. In this contribution the genus is revised with descriptions of new characters as internal skeletal anatomy and genitalia, which have higher taxonomic value. A new species is described and a specific dichotomous key is presented. Photographs of habitus and pronota and illustrations of internal skeletal anatomy are included. Comparisons to other genera of the tribe through of cladistics analysis are made.

Taxonomy of the genus *Strongylium* from Tibet, with the description of two new species (Coleoptera: Tenebrionidae)

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Two new species of *Strongylium* Kirby, 1819, *S. zayuicum* sp. nov. and *S. medogense* sp. nov., are described and illustrated from Tibet. Another four species of this genus are recorded from China for the first time: *S. gardneri* Blair, 1930, *S. martensi* Masumoto et Schawaller, 2010, *S. sobrinum* Dohrn, 1880, *S. westermanni* Maklin, 1864 all from Tibet. A poorly known species, *Strongylium thibetanum* Pic, 1916 is redescribed. Habitus and male genitalia of the newly described species are photographed.

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