Zitteliana

An International Journal of Palaeontology and Geobiology

Series B / Reihe B
Abhandlung der Bayerischen Staatssammlung für Paläontologie und Geologie

International Conference on Ruminant Phylogenetics Munich 2013

03.—06. September 2013
Programme and Abstracts

Munich 2013
Zitteliana
An International Journal of Palaeontology and Geobiology

Series B/Reihe B

Abhandlungen der Bayerischen Staatssammlung für Paläontologie und Geologie

31

International Conference on
Ruminant Phylogenetics Munich 2013

03.-06. September 2013

Programme and Abstracts

Munich 2013

Zitteliana B 31 48 Seiten München, 01.09.2013 ISSN 1612-4138
<table>
<thead>
<tr>
<th>Time</th>
<th>Speaker</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>11:00 am - 11:20 am</td>
<td>Theodor</td>
<td>Basicranial and ear morphology characters among basal ruminants</td>
</tr>
<tr>
<td>11:20 am - 11:40 am</td>
<td>Métails</td>
<td>Eocene-Oligocene selenodont artiodactyls from Asia and their bearing on the phylogeny and paleobiogeography of early ruminants</td>
</tr>
<tr>
<td>11:40 am - 12:00 pm</td>
<td>Mennecart</td>
<td>Reassessment of early European Ruminantia: implications for the diversity and evolution of the group</td>
</tr>
<tr>
<td>12:00 pm - 12:20 pm</td>
<td>Barry</td>
<td>The fossil tragulids of the Siwalik Formations of southern Asia</td>
</tr>
<tr>
<td>12:20 pm - 12:40 pm</td>
<td>Sánchez</td>
<td>Phylogeny of the Tragulidae (Mammalia, Cetartiodactyla, Ruminantia)</td>
</tr>
<tr>
<td>12:40 pm - 1:00 pm</td>
<td></td>
<td>Group picture</td>
</tr>
<tr>
<td>1:00 pm - 2:20 pm</td>
<td></td>
<td>Lunch break</td>
</tr>
<tr>
<td>2:20 pm - 2:40 pm</td>
<td>Aiglstorfer</td>
<td>New insights into tragulid phylogeny of Europe: <em>Dorcatherium nani</em> from the latest Middle Miocene of Austria</td>
</tr>
<tr>
<td>2:40 pm - 3:00 pm</td>
<td>Lister</td>
<td>Systematics of the endemic Pleistocene deer of Mediterranean islands</td>
</tr>
<tr>
<td>3:00 pm - 3:20 pm</td>
<td>Azanza</td>
<td>Fossil taxa and molecular clock calibrations in Cervidae phylogeny: the challenge of the middle-late Miocene muntjac-like deer</td>
</tr>
<tr>
<td>3:20 pm - 3:40 pm</td>
<td>Heckeberg</td>
<td>A revision of cervid phylogeny using a total evidence approach</td>
</tr>
<tr>
<td>3:40 pm - 4:00 pm</td>
<td>Schulz</td>
<td>Separating phylogenetic signals from trophic convergence in cervid dentition – implications from tooth morphology and 3D surface texture analysis</td>
</tr>
<tr>
<td>4:00 pm - 4:20 pm</td>
<td>Zhang</td>
<td>Late Miocene <em>Cervus novorossiae</em> (Cervidae, Artiodactyla) from Lantian, Shaanxi Province</td>
</tr>
<tr>
<td>4:20 pm - 4:50 pm</td>
<td></td>
<td>Coffee break</td>
</tr>
<tr>
<td>4:50 pm - 5:10 pm</td>
<td>Ghaffar</td>
<td>Fossil remains of family Cervidae from the Siwaliks of Pakistan</td>
</tr>
<tr>
<td>5:10 pm - 5:30 pm</td>
<td>Croitor</td>
<td>Deer from Plio-Pleistocene of Western Eurasia: matching fossil record and molecular phylogeny data</td>
</tr>
<tr>
<td>5:30 pm - 5:50 pm</td>
<td>van der Geer</td>
<td>Morphology of articular surfaces can solve a phylogenetic issue: one instead of two ancestors for <em>Candiacervus</em> (Mammalia: Cervoidea)</td>
</tr>
<tr>
<td>5:50 pm - 6:10 pm</td>
<td>Doan</td>
<td>Extinction-recolonization events in Crimean red deer populations during Late Pleistocene</td>
</tr>
<tr>
<td>6:10 pm - 6:30 pm</td>
<td>Kubo</td>
<td>Geographic variation in body size of Japanese sika deer: Bergmann’s rule revisited</td>
</tr>
</tbody>
</table>
Basicranial and ear morphology characters among basal ruminants

Jessica M. Theodor

University of Calgary, Canada; jtheodor@ucalgary.ca

The modern family Tragulidae is often regarded as a primitive archetype for the earliest ruminants, as these are generally small-bodied selenodont taxa lacking cranial appendages. As a result, the basal ruminants have, until fairly recently, been placed within the Tragulina with little regard for the relationships among them, their monophyly or their morphological diversity. Increased diversity of Asian material and more explicit phylogenetic work has generated several testable hypotheses of relationship among basal ruminants, suggesting that the groups’ ultimate origins are Asian, and the North American families, the Hypertragulidae and Leptomerycidae evolved independently from within Asian clades, immigrating separately to North America.

One current hypothesis unites the North American hypertragulids with the Asian praetragulids, as a basal offshoot of ruminants, but of the seven features suggested to unite them, only two (medial concavity of the posterior palate, and a high degree of variability (such as bullar morphology which is highly variable in early ruminants), while others can be argued to support this hypothesis. The occipital exposure of the mastoid, a feature of bachitheriids, archaeomerycids, gelocids, and leptomerycids; the closed postorbital bar, is present in bachitheriids, archaeomerycids, leptomerycids, and gelocids, and presumably evolved convergently among tragulids.

Many of the cranial characters do not clearly support this hypothesis. The shallow subarcuate fossa is shared by gelocids and Pecora. Anterior displacement of the stapedial muscle fossa is known in hypertragulids, leptomerycids and tragulids, which suggests a possible functional component driving parallel evolution. The enlarged, subcentral tympanohyal vagina is known in archaeomerycids and leptomerycids, but remains unknown for others. Detailed high-resolution CT of the ear region of Hypisodus shows a mix of derived and ancestral features. The medial petrosal carries the basioccipital groove, unlike other ruminants; the deep subarcuate fossa contains a large mastoid fossa within it, also known in basal tymlopods. However, it also bears a sharp crest on the medial petrosal, a feature of more derived ruminants, raising the question of whether the degree of inflation of the bulla is correlated. Additional information remains to be identified using high-resolution CT studies; many basal artiodactyl taxa have recently been described using these techniques to better understand basicranial and petrosal features, and better documentation of basal ruminant taxa may allow considerable improvement in resolution by clarifying character states and homology assessments.

Morphology of articular surfaces can solve a phylogenetic issue: one instead of two ancestors for Candiacervus (Mammalia; Cervoidea)

Alexandra A. van der Geer1, George Lyras2, John de Vos1, Hara Drinia2

1Naturalis Netherlands Biodiversity Center, Leiden, The Netherlands; 2National University of Athens, Greece;
alexandra.vandergeer@naturalis.nl

During the Late Pleistocene, the insular deer of Crete underwent cladogenesis in isolation as a result of which it is represented by six to eight species (depending on the taxonomy followed). The body size range from the smallest (about 22 kg) to the largest species (about 316 kg) is impressive. For decades, this unusual broad range has given rise to much debate concerning the process of speciation. Two alternative hypotheses have been proposed. One assumes two invasions, expressed in various generic names for the different species (e.g. Praemegaceros for the smaller, and Leptocervus or Pseudodama for the larger species) and thus making the Cretan deer a polyphyletic group. The other hypothesis assumes one invasion and a subsequent evolutionary radiation or cladogenesis. In that view, the Cretan deer form a monophyletic group. Until now, this issue could not be satisfactorily solved because of the lack of any cranial and dental remains of the two largest species. Recent morphological and functional analysis of the articulations of the limb bones sheds new light on this issue. We found that both shape and absolute size of some articulations and the morphology of the vertebrae are remarkably similar among the size classes, suggesting a common origin for all species of Cretan deer. In particular, the limb bones of both dwarf and giant representatives of the Cretan deer deviate morphologically from those of similar-sized mainland deer, including their ancestors. The result is massive bones with
broad joints in the dwarf species and very slender bones with narrow joints in the giant species, whereas this is opposite in the mainland species when we disregard length. To conclude, this means firstly that the ancestor of the Cretan deer species must have had a morphology in between that of the dwarfed and giant species and secondly, that the Cretan deer are mono-phyletic and thus the name Candiacervus applies to all six or eight species, which are now sister species. Since, concerning the postcranial skeleton, the least derived Candiacervus species is the Dama-sized C. cretenis, we suggest that the most likely sister species to all Cretan deer is a mainland deer of that size. Candiacervus shares many characters with Dama and Megaloceros but most characters that distinguish these two genera are polymorphic in Candiacervus and can thus not be used. Based on size alone, we tentatively suggest Dama as ancestral to Candiacervus.

This research has been co-financed by the European Union (European Social Fund – ESF) and Greek national funds through the Operational Program ‘Education and Lifelong Learning’ of the National Strategic Reference Framework (NSRF) - Research Funding Program: THALIS –UOA- Island biodiversity and cultural evolution: Examples from the Eastern Mediterranean, Madagascar, Mauritius and Philippines during the past 800,000 years.

Late Miocene Cervavitus novo-rossiae (Cervidae, Artiodactyla) from Lantian, Shaanxi Province

Lihua Wang, Zhaoqun Zhang

Chinese Academy of Sciences, Beijing, China;
wanglihua131@gmail.com

Fossil deer from the base of the Lantian Formation, Shaanxi Province, are described and assigned to Cervavitus novo-rossiae by its size, three-tined antlers, curved development of the beam, laterally flattened fork, long and curved brow tine, pedicles prolonged by a ridge on the frontals, the long span between the burre and first fork in young individuals etc. Palaeomeryx-folds on lower molars are present in European specimens but generally undeveloped or missing in Chinese ones. New biochronological data suggests the possible origination of Cervavitus in Europe, and subsequent migration to China. The differences of C. novo-rossiae with C. shanxius (Teilhard de Chardin and Trassera, 1937; Dong and Hu, 1994) show that C. novo-rossiae might evolve into the latter in order to adapt to climatic and environmental changes. Overview of the plicocervines from China confirms five species of Cervavitus existed in China: C. novo-rossiae Khomenko, 1913, C. shanxius Dong & Hu, 1994, C. huadeensis Qia, 1979, C. ultimus Lin, Pan & Lu, 1978, and C. fengii Han, 1987.

The anatomy and paleoecology of the boselaphine Miotragocerus pannoniae from the late Miocene Höwenegg locality (Hegau, Germany)

Dominik Wolf1, Raymond L. Bernor2, Gina M. Semprebon3

1Forschungsinstitut und Naturmuseum Senckenberg, Frankfurt am Main, Germany; 2Howard University, Washington, DC, U.S.A.; 3Bay Path College, Longmeadow, MA, U.S.A.; d_wolf_palaeo@yahoo.de

While the basal Boselaphini (or Tragoportacini) are known to be represented by a number of taxa in the late Miocene of Europe, the poor state of preservation of most early boselaphine remains makes it difficult to taxonomically define species and assess phylogenetic relationships among members of this tribe. Especially the interrelationships between two dominant genera in this context, Miotragocerus and Tragoportax, are poorly understood.

In contrast to most other late Miocene European fossil sites, the southern German Höwenegg locality (10.3 Ma; MN9) is known for the exceptional preservation and completeness of its numerous skeletons of various large mammals. Being represented by 24 complete or near-complete skeletons at present, Miotragocerus pannoniae is the most common mammal at this locality. No detailed description of the anatomy of Höwenegg Miotragocerus has as yet been published. This is surprising, given the sample’s potential for helping in circumscribing the thus far proposed species of Miotragocerus as well as in taxonomically re-evaluating material allocated to other early boselaphines. A matter of particular interest in this regard is sexual dimorphism as evident in horn core morphology, given that such intraspecific variability causes much taxonomic confusion at localities where only disarticulated early bovid specimens are found.

Four recently discovered and prepared Höwenegg Miotragocerus skeletons housed in the Natural History Museums of Stuttgart and Karlsruhe have now been described in detail and compared to the remaining boselaphine material from this locality. In doing so, metric data for nearly all skeletal elements could be obtained. Furthermore, all currently accessible horn cores of Höwenegg Miotragocerus, some of which can securely be tied to female individuals in association with fetuses, were investigated. Measurements of horn core dimensions as well as morphological observations allowed the development of a thorough understanding of the extent and nature of cranial sexual dimorphism in this taxon. Our anatomical observations will aid in identifying morphological characters useful for future phylogenetic analysis of basal boselaphines.

We also analyzed the paleodiet of Höwenegg Miotragocerus using microwear and mesowear methods in order to assess the paleoecology of this species in particular and of the Höwenegg environment in general. The assessment generally indicates a browse-dominated diet for this boselaphine. Interestingly, while this is also true for the Höwenegg hipparion, Hippotherium primigenium, these equids must have preferred a diet slightly richer in grass, as is evident in the results of our microwear analysis. Further analysis of the functional anatomy of Höwenegg Miotragocerus based on postcranial elements will provide additional information on this boselaphine’s paleoecology.