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# Palaeontological Society of Southern Africa - 15th Biennial Meeting, Grahamstown, 2006 - Additional Abstracts

**Various**

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## Palaeontological Society of Southern Africa – 15th Biennial Meeting, Grahamstown, 2006

**Additional abstracts**

The following three abstract were inadvertently omitted from the list of abstracts published in *Palaeontologia africana* (2007) **43**, 117–136.

# Papers

### Evolution in action: documenting hybridization in wildebeest

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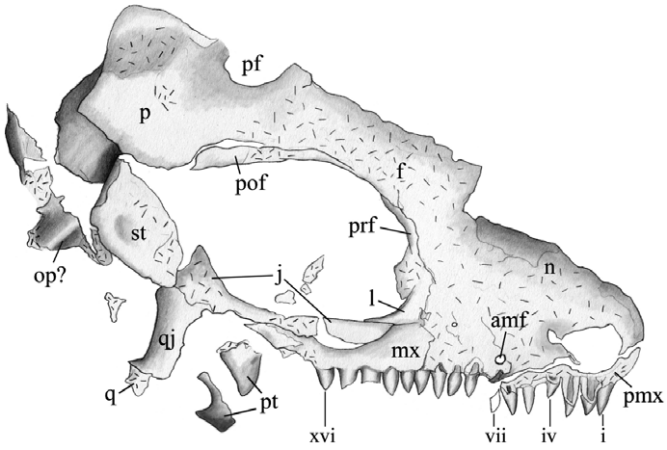
Wildebeest form part of the tribe Alcelaphini and the genus *Connochaetes*. There are two extant species, namely *Connochaetes gnou* (black wildebeest) and *Connochaetes taurinus* (blue wildebeest). From fossil evidence, it is thought that black wildebeest evolved from a blue wildebeest-like ancestor *c.* 1.0 ma ago. Genetic evidence also suggests that the two species of wildebeest diverged in a time less than 1.0 ma. Historically, geographic ranges of these two species have overlapped, but different social behaviour and habitat preferences prevented interbreeding. Black wildebeest, the derived form, is permanently territorial and needs open habitat in order to visually patrol and maintain breeding territories, while blue wildebeest has a flexible reproductive behaviour in being able to reproduce in open grasslands or wooded environments without necessarily occupying territories. It has been proposed that reproductive isolation between *C. taurinus* and *C. gnou* may have been disrupted due to management practices, such as the spatial confinement of black and blue wildebeest within fenced areas and in sub-optimal habitat. This would affect the process of mate selection and allow for interbreeding. Although genetic studies have shown that the blue wildebeest populations are generally 'pure' and that the black wildebeest populations are receiving an influx of blue alleles because of hybridization, the inverse can occur, where black wildebeest males interbreed with blue wildebeest females. In this research, 13 specimens selected at random from a population suspected to be *Connochaetes taurinus* × *Connochaetes gnou* hybrids from the Spioenkop Nature Reserve, KwaZulu-Natal, have been studied. The aim of this project is to test whether a comparative osteological approach can successfully identify hybrids. To this end, hybrid data will be compared, morphologically and statistically, with results from a large reference sample of pure blue and black wildebeest.

### New procolophonid parareptile from the Katberg Formation (*Lystrosaurus* Assemblage Zone, Lower Triassic) of South Africa

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Here a new genus and species of procolophonid is reported. The specimen consists of a partially articulated




skeleton that was collected in the uppermost levels of the *Lystrosaurus* Assemblage Zone, in South Africa (Lower Triassic). The new taxon co-occurs with the well known form *Procolophon trigoniceps*. The cranium of BP/1/1187 (see figure below) displays some primitive features such as a high number of teeth (16 upper marginal teeth) and the lack of quadratojugal spikes, but it possesses derived characters such as the presence of bicuspid teeth. The new taxon is unique in having seven long conical teeth, with the tips slightly recurved, and nine smaller molariform teeth. The dentition is suggestive of insectivorous habits.

The phylogenetic interrelationships of procolophonid reptiles were determined via a comprehensive cladistic analysis using a data matrix of 22 taxa and 66 characters. Besides the new taxon, several other taxa were included for the first time in a phylogenetic analysis, and most of the characters are novel. Information from North American, South American, South African, Chinese and Australian taxa was based on first hand examination. The analysis was performed with the program *Tree Analysis Using New Technology* (TNT) (Goloboff *et al.* 2003). A single most parsimonious tree was found by TNT. The results show that Procolophonidae is a monophyletic group. The new taxon is a basal form, being the sister group of all procolophonoids to the exclusion of the owenettids, *Coletta seca* and *Sauropareion anoplus*. Character optimization indicates that bicuspid teeth were acquired independently by the new taxon, therefore originating twice in the Procolophonidae.

**Reference**

Goloboff, P.A., Farris, J.S. & Nixon, K.C. 2003. *T.N.T.: Tree Analysis Using New Technology.* Available at http://www.zmuc.dk/public/phylogeny

### A remarkable Latest Permian autochthonous flora from Wapadsberg Pass, southern Karoo Basin of South Africa

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A recent investigation of the well-known Permian-Triassic section at Wapadsberg Pass in the Eastern Cape has led to the discovery of two new autochthonous plant fossil localities. The two exposures probably represent the same fossiliferous horizon outcropping along the new

and old roads through Wapadsberg Pass, and have been correlated to within 10 m across the 1.5 km that separates them. The plant-fossil-bearing horizon is approximately 70 m below the P/T boundary in this area.

The basal 30 m of section along the new road through Wapadsberg Pass consists of fining upwards sequences in which coarse-to-fine siltstone overlies thin sheet sandstone bodies of very fine-to-fine grain size. Sandstone bodies may be imbricated within channel-form geometries, and represent lateral accretion beds within larger channels. Generally, overlying the coarse siltstone is the subsequent channel fill, with other siltstone facies indicative of overbank and interfluve deposits. Pedogenesis of the siltstones is evidenced by the presence of rhizoconcretions and early diagenetic calcareous nodules. One fining upward sequence is capped by a poorly developed paleosol with vertically oriented roots above which fossil plants are preserved in a silty claystone that coarsens to a siltstone.

The flora is represented by impressions within and above an inceptisol (?gleysol) horizon. Plant parts within the paleosol include large *in situ Vertebraria* axes and degraded aerial detritus. Assemblages above paleosols consist of well-preserved aerial debris and ground cover plants concentrated in mats with little intervening sediment between plant parts. These are interpreted to be a leaf litter (O) horizon. Aerial debris becomes less concentrated and more dispersed towards the top of the fossiliferous horizon and represents contribution during aggradation of the landscape. To date, no evidence of erect vegetation has been found in the limited exposures. At least two species of *Glossopteris* leaves, several seed types, and the glossopterid fertile structures *Lidgettonia* sp. and *Eretmonia natalensis* represent contribution from canopy vegetation. Two sphenophyte taxa, *Phyllotheca australis* and *Trizygia speciosa*, associated with sphenopsid cones are found in abundance and represent contribution from ground cover plants. The *Glossopteris* leaf impressions provide abundant evidence of plant–insect interactions, including margin- and hole-feeds, and oviposition scars.

This report represents the first account of a typical Late Permian flora, and the first collection of fertile glossopterid material of any age, from the southern Karoo Basin. Previously, *T. speciosa* had been recorded only as a relatively rare element in the Upper Permian Estcourt Formation floras of the northeastern Karoo Basin, KwaZulu-Natal, and at the Middle to Upper Permian Lawley locality in the northern Karoo Basin. The quality of preservation and abundance of this taxon at Wapadsberg Pass is exceptional.

These findings challenge current perceptions about the quality, abundance, and temporal distribution of fossil floras in the Karoo Supergroup. The role of fossil plants in biostratigraphic studies of the basin has been greatly underestimated in the past. Methodical investigation and accurate characterisation of the floras near the Permian–Triassic boundary can make a significant contribution to our understanding of hypotheses focused on this critical time interval in Earth history.