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The first dsungaripterid pterosaur from the Kimmeridgian of Germany and the biomechanics of pterosaur long bones

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A partial vertebral column, pelvis and femora of a newly discovered pterosaur are described. The remains from the Upper Jurassic (Kimmeridgian) of Oker (northern Germany) can be identified as belonging to the Dsungaripteridae because the cross-sections of the bones have relatively thick walls. The close resemblance in morphology to the Lower Cretaceous Dsungaripterus allows identification of the specimen as the first and oldest record of dsungaripterids in Central Europe. Furthermore, it is the oldest certain record of a dsungaripterid pterosaur world wide. The biomechanical characteristics of the dsungaripterid long bone construction shows that it has less resistance against bending and torsion than in non-dsungaripteroid pterosaurs, but has greater strength against compression and local buckling. This supports former suggestions that dsungaripterids inhabited continental areas that required an active way of life including frequent take-off and landing phases. The reconstruction of the lever arms of the pelvic musculature and the mobility of the femur indicates a quadrupedal terrestrial locomotion.

Key words: Reptilia, Pterosauria, Dsungaripteridae, locomotion, biomechanics, Jurassic, Germany.

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