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Constraining the age of the first pulse of continental rifting associated with the breakup of Pangea in Southwest Iberia

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The Algarve Basin is a Mesozoic sedimentary basin located in southern Portugal. The basin was initiated by rifting associated with the opening of the North and Central Atlantic Ocean during the initial breakup of Pangea. Sedimentation commenced with continental red beds, which unconformably overlie folded and faulted late Carboniferous strata. The red bed succession (Silves Sandstones) consists mainly of sandstones and conglomerates at the base, overlain by variegated mudstones interbedded with siltstones and dolomites (Silves Mudstones, Siltstones and Dolomites). The sandstones were deposited in alluvial environments, and the mudstones in alluvial to shallow lacustrine environments. Upper Triassic (Carnian to Norian) macrofossils are scarce in the red bed succession, occurring predominantly in the upper beds of the succession above the Silves Sandstones, and do not accurately constrain the age of the beginning of the Algarve Basin.

A palynological study of a new road cut outcrop of Silves Sandstones, located in central Algarve, was undertaken in order to ascertain its age. A 3 m thick bed of grey siltstones located ca. 2.5 m above the unconformity yielded age-diagnostic palynomorphs, which date the onset of sedimentation in the basin. Samples from the latter bed yielded a moderately well preserved, low diversity palynomorph assemblage, which is dominated by *Aulisporites astigosus*, *Convruccosporites* sp. and *Tulesporites briscoensis*. Other taxa present in the assemblage include *Alisporites* sp., *Calamospora* sp., *Cycadopites* sp., *Deltoidospora* sp., *Ovalipollis* cf. *ovalis*, *Triadispora* sp., and *Vallasporites ignacii*.

The dominance of *A. astigosus* together with *V. ignacii* is indicative of an early Carnian age based on comparison with independently dated sections described elsewhere in Europe. This new dating evidence thus constrains the beginning of sedimentation in the Algarve Basin to the earliest Late Triassic. The co-occurrence of *T. briscoensis* and *A. astigosus* suggests a mixing of palynofloral elements typical of North American and central European Carnian assemblages respectively, which is consistent with the intermediate position of Portugal between those regions. The dominance of phytoclasts and the absence of marine palynomorphs confirms a continental

depositional environment as also suggested by sedimentary lithofacies.

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