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Gyrochorte "highways" and their environmental significance in shallow-marine sediments

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The reworking of a trace by a subsequently following organism represents a so-called sequorichnial behavior and leads to formation of a "burrowing highway". Burrowing highways occur more frequently than assumed in the fossil record. Their ichnological and sedimentological meaning is elucidated by using the trace fossil *Gyrochorte*. *Gyrochorte* producers exploiting sandy event beds tend to use "burrowing highways" in the same direction. Evidently, the *Gyrochorte* producers are thigmotactically highly sensitive as they can recognize a burrow produced by the same species because of the less densely packed grains, a somewhat increased mud content, and supposedly mucus segregated within the burrow. These changes make the reworking of pre-existing burrows energetically advantageous. However, in shallow-marine settings mucus is degraded rapidly and loose sediment consolidates in a short while. Therefore, the time to recognize a pre-existing burrow appears to be limited and a rather high number of organisms is a prerequisite for reutilization of a previous trace. "Burrow highways" potentially represent an additional criterion to characterize an opportunistic population strategy.

Key words: Polychaete, ichnology, behaviour, sequorichnia, Cretaceous, Argentina.

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