Teichichnus pescaderoensis – New Ichnospecies in the Neogene Shelf and Slope Sediments, California

Teichichnus pescaderoensis, eine neue Ichnospecies in den neogenen Schelf- und Hangsedimenten Kaliforniens

Robert J. Stanton Jr., College Station, and J. Robert Dodd, Bloomington

KEYWORDS: PALEONTOLOGY - ICHNOSPECIES - CALIFORNIA - NEOGENE

SUMMARY

Teichichnus pescaderoensis is a new ichnospecies from the Neogene of central and northern California. It is approximately an order of magnitude larger than previously described Teichichnus species. It occurs in Pliocene and Pleistocene siltstone and very fine sandstone that was probably deposited on the upper slope to outer shelf, but ranging into the middle shelf.

INTRODUCTION

Trace fossils are an important component of the paleontologic record in the Neogene marine strata along the Pacific coast in California and southern Oregon. This is particularly true for strata deposited in offshore environments, in which body fossils are commonly much less abundant than in shallower-water sediments. The trace fossil described in this paper is widely distributed in Pliocene strata in central and northern California, is distinctive because of its size, and appears to be both stratigraphically and environmentally restricted. The objective of this paper is to describe this trace fossil, its known stratigraphic and geographic distribution, and its inferred habitat, and to speculate on the organism which produced it.

Addresses: Prof. Dr. R. J. Stanton Jr., Department of Geology, Texas A&M University, College Station, Texas 77843, Prof. Dr. J. R. Dodd, Department of Geology, Indiana University, Bloomington, Indiana 47401, USA
SYSTEMATIC PALEONTOLOGY

Ichnogenus *Teichichnus* SEILACHER, 1955

*Teichichnus pescaderoensis* n. ichnosp.

(Plate 31/1-6)

**Diagnosis:** Long, straight full-relief unlined burrows, which are broadly U-shaped with elongate horizontal retrusive sections and short, generally poorly preserved vertical tubes (stacks) at either end of the horizontal tube. They are filled with vertically-stacked biolaminae that are concave upward in transverse burrow section and horizontal in longitudinal section. The burrow fill is different in texture and bedding than the surrounding sediment. The geometry of the trace is that of the genus *Teichichnus*. This species is distinctive because of its size. *Teichichnus* species described in the literature (e.g., FARROW 1966; SEILACHER 1955), are characteristically approximately one cm wide, a few cm high, and up to several tens of cm long. In contrast, burrows of *T. pescaderoensis* are seven to thirteen cm wide, seven to thirty-eight cm high, and as much as 120 cm long.

**Derivation of name:** From Pescadero Beach, California, where specimens are best preserved.

**Type locality:** Sea cliffs 1200 m north of the mouth of Butano Ck., San Mateo County, California.

**Holotype:** Plate 31, Fig. 1. The large size of the traces and the soft friable nature of both the sediment filling the borrows and the mudstone in which they occur preclude collecting whole specimens for museum storage. Samples of the filling sediment (TAMU 1057) and of the trace-sediment boundaries (TAMU 1058) serve as holotype material. This material is in the type collection of the Geology Department, Texas A&M University, College Station, Texas.

**Description:** The basic form of the trace is an elongate and relatively narrow horizontal retrusive borrow filled with laminated sediment, generally of very fine sandstone (Fig. 2). The surrounding strata are predominantly clayey very fine sandstone to siltstone. The structure formed by progressive upward excavation and back filling of the horizontal passageway is all that is generally preserved. Vertical shafts extending from the ends of the horizontal burrow upward to the depositional surface are rarely preserved or evident on the outcrop. Most outcrop exposures are of densely packed overlapping and cross-cutting burrows, many of which are exposed in oblique views (Plate 31/1-6). Therefore, the length and height dimensions measured for individual burrows are minimal values. All of the specimens are straight and unbranched. There is no evidence of any radiating from a central chamber. All of the specimens we have seen are retrusive. We can not certify that the causative organism would not or could not make a protrusive structure that would otherwise be similar to that described here. We believe that a certain amount of plasticity is inherent in trace fossils, dependent on both size and behavioral flexibility of the organism. This fact is readily apparent in the multiple morphologies given the same name in the chart prepared by CHAMBERLAIN (1978). An indication of the morphologic variability that may exist is represented by several traces found at the Holmes locality that are approximately circular in plan view, without internal linear tunnels, and with diameters up to 45 cm. This form does not fit the geometric definition of the species, but is similar in the infilling sediment and other respects and is closely associated with specimens of *T. pescaderoensis*. These facts suggest that it was constructed in the same manner by the same organism. In this case, however, the burrower worked over a broader area rather than along a single linear path, perhaps mining out a particularly nutrient-rich patch in the sediment.

**Geographic and Stratigraphic Distribution**

We have found *Teichichnus pescaderoensis* in Neogene strata of the San Mateo