

# *Vitakrisaurus saraiki* Theropod from South Asia

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## Abstract

*Vitakrisaurus saraiki* abelisauroid theropod dinosaurs reported from Pakistan and extended distribution into India. *Vitakrisaurus saraiki* is medium to large sized theropod which is represented by associated vertebral and limb elements and especially hand elements. Out of 14 small to large bodied theropods from Indo-Pakistan subcontinent, only less than half of these are restricted to some common elements. *Vitakrisaurus saraiki* theropod of Pakistan is based on associated vertebral and limb elements especially hand including articulated carpals, metacarpals, phalanges and claws which are significant for Gondwanan paleobiogeographic link, comparisons and systematic.

## Keywords

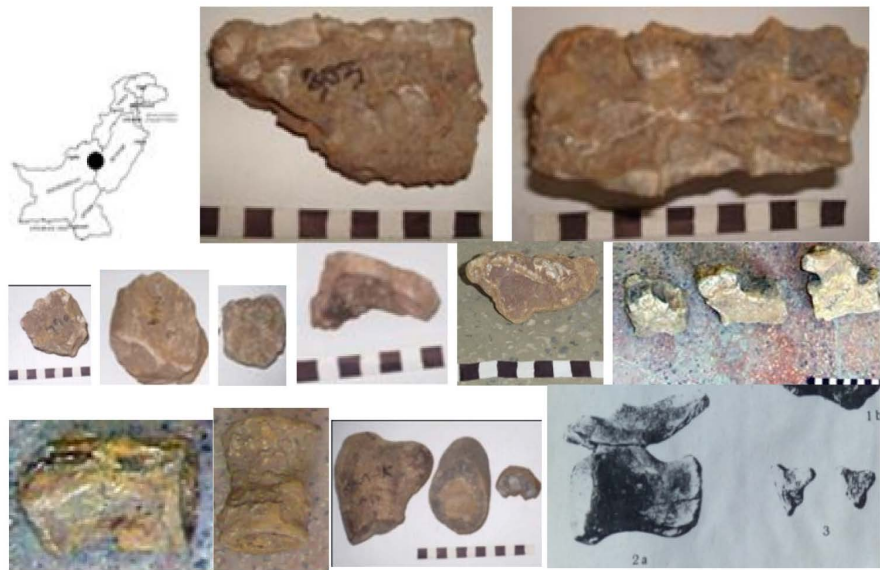
Theropod, Maastrichtian, Vitakri Lameta Formation, Pakistan

## 1. Introduction

Two theropod dinosaurs were known from Pakistan. *Vitakrisaurus saraiki* is a medium sized theropod, which is significant for systematic and comparisons.

## 2. *Vitakrisaurus saraiki* Medium Sized Theropod of South Asia

Systematic paleontology of *Vitakrisaurus saraiki* is as follows: Dinosauria, Saurischia, Theropoda, Abelisauroidea, Vitakrisauridae [1], *Vitakrisaurus* [1], *Vitakrisaurus saraiki* [1] (**Figure 1**). Holotype and lectotype specimens were collected from the mid Bor 2 locality and referred specimens (**Figure 1**) were collected from the Shalghara 3 locality found in the uppermost Maastrichtian (67 - 66 Ma ago) Vitakri Lameta Formation of the Fort Munro Group, Barkhan district, Balochistan, Sulaiman or middle Indus basin, central Pakistan. Genus *Vitakrisaurus* honors the *Vitakri* host locality; saurus means lizard. Species name is in honor of the Saraiki language of locals of Sulaiman Range. These fossils are



**Figure 1.** *Vitakrisaurus saraiki* theropod fossils. Row 1, Map of Pakistan (black circle) show mid Bor 2 type locality, holotypic hand/manus. Row 2, lectotypic vertebral and limb fossils from mid Bor 2. Row 3, referred fossils from Pakistan (p 1 - 3) and India (p 4). Each black digit is 1 cm.

hosted in the Quetta museum of Geological Survey of Pakistan. Amphicoelous caudal vertebra with two chevrons from India [2] was referred to *Vitakrisaurus saraiki*.

### 2.1. Diagnosis of *Vitakrisaurus saraiki* Theropod from South Asia

*Vitakrisaurus saraiki* has circular elongated cylinder type dorsal centrum jointed on all dorsal length with neural arch (while dorsal centra of *Vitakridrinda* is rectangular and elongated while the dorsal centrum of *Rajasaurus* is tall); *Vitakrisaurus* has transverse process on upper part of caudal centrum and extends into neural arch like *Rajasaurus* while *Vitakridrinda* has oval shaped transverse process which did not contact with neural arch and located on upper part of posterior articular ring on anterior caudal centrum. Neural arch on anterior caudal is forwardly inserted while in *Rajasaurus* the neural arch covers all along the dorsal surface of centrum. *Vitakrisaurus* did not have ventral keel in dorsal and caudal centra while *Rajasaurus* and *Rahiolisaurus* had ventral keel. *Vitakrisaurus* neural canal is dorsoventrally compressed while *Rajasaurus* it is circular shaped; *Vitakrisaurus* has well developed chevron facets in anterior/mid caudals while *Rajasaurus* has no chevron facets. *Vitakrisaurus* anterior and midcaudal vertebrae have posterior yard on posterior uncover part of dorsal aspect of centrum surrounded by laterally and posteriorly thin boundary wall while this yard is not found in *Rajasaurus* thick bones of manus/hand; Metacarpal I is short and thick, metacarpal II and metacarpal III are thick, long and subequal; manual phalanges are thick; and manual ungual/claw I is thick and slightly recurved downward.

## 2.2. Description of *Vitakrisaurus saraiki* Theropod from South Asia

*Vitakrisaurus saraiki* has dorsal centrum which is circular, amphicoelous, slightly waisted with lateral feeble fossa. *Vitakridrinda* has rectangular and elongated dorsal centrum, while *Rajasaurus* has tall dorsal centrum. The dorsal centrum in *Vitakridrinda* and *Vitakrisaurus* has no ventral keel. In *Rajasaurus*, *Rahiolisaurus* and *Nhandumirim*, a longitudinal keel is present on ventral surface of centrum. The dorsal centrum in *Rajasaurus* is spool-shaped, with its articular faces deeper than broad. *Vitakrisaurus* has circular elongated cylinder type dorsal centrum jointed on all dorsal length with neural arch. *Vitakrisaurus* has transverse process on upper part of caudal centrum and extended into neural arch as *Rajasaurus*, while *Vitakridrinda* has oval shaped transverse process, not contacted with neural arch and located on upper part of posterior articular ring on anterior caudal centrum. Neural arch on anterior caudal is forwardly inserted while in *Rajasaurus* the neural arch cover all along the dorsal surface of centrum. *Vitakrisaurus* have well developed chevron facets in anterior/mid caudals. *Rajasaurus* has no chevron facets. In *Vitakrisaurus* neural canal is dorsoventrally compressed, transversely oval shaped in anterior and middle caudal vertebrae. In *Rajasaurus* neural canal is circular shaped. In *Vitakrisaurus* anterior and midcaudal vertebrae have posterior yard on the posterior vacant/uncover part of dorsal aspect of centrum. This yard is surrounded laterally and posteriorly by thin boundary wall. *Vitakrisaurus* have leg bones with thin peripheral bone on the central hollow cavity. *Vitakridrinda* has thick peripheral bones on central hollow cavity. The hand/manus has three preserved digits. The metacarpal I is the smallest while Metacarpal II is largest and metacarpal III is relatively intermediate. The metacarpal I is expanded at proximal and distal ends, while in the middle constricted. The metacarpal II is the longest and also thickest. The metacarpal III is intermediate in length, thicker than metacarpal I and metacarpal II. The metacarpal I (7 mm wide, 21 mm long) is short and thick, metacarpal II and metacarpal III are thick, long and subequal. Manual phalanx I is thick and long while reducing length and increasing count from digit I to digit II and then to digit III. Manual ungual/claw I is thick and slightly recurved downward.

### Conflicts of Interest

The author declares no conflicts of interest regarding the publication of this paper.

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