

= Trapalcotherium =

Trapalcotherium is a fossil mammal from the Cretaceous of Argentina in the family Ferugliotheriidae . The single species , *T. matuastensis* , is known from one tooth , a first lower molar . It is from the Allen Formation , which is probably Maastrichtian in age , and was first described in 2009 . The tooth bears two rows of cusps , one at the inner (lingual) side and the other at the outer (labial) side , which are connected by transverse ridges separated by deep valleys . This pattern is reminiscent of Ferugliotherium , a gondwanatherian mammal from similarly aged deposits in Argentina , and Trapalcotherium is therefore recognized as a member of the same family Ferugliotheriidae . Ferugliotheriidae is one of two families of gondwanatheres , an enigmatic group without close relationships to any living mammals .

= = Discovery and context = =

The only known fossil of Trapalcotherium was found at Cerro Tortuga in Río Negro Province , southern Argentina . This locality is in the Allen Formation , one of three formations (rock units) that have yielded Late Cretaceous gondwanatherian fossils from Argentina (the others are the Los Alamitos and La Colonia Formations) . All three are probably about equally old , from the Maastrichtian (latest Cretaceous , about 71 ? 66 million years ago , mya) and perhaps partly the Campanian (84 ? 71 mya) . The mammals from the Allen Formation are known from seven teeth , six of which represent four species of dryolestoids ? a group of primitive mammals that dominates the Late Cretaceous mammalian faunas of Argentina . The fauna was described in a 2009 paper by Guillermo Rougier and colleagues , who named Trapalcotherium as well as several new dryolestoids . The generic name , Trapalcotherium , combines the name of the basin where Cerro Tortuga is located , Bajo Trapalca , with the Greek therion " beast " , commonly used to mean " mammal " in scientific names . The specific name , matuastensis , derives from Puesto El Matuesto , a shed used by the paleontologists who collected the fossils from the Allen Formation .

= = Description = =

The single tooth of Trapalcotherium is identified as a lower molar because it has two longitudinal rows of cusps ; as a first molar because it is longer than wide ; and as a left tooth because the left side (interpreted as labial , in the direction of the lips) bears more cusps than the right side (lingual , the direction of the tongue) . The tooth is 2 @. @ 48 mm long and 2 @. @ 07 mm wide . Part of the back labial corner is missing .

The lingual row contains three cusps and the labial probably five (the broken corner renders the number uncertain) . Transverse ridges , separated by deep valleys , connect the lingual and labial cusps ; therefore , the cusps are not strongly separate , but rather fused . The lingual cusps are larger and separated by larger valleys than the labial ones . At the front of the tooth is a triangular structure consisting of the first lingual and the first two labial cusps . A low crest connects the first lingual to the first labial cusp and a stronger crest , separated from the first by a relatively shallow valley , connects the second lingual to the first labial cusp . Behind this structure , a second triangle is formed by two crests passing from the second lingual cusp to two cusps at the labial side (the back of the two is broken away , but its existence is presumed from the crown pattern) . The front of these two crests is interrupted by a groove . The third lingual cusp is also connected to two crests , which encircle a small depression and presumably connected to one or more labial cusps , which are missing from the fossil .

= = Relationships = =

Trapalcotherium is identified as a member of Gondwanatheria ? a small and enigmatic group of mammals from Cretaceous and Paleogene of the southern continents (Gondwana) ? on the basis of the transverse ridges and triangle on its crown . It resembles Ferugliotherium from the Los

Alamitos Formation , the only previously known uncontroversial member of the family Ferugliotheriidae , but differs in some characters : the triangle at the front is narrower in Trapalcotherium ; the valley behind the front triangle is less curved ; the ridges attached to the second lingual cusp form another triangle ; the tooth is relatively shorter ; Trapalcotherium does not have the Y @-@ shaped valleys between cusps seen in Ferugliotherium ; and the tips of the lingual cusps are more labially placed . The evolutionary affinities of gondwanatheres , which include the Ferugliotheriidae and the higher @-@ crowned Sudamericidae , are controversial , though a relationship with multituberculates (a large group mainly known from the northern continents of Laurasia) has repeatedly been proposed ; the identification of Trapalcotherium does not provide additional information that has a bearing on the relationships of the gondwanatheres .