

Large caenagnathids (Dinosauria, Oviraptorosauria) from the uppermost Cretaceous of western Canada



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ABSTRACT

Large caenagnathid unguals are described from the Dinosaur Park (upper Campanian) and Frenchman (Maastrichtian) formations of Alberta and Saskatchewan, respectively. The latter constitutes the first formal description of Caenagnathidae from the Frenchman Formation. The Saskatchewan material is also notable for its large size, comparable to *Anzu wyliei* from the coeval Hell Creek Formation, placing them among the largest caenagnathids from North America. The slightly smaller Dinosaur Park unguals may pertain to either *Caenagnathus collinsi* (a taxon for which manual material is only tentatively known) or to an as yet unidentified large taxon. The new material demonstrates that despite an apparent reduction in diversity in the Maastrichtian, North American caenagnathid distribution did not retract notably from its Campanian maximum.

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1. Introduction

Oviraptorosauria is an unusual group of derived, bird-like theropods characterized by edentulous jaws (Osmólska et al., 2004). The two subfamilies, Oviraptoridae and Caenagnathidae generally represent a respective Asian–North American dichotomy, although several occurrences including *Caenagnathasia martinsoni* (Uzbekistan), *Elmisaurus rarus* (Mongolia), *Gigantoraptor erlianensis* (China), *Nomingia gobiensis* (Mongolia), and a putative isolated cervical vertebra from the Isle of Wight indicate a wider Laurasian distribution for Caenagnathidae (Currie et al., 1993; Maryańska et al., 2002; Naish and Martill, 2002; Longrich et al., 2013).

The rather cumbersome nomenclatural history of caenagnathid oviraptorids extends back to the description of *Chirostenotes pergracilis* from the upper Campanian Dinosaur Park Formation, which was based on a pair of articulated mani from a single individual (Gilmore, 1924). Since their initial discovery, the caenagnathid fossil record has consisted largely of isolated bones (especially dentaries) and articulated but isolated mani or pedes. Moreover, specimens rarely have any areas of overlap, making comparisons difficult if not impossible between taxa and confounding attempts to decipher the limited fossil record of these animals (Sues, 1997; Currie and Russell, 1988; Currie, 1988, 2000, 2005; Maryańska

et al., 2002; Osmólska et al., 2004; Longrich et al., 2013; Funston and Currie, 2014). The recent description of three partial skeletons from the Hell Creek Formation assigned to the new taxon, *Anzu wyliei*, has provided the most complete picture yet of any North American oviraptorosaur (Lamanna et al., 2014).

Longrich et al. (2013) considered North American representatives of Caenagnathidae to form a monophyletic clade, Caenagnathinae, ranging from Alberta to Texas (Fig. 1). These were typically small (less than 40 kg but up to ~300 kg in *Anzu*; Lamanna et al., 2014) and rare members of Late Cretaceous (Campanian–Maastrichtian) terrestrial ecosystems. Although the skeletal anatomy is poorly known in most genera, caenagnathids (and oviraptorosaurs in general) possess easily-identified manual unguals characterized by a prominent dorsal ‘lip’ on the proximal articular surface and a well-developed flexor tubercle (Currie, 1990). Here we report on the discovery of several unusually large unguals from the Maastrichtian Frenchman Formation (Saskatchewan) with additional material from the upper Campanian Dinosaur Park Formation (Alberta) that supplement this sparse record and add especially to the Maastrichtian distribution of these enigmatic animals.

2. Locality and age

The new material comes from the Frenchman Formation in southwestern Saskatchewan with additional large unguals from the

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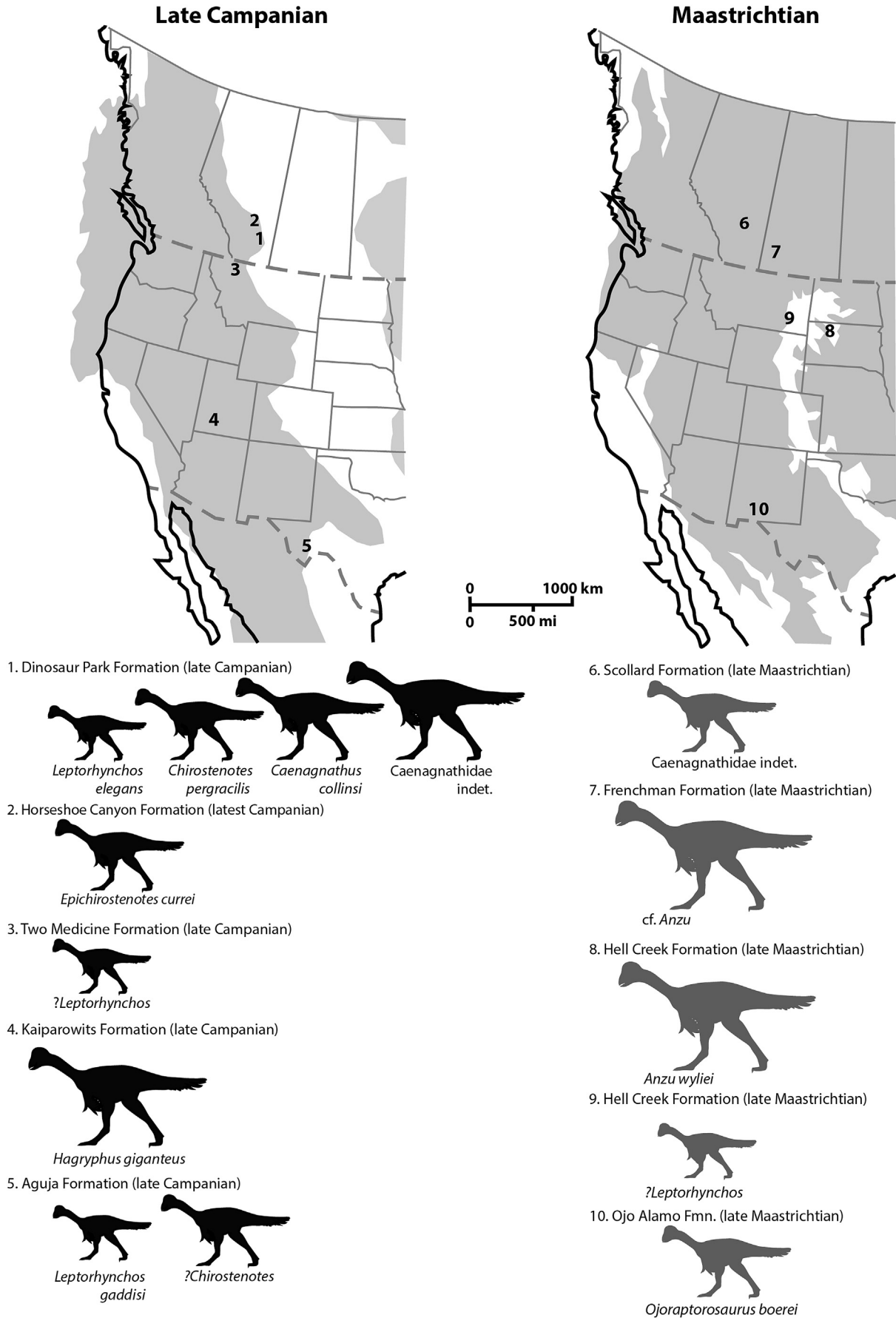


Fig. 1. Late Cretaceous caenagnathid diversity in North America. Maastrichtian taxa are illustrated in grey; Campanian taxa are in black. Reports of undescribed caenagnathid material from the Lance Formation of Wyoming (Osmólska et al., 2004) are not included here although they fall within the predicted Maastrichtian distribution. Palaeogeographic reconstructions are based on Blakey (2013).

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