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First record of a tarsometatarsus of *Tonsala hildegardae* (Plotopteridae) and other avian remains from the late Eocene/early Oligocene of Washington State (USA)

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Abstract

New bird fossils from the late Eocene/early Oligocene Makah Formation and the Oligocene Pysht Formation on the Olympic Peninsula (Washington State, USA) are described. A partial skeleton from the Pysht Formation includes the first reported tarsometatarsus of *Tonsala hildegardae* Olson, 1980, a wing-propelled diving bird of the taxon Plotopteridae. It shows that *Tonsala* had a tarsometatarsus that was morphologically intermediate between that of the late Eocene *Phocavis* and more derived plotopterids. We introduce the new taxon Tonsalinae nov. subfam. for a clade including all named plotopterids except *Phocavis*, *Plotopterum*, and the recently described *Stemec*. We furthermore describe a partial plotopterid pelvis and a sternum from the Makah Formation. The sternum shows a close resemblance to that of extant Phalacrocoracoidea (cormorants and darters) and may be the earliest North American record of this taxon.

Keywords:Aves; Plotopteridae; Phalacrocoracoidea; Paleogene; Makah Formation; Pysht Formation; North America

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1. Introduction

Paleogene strata of the Olympic Peninsula (Washington State, USA) have yielded a number of avian fossils that shed light on the poorly known early Cenozoic avifaunas of the North American Pacific coast. Most of these specimens stem from the late Eocene/early Oligocene Jansen Creek Member of the Makah Fm. (Snavely et al., 1980; Prothero et al., 2009) and the overlying Pysht Fm., which is of late early or late Oligocene age (Prothero et al., 2001;