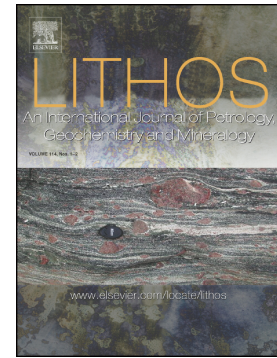


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The Mesozoic and Palaeozoic granitoids of north-western New Guinea

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ABSTRACT

A large portion of the Bird's Head Peninsula of NW New Guinea is an inlier that reveals the pre-Cenozoic geological history of the northern margin of eastern Gondwana. The peninsula is dominated by a regional basement high exposing Gondwanan ('Australian') Palaeozoic metasediments intruded by Palaeozoic and Mesozoic granitoids. Here, we present the first comprehensive study of these granitoids, including field and petrographic descriptions, bulk rock geochemistry, and U–Pb zircon age data. We further revise and update previous subdivisions of granitoids in the area. Most granitoids were emplaced as small to medium-scale intrusions during two episodes in the Devonian–Carboniferous and the Late Permian–Triassic, separated by a period of apparent magmatic quiescence. The oldest rocks went unrecognised until this study, likely due to the younger intrusive events resetting the K–Ar isotopic system used in previous studies. Most of the Palaeozoic and Mesozoic granitoids are peraluminous and in large parts derived from partial melts of the country rock. This is corroborated by local migmatites and country rock xenoliths. Although rare, the metaluminous and mafic rocks show that partial melts of mantle-derived material played a minor role in granitoid petrogenesis, especially during the Permian–Triassic. The Devonian–Carboniferous granitoids and associated volcanics are locally restricted, whereas the Permian–Triassic intrusions are found across NW New Guinea and further afield. The latter were likely part of an extensive active continental margin above a subduction system spanning the length of what is now New Guinea and likely extending southward through eastern Australia and Antarctica.

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