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Volcanological study of the middle Miocene Okiduse Volcanic Group, Woodlark Island (Muyuw), eastern Papua

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SUPPLEMENTARY PAPERS

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Copies of Supplementary Papers may be obtained from the Geological Society of Australia's website (www.gsa.org.au), the Australian Journal of Earth Sciences website (www.ajes.com.au) or from the National Library of Australia's Pandora archive (http://nla.gov.au/nla.arc-25194).

SUPPLEMENTARY PAPER

Geological map of the Okiduse Volcanic Group. (a) North Sheet. (b) South Sheet.

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GEOLOGICAL MAP OF THE OKIDUSE VOLCANIC GROUP, WOODLARK ISLAND (MUYUW), EASTERN PAPUA

DESCRIPTION OF MAP UNITS

SURFICIAL DEPOSITS

HOLOCENE AND PLEISTOCENE DEPOSITS

Qa — Alluvium silt, sand and gravel.

Qpk — **Kiriwina Formation** marine claystone, carbonaceous shale, sandstone, coral limestone. C^{14} age of 31,500-39,500±800 a.

OKIDUSE VOLCANIC GROUP

MIOCENE ROCKS OF THE WATOU MOUNTAIN ERUPTIVE CENTRE

Vent association

$Tmow_6$ **Boganuse Formation** Mostly lava flows with welded fall deposits and breccias.

$Tmow_1$ **Kuikébeim Microdiorite** Rocks ranging from grey andesite to fine-grained diorite.

Cone-forming association

$Tmow_2$ **Nikuben Formation** Mostly dark grey block and ash deposits withbasaltic lava flows and red auto-clastic breccia.

Ring plain association

$Tmow_3$ **Talpas Creek Formation** Grey heterolithologic lahar deposits, conglomerate and red-purpleand yellow-brown sandstone with minor basalt flows, mafic ash layers and non-marine carbonaceous mudstone.

Mafic dykes

$Tmow_4$ Gabbro and dolerite dykes. Narrow 2-4 m dykes consisting of abundant 0.5-1.0 mm idiomorphic hornblende with plagioclase.

MIOCENE ROCKS OF THE UVARAKOI CALDERA

Intracaldera association

$Tmou_1$ **Monasiy Tuff** Non-welded reddish-grey felsic tuff. Mapped together with felsic tuff of the outflow facies as one unit. Typically homogenous unit with lithics and crystals set in an ash matrix. Lapilli-sized cognate lithics (andesite, felsic rocks) are uniformly distributed throughout deposit.

$Tmou_2$ **Busai Hill Ignimbrite** Poorly welded yellow-brown crystal rich porphyritic ignimbrite capping Busai Hill, low ranges east of Reilly's Creek, north of Busai Hill and Bomagai Hill. Consists of idiomorphic crystals of plagioclase to 4 mm, some of which are occasionally broken, with minor hornblende to 1 mm size, set in a fine-coarse ash matrix. Densely welded zones and vesiculation occur locally. Base of the unit is gradational with $Tmou_1$ and is inturn overlain by unit.

$Tmou_3$ **Vulcan Lava** Non-outcropping and known only from drillhole in the Busai pit. Light brown to grey, fine-grained lava with amygdales of quartz and calcite.

$Tmou_4$ **Federation Breccia** Grey and red-grey heterolithologic breccia with cognate lithics consisting of porphyritic andesite and basalt, ash and basalt. Matrix is lapilli sized. Includes minor autoclastic breccia. Known only from drillhole in the Busai pit.

Outflow association

$Tmou_1$ **Monasiy Tuff** Non-welded red-grey to yellow-brown tuff sheet with widespread occurrence. Typically a homogenous unit with lithics and crystals set in an ash matrix. Lapilli sized cognate lithics (basalt, porphyritic basalt, felsic rocks) are uniformly distributed throughout unit. The upper part of the unit is typically crystal rich. Grading of crystals can be observed in hand specimen. Crystals are often broken and/or aligned. Accretionary lapilli and bomb beds occur throughout, indicative of the compound nature of the deposit. Fluvial, lahar and slope wash deposits ($Tmou_5$) occur interbedded in the unit adjacent the inferred ring fracture of the Uvarakoi Caldera. Plinian ash layers and base surge deposits have been observed at Kulumadau. The high degree of fragmentation and the widespread occurrence of the tuff sheet suggests either a plinian or phreatoplinian deposit. The mineralisation at Kulumadau, Ivanhoe, Boscalo and Great Northern is hosted by this unit.

$Tmou_3$ **Mt Kabat Breccia** Very poor to extremely poorly sorted deposits with extreme grain-size range and lack of well defined stratification. Clasts vary from angular to well rounded and are monolithlogic. At Mt Kabat clasts consist of partially to densely welded tuffs, with atextural similarity to unit $Tmou_2$, Busai Hill Tufflava. At Manau Hill clasts consist of felsic tuff similar to unit $Tmou_6$, Manau Hill Tuff. Matrix is red-purple, medium to coarse grained. Trail (1967) noted the presence of richly fossiliferous (pelecypods) and carbonised plant-bearing tuff clasts from the conglomerate at Waikim. Minor interbedded well sorted, fine-medium grained red-purple sandstones.

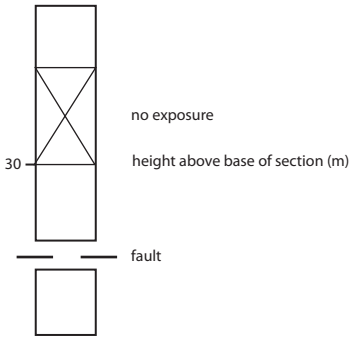
$Tmou_6$ **Manau Hill Tuff** Non-welded grey latitic ashflow sheet containing about 50% phenocrysts (mainly plagioclase, hornblende, biotite and augite). Angular andesitic fragments are locally conspicuous. Forms a capping on Manau Hill, with a thickness of 40 m.

MIOCENE REGIONAL DYKES

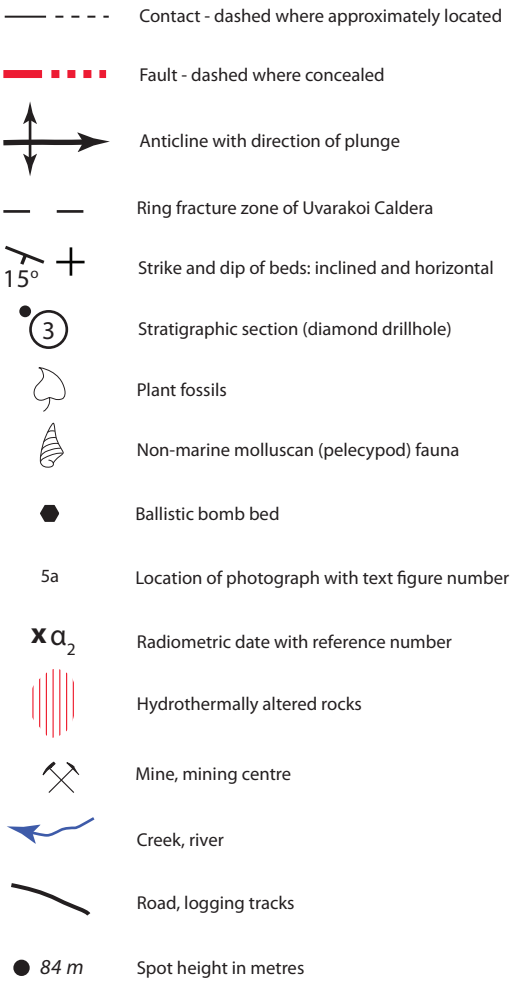
Tmd — Felsic dykes. Felsic porphyritic dykes, 30-60 m wide in the Boniavat-Okiduse district, elsewhere 1-2 m, containing either idiomorphic phenocrysts or laths of plagioclase with lesser amounts of hornblende, set in a medium grained groundmass. Groundmass texturally resembles that of $Tmou_1$, Monasiy Tuff, and $Tmou_2$, Busai Hill Tufflava. May include xenoliths of hornblendite. K-Ar age of 11.4±0.1 Ma.

Tmm — Mafic dykes. Andesite and pyroxene bearing porphyritic basalt. Narrow 1-4 m wide dykes. Porphyritic dykes contain large (5-8 mm) phencrysts set in a fine-grained basalt groundmass.

STRATIGRAPHIC COLUMN SYMBOLS



GEOLOGICAL MAP SYMBOLS



Base from MADAU (9379) and MUYUA (9479) 1:100,000 sheets
Geographic names by Oken Miskelei, Kulumadau
and after Evan R. Stanley (1912)

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Mt Kabat 243 m
84 m
175 m
126 m
104 m
146 m
Kaurai
Dakoias
Uvarakoi (kunai)
Monasiy (kunai)
Kai (kunai)
Taneigas (Kulumadau Hill)
Federation
Yank's Gully
Vulcan
Busai
Bomagai
Coral Creek (Uybwabam)
Reilly's Creek (Lala)
Mackenzie's Ck
Scott's Ck
Coleman's Creek
Piak
Waikim
Great Northern
Kweiyua
Boscalo
Ivanhoe
Kulumadau
Numba 3
Maguwa
Weinua
Uybwabam
SHEAR
VULCAN D.
FAULT
SINKWARAI
UNMAPPED
KWAIAPAN BAY
Boiboi
Qpk
Qa
Qa/Qpk
Tmou1
Tmou2
Tmou5
Tmd
Tmm
MAP INDEX
NORTH SHEET
SOUTH SHEET
N
1 km

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