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1963/31

MESOZOIC FOSSILS FROM RAMU 1:250,000 SHEET AREA, TERRITORY OF NEW GUINEA

by

S.K. Skwarko

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CONTENTS

SUMMARY

Twenty one collections of marine macrofossils represent five fossiliferous lithological units of Mesozoic age from the Ramu 1:250,000 Sheet area, Territory of New Guinea. The age of these units is discussed.

The Jimi Greywacke is the oldest unit, being of Carnian - Norian (Upper Triassic) age. The Kana Formation conformably overlies the Jimi Greywacke but is still of Upper Triassic age. The first identification of marine Triassic in New Guinea by Cox (written communication) is confirmed. An angular unconformity which represents a non-depositional period of short duration separates the Kana Formation from the overlying Balimbu Greywacke which is of Lower Jurassic, probably Sinemurian - Pliensbachian age. This is the first record of marine Lower Jurassic sediments in New Guinea. The Mongum Volcanics conformably overlie the Balimbu Greywacke and are in turn conformably overlain by the Maril Shale - its age, therefore, may be Middle Jurassic, but its fossil content is not diagnostic. The Maril Shale, the highest Mesozoic fossiliferous unit in the area, is Upper Jurassic, probably Tithonian in age, and conformably overlies the Mongum Volcanics.

INTRODUCTION

Twenty one collections of Mesozoic fossils collected by D.B. Dow and F.E. Dekker during the 1962 field season from the Ramu 1:250,000 Sheet area, Territory of New Guinea, have been submitted for dating. They represent five lithological units which were found to range in age from Upper Triassic to Upper Jurassic.

For the purpose of dating only a preliminary generic determination of fossils sufficed in a number of cases. This preliminary report will be followed by a more thorough palaeontological work.

Dr. L.R. Cox of the British Museum (Natural History), London, is currently describing a small collection of fossils from the Jimi Greywacke made by D.B. Dow in 1961.

JIMI GREYWACKE

The unit mapped under the name of Jimi Greywacke is of Upper Triassic age on fossil evidence, and is the oldest sedimentary unit in the region. It consists of greywacke, calcareous greywacke, and minor shale, and is conformably overlain by sediments of the Kana Formation, which is also of Upper Triassic age.

Collections of fossils have been gathered at eleven points in the Jimi Greywacke (see Table 1), all on the Ramu 1:250,000 Sheet area, and the descriptions of the collecting sites accompanied by lists of fossils and notes on dating follow below.

LOCALITY M.26: 5 miles north-east from Tabibuga. No photos. Collected by D.B. Dow, September, 1962.

Fossils: Pelecypoda: Costatoria sp.nov.aff.C.inaequicostata (Klipstein), 1845
"Gervillia" sp.nov.aff. "G." mytiloides (Schlotheim), 1820

Gastropoda: Pleurotomaria? sp.nov.

Brachiopoda: Rhynchonella sp.nov.

The Triassic age of the collection is suggested by both Costatoria and "Gervillia". Costatoria, a myophoriid, is restricted to the Triassic, and its large size suggests Upper Triassic age, as only small forms are found in the Lower and Middle Triassic sediments. The new species of "Gervillia" is most closely related to "G." mytiloides from the Lower to Middle Triassic of Europe and south-west Asia. The ranges of the new species of Gastropoda and Brachiopoda are not yet known.

LOCALITY M.29: 5 miles east of Tabibuga. No photos.
Collected by D.B. Dow, September, 1962.

Fossils: Pelecypoda: Costatoria sp.nov.aff. C.inaequicostata (Klipstein), 1845.
Anodontophora? sp.nov.

Gastropoda: Pleurotomaria? sp.nov.

LOCALITY H.157: 3 miles north-east of Gebal. Obulu Run 2 Photo 5017
Point H.157. Collected by D.B. Dow, September, 1962.

Fossils: Pelecypoda: Nuculana sp.cf. N.semicrenulata (Trechmann), 1917
Myophoria sp.nov.

Genus nov.?aff. Genus "Gervillia" Defrance, 1820

N. semicrenulata occurs in beds of Carnian (Upper Triassic) age in New Zealand (Marwick, 1953).

LOCALITY H.176: 3 miles west of Gebal. Obulu Run 2 Photo 5019
Point H.176. Collected by D.B. Dow, September, 1962.

Fossils: Pelecypoda: Costatoria sp.nov.aff. C.inaequicostata (Klipstein), 1845
Nuculana sp.cf. N.semicrenulata (Trechmann), 1917
Anodontophora? sp.nov.

"Gervillia" sp.nov.aff. "G." mytiloides (Schlotheim), 1820

Brachiopoda: Spiriferina sp.cf. S.abichi Oppel, 1865

S. abichi occurs in Norian (Upper Triassic) beds of Arabia, and Upper Triassic beds of India (Hudson and Jeffries, 1961).

LOCALITY H.185: 12 miles east of Tabibuga. Obulu Run 1 Photo 5047
Point H.185. Collected by D.B. Dow, September, 1962.

Fossils: Pelecypoda: "Gervillia" sp.nov.aff. "G." rugosa Healey, 1908
Myophoria sp. juvenile

"G." rugosa occurs in Rhaetian (uppermost Triassic or lowermost Jurassic) beds of Upper Burma (Healey, 1908).

LOCALITY H.199: 5 miles east-north-east of Tabibuga. No photos. Collected by B.D. Dow, September, 1962.

Fossils: Pelecypoda: Costatoria sp.nov.aff. C.inaequicostata (Klipstein), 1845

Gastropoda: Pleurotomaria? sp.nov.

LOCALITY H.200: 4½ miles north-east from Tabibuga. No photos. Collected by D.B. Dow, September, 1962.

Fossils: Pelecypoda: "Gervillia" sp.nov.aff. "G." rugosa Healey, 1908
Myophoria sp.nov.aff. M.coxi Awad, 1946

M. coxi has been described from the Lower Ladinian of Israel (Lerman, 1960).

LOCALITY H.574: Between Gebal and Bubultunga. Obulu Run 2a Photo 5059 Point H.574. Collected by F.E. Dekker, August, 1962.

Fossils: Pelecypoda: Myophoria sp.indet.

Gastropoda: Pleurotomaria? sp.nov.

LOCALITY H.575: Between Gebal and Bubultunga. Obulu Run 2a Photo 5059 Point H.575. Collected by F.E. Dekker, August, 1962.

Fossils: Pelecypoda: "Gervillia" sp.nov.aff. "G." mytiloides (Schlotheim), 1820
Anodontophora? sp.nov.

Gastropoda: Pleurotomaria? sp.nov.

Brachiopoda: Spiriferina sp.cf. S.abichi Oppel, 1865

LOCALITY H.607: 1½ miles south of Bubultunga. Obulu Run 2 Photo 5019 Point H.607. Collected by F.E. Dekker, August, 1962.

Fossils: Cephalopoda: Sirenites malayicus Welter, 1914

The genus Sirenites is a widespread ammonite which is found in Carnian and Norian (Upper Triassic) beds of Europe, Himalaya, Timor, and western North America. S. malayicus was originally described from Upper Triassic beds of Timor (Welter, 1914).

LOCALITY H.782: Bombu Creek. Musak Run 5 Photo 5037 Point H.782 Collected by F.E. Dekker, September, 1962.

Fossils: Pelecypoda: Costatoria sp.nov.aff. C. inaequicostata (Klipstein), 1845
Myophoria sp.nov.

"Myophoria" sp.nov.aff. M. germanica Hohenstein, 1913
"Gervillia"? sp.

M. germanica occurs in Lower Ladinian of Israel, Middle and Upper Muschelkalk of Germany, and Muschelkalk of Algeria (Lerman, 1960).

KANA FORMATION

Sediments making up the Kana Formation are composed of detritus derived from acid volcanics, and consist of feldspathic arenite, red tuffaceous shale, and conglomerate.

A single collection of fossils has been gathered from the Kana Formation. The assemblage is similar to that found in the Jimi Greywacke, but is more limited in the number of genera and species. The suggested age of this unit is Upper Triassic.

LOCALITY H.590: Ramu 1:250,000 Sheet area. Kana River, ½ mile north-east of Gebal. Obulu Run 2a Photo 5057 Point H.590.
Collected by F.E. Dekker, August, 1962.

Fossils: Pelecypoda: Costatoria sp.nov.aff. C.inaequicostata (Klipstein), 1845
Brachiopoda: Spiriferina sp.cf. S.abichi Oppel, 1865
Gastropoda: Pleurotomaria? sp.nov.
Scaphopoda: Dentalium sp.indet.

BALIMBU GREYWACKE

Balimbu Greywacke is a basal member of a conformable sequence of sediments which range in age from Lower Jurassic to Lower Cretaceous. It unconformably overlies Kana Formation which is of Upper Triassic age, but the time gap represented by this unconformity is probably not great. Balimbu sediments consist of indurated greywacke and interbedded indurated shale and siltstone; their distribution is limited to a small area north of Mongum.

Four collections of fossils are available from this unit, and the ammonites present suggest Sinemurian - Pliensbachian (Lower Jurassic) age. All collections were made on the Ramu 1:250,000 Sheet area. This is the first record of marine Lower Jurassic sediments in New Guinea.

LOCALITY H.29: 1½ miles north of Mongum. Obulu Run 2a Photo 5058 Point H.29.
Collected by D.B. Dow, August, 1962.

Fossils: Brachiopoda indet.

LOCALITY H.549: Koro River Headwaters. Kerowagi Run 2 Photo 5129 Point H.549. Collected by F.E. Dekker, July, 1962.

Fossils: Cephalopoda: Paltechioceras? Buckman, 1924

The only fossils are two specimens of apparently the same ammonite species. They are imperfectly preserved, but in their many and evolute whorls, dense ribbing and tricarinate bisulcate venter they seem to resemble most closely the genus Paltechioceras from the Upper Sinemurian (Lower Jurassic) of Europe, California and Oregon. The ribs, however, are not prorsiradiate in the mature portion of the New Guinea specimens, although this may be a specific character. It is suggested that the age of strata at this locality is Lower Jurassic.

LOCALITY H.558: 2½ miles north of Mongum. Obulu Run 3 Photo 5126 Point H.558. Collected by F.E. Dekker, July, 1962.

Fossils: Cephalopoda: Tropidoceras? Hyatt, 1867

There are three fragments of a single somewhat squashed specimen and definite determination is not possible, but in the overall shape and ribbing the fossil seems to be most like the genus Tropidoceras. Tropidoceras occurs in sediments of Lower Pliensbachian (Lower Jurassic) age in Europe, North Africa, Anatolia and Indonesia.

LOCALITY H.565: 2 miles north of Mongum. Obulu Run 3 Photo 5126 Point H.565. Collected by F.E. Dekker, July, 1962.

Fossils: Carbonised wood fragments.

MONGUM VOLCANICS

The Mongum Volcanics are basaltic marine volcanics which conformably overlie the Balimbu Greywacke and conformably underlie the Maril Shale. On stratigraphy their age is thus somewhere between Lower and Upper Jurassic. The few fragments of shells found at one locality in these sediments are too poorly preserved even for generic determination.

LOCALITY H.908: Ramu 1:250,000 Sheet area. 1 mile north of Mongum. Obulu Run 2a Photo 5058 Point H.908. Collected by R. Horne, July, 1962.

Fossils: Indeterminate Pelecypoda.

MARIL SHALE

The Maril Shale is an indurated black-grey shale (in places calcarenite) which weathers to yellow-brown soft mudstone. Fresh rock shows deposition of iron pyrites along cleavage planes. There are two areas of outcrop of this shale in the area under discussion. The first, larger, group is distributed around Mongum and to the west of it. It occupies about 2 square miles, and its eastern and south-western limits are possibly fault contacts. The smaller outcrop is about 3½ miles north of Kol.

Fossils have been collected at two points, i.e. H.25 and H.538 where they are relatively abundant, but are considerably distorted by tectonism. They suggest Upper Jurassic, possibly Kimmeridgian - Tithonian, as the age of Maril Shale.

LOCALITY H.25: Ramu 1:250,000 Sheet area. 1 mile north of Kol. Bismarck Run 5 Photo 5153 Point H.25. Collected by D.B. Dow, September, 1962.

The single sample from this locality contains a number of generically indeterminate shell fragments and one nearly complete shell. The latter is a small radially ribbed aviculopectinid (right valve) of unknown generic affinity.

LOCALITY H.538: Ramu 1:250,000 Sheet area. Kerowagi Run 2
Photo 5129 Point H.538.
Collector, F.E. Dekker, July, 1962.

Fossils: Pelecypoda: Buchia malayomaorica (Krumbeck), 1923

Inoceramus sp.cf. I.haasti Hochstetter, 1863

Inoceramus sp.juvenile

Buchia malayomaorica occurs only in the Upper Jurassic strata. Krumbeck (1923) regarded it as limited to upper Lower Oxfordian (basal Upper Jurassic) sediments in the East Indies, and Glaessner (1945) assigned similar age to specimens from the Kuabgen Group in the headwaters of the Fly River, Western Papua. In New Zealand, however, this species is limited to Kimmeridgian and Tithonian (Marwick, 1953), and Fleming (1959) writes: "Although B.malayomaorica has often been cited as an Oxfordian fossil, the writer knows of no occurrence where its Oxfordian age has been firmly established on ammonite determinations." (p.380). Dickins (1958) identified Buchia cf.malayomaorica from Kubor Ranges, New Guinea, and being aware of the uncertainty of long distance correlation based on single pelecypod species, cautiously refrained from dating the source strata any closer than Upper Jurassic.

In view of this, the occurrence of B.malayomaorica in Langey Beds (Dampier Peninsula, Western Australia) is revealing. Brunnschweiler (1961) identified the following fossils from Langey Beds:

Belemnopsis cf. B.aucklandica (Hochstetter)
Belemnopsis cf. B.alfurica (Boehm)
Kossmatia sp.aff. K.tenuistriata (Gray)
Kossmatia cf. K.tenuistriata (Gray)
Buchia malayomaorica (Krumbeck)
Calpionella cf. C. undelloides Colon
Calpionella schneebergeri Brunnschweiler, 1961

and on the basis of the presence of Calpionella Lorenz and K. cf. tenuistriata dated it as very probably mid-Tithonian. This seems to be the first reported association of Buchia malayomaorica with datable ammonites.

Inoceramus haasti occurs in Kimmeridgian beds in New Zealand.

CONCLUSIONS

As a result of the examination of the fossils recently submitted, the following ages are assigned to the Mesozoic units which crop out on the Ramu 1:250,000 Sheet area:

Kondaku Tuff (no fossils	-	Lower Cretaceous.
Maril Shale (H.25, H.538)	-	Upper Jurassic (?Tithonian).
Mongum Volcanics (H.908)	-	?Middle Jurassic.
Balimbu Greywacke (H.29, H.549, H.558, H.565)	-	Lower Jurassic (Sinemurian - Pliensbachian).
---------- Unconformity		
Kana Formation (H.590)	-	Upper Triassic.
Jimi Greywacke (M.26, M.29, H.157, H.176, H.185, H.199, H.200, H.574, H.575, H.607, H.782)	-	Upper Triassic (Carnian - Norian).

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Genera & Species	JIMI GREYWACKE											KANA FORMATION
	M.26	M.29	H.157	H.176	H.185	H.199	H.200	H.574	H.575	H.607	H.782	H.590
Pelecypoda:												
Costatoria sp.nov.aff. C.inaequicostata (Klipstein), 1848	X	X		X		X					X	X
Myophoria sp.nov.			X								X	
Myophoria sp.nov.aff. M.coxi Awad, 1946							X					
"Myophoria" sp.nov.aff. M.germanica Hohenstein, 1913											X	
"Gervillia" sp.nov.aff. "G." mytiloides (Schlotheim), 1820	X			X					X			
"Gervillia" sp.nov.aff. "G." rugosa Healey, 1908					X		X					
Anodontophora? sp.nov.		X		X					X			
Nuculana sp.cf. N.semicrenulata (Trechmann), 1917			X	X								
Gastropoda:												
Pleurotomaria? sp.nov.	X	X				X		X	X			X
Brachiopoda:												
Rhynchonella sp.nov.		X										
Spiriferina sp.cf. S.abichi Oppel, 1865				X					X			X
Cephalopoda:												
Sirenites malayicus Welter, 1914										X		

TABLE 1. Showing the distribution of fossils in Jimi and Kana Formations.

GEOLOGICAL MAP OF BISMARCK MOUNTAINS NEW GUINEA

SCALE — 1:250,000

0 1 2 3 4 5 10 MILES

REFERENCE

Geological Boundaries
- Geological boundary, position approximate
- Geological boundary, position inferred
- Unconformity

Bedding (Strike and dip of strata)
- Inclined
- Horizontal
- Vertical
- Photo-interpreted

Foliation (Strike and dip)
- Inclined
- Vertical

Banding (Strike and dip)
- Inclined

Sample Localities
- Petrological locality
- Microfossil locality
- Macrofossil locality

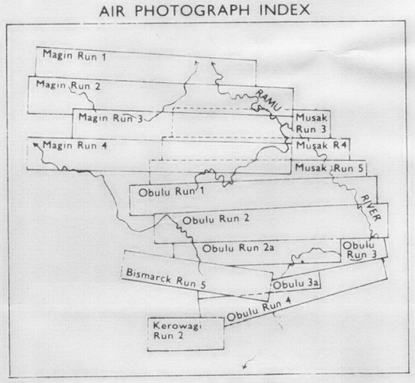
Faults
- Position approximate
- Inferred fault
- Shear zone

Joints
- Strike and dip

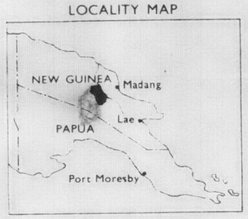
Folds
- Synclinal axis
- Anticlinal axis
- Pitching folds

General
- Mine workings
- Native villages
- Major peaks
- 5510 Spot heights in feet
- Major tracks
- Airstrip

AIR PHOTOGRAPH INDEX



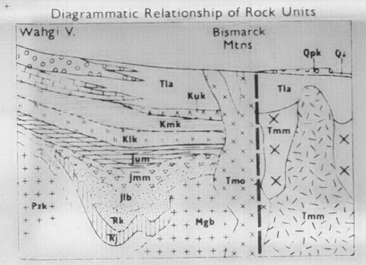
LOCALITY MAP



REFERENCE

CAINOZOIC	QUATERNARY	RECENT	UNDIFFERENTIATED	Qra	Mudstone, siltstone, conglomerate, gravel
		PLEISTOCENE	KIRAMBUL CONGLOMERATE	Qpk	Conglomerate, mudstone, sandstone
	PLIOCENE		PORPHYRY	Tp	Porphyritic microdiorite
	TERTIARY	?MIOCENE f-STAGE	OIPO GABBRO INTRUSIVES	Tmo	Gabbro, granodiorite, porphyritic microdiorite.
		?MIOCENE	MARUM BASIC BELT	Tmm	Gabbro Dunite, peridotite, pyroxenite.
		MIOCENE f-STAGE TO UPPER CRETACEOUS	ASAI BEDS	Tla	Phyllite, shale, pebble conglomerate. Calcarenite.
MESOZOIC	CRETACEOUS	UPPER	KUMBRUF VOLCANICS	Kuk	Pillow lavas, agglomerate, tuffaceous greywacke, siltstone
		MIDDLE	KOMPIAI BEDS	Kmk	Siltstone, shale, feldspathic greywacke, phyllitic shale.
		LOWER	KONDAKU TUFF	Klk	Tuff, agglomerate, greywacke. Basalt.
	JURASSIC	UPPER	MARIL SHALE	Jum	Shale. Limestone.
		MIDDLE	MONGUM VOLCANICS	Jmm	Basalt, agglomerate.
		LOWER	BALIMBU GREYWACKE	Jlb	Greywacke, siltstone.
	UNCONFORMITY		BISMARCK GRANODIORITE	Mgb	Granodiorite.
	TRIASSIC	UPPER	KANA FORMATION	Rk	Feldspathic sandstone, tuffaceous siltstone. Conglomerate.
			JIMI GREYWACKE	Rj	Greywacke, conglomerate, shale.
? PALAEOZOIC			GOROKA FORMATION	Pzg	Schist, marble, phyllite.

Diagrammatic Relationship of Rock Units



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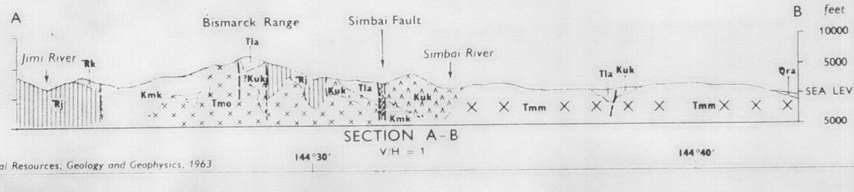

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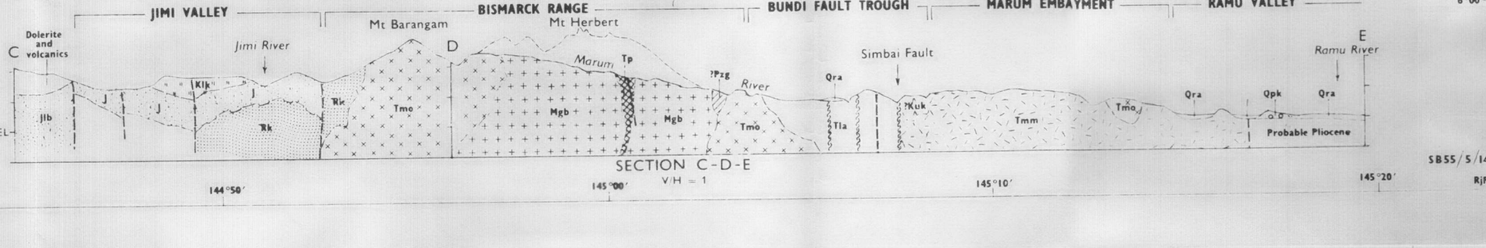
SECTION C–D–E



V/H = 1

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