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Detrital zircon ages and geochemistry of sedimentary rocks in basement Mesozoic terranes and their cover rocks in New Caledonia, and provenances at the Eastern Gondwanaland margin.

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Geochemical and Sr-Nd isotope data for Mesozoic greywackes of New Caledonia terranes, indicate a fore-arc tectonic environment at the Eastern Gondwanaland margin, but they support only minor continental influences. Detrital zircon U-Pb age patterns for the greywackes similarly reflect an active-margin tectonic environment of Late Triassic, Late Jurassic, and in particular mid-Cretaceous, depocentres which comprise much contemporaneous volcanic detritus, but also include minor sediment inputs from early Paleozoic-Precambrian continental clastic rocks. The contemporary volcanic sources are probably now hidden within a former hinterland to New Caledonia, such as Loyalty and Norfolk Ridges, Lord Howe Rise or Marion Plateau. The older, continental sediment sources were probably in northeasternmost Queensland, and beyond the northern extremity of the New England Orogen. Such sediments could have been supplied on long rivers, and submarine long-shore current systems outboard of the orogen. Alternatively, the depocentres could have been consolidated close to the contemporary Gondwanaland margin and then tectonically transported, as suspect terranes, southwards in Early Cretaceous times to their present New Caledonia position.

KEY WORDS: New Caledonia, Gondwanaland, Mesozoic, volcaniclastic sedimentary rocks, geochronology, detrital zircon, geochemistry, strontium isotopes, neodymium isotopes.

INTRODUCTION

Situated at the Pacific edge of the Mesozoic Australasian continent crust, New Caledonia and New Zealand provide two comparable sectors of the former, late Paleozoic-Mesozoic Gondwanaland continental margin (Fig.1 inset). New Zealand and New Caledonia are part of a large, but mostly submerged, continental crustal block, ‘Zealandia’. This extends from the Chatham Rise and Campbell Plateau (southwest Pacific Ocean), through New Zealand, the Challenger Plateau and Lord Howe Rise, to

New Caledonia. It has been extensively studied New Zealand where the Zealandia basement comprises Paleozoic and Mesozoic sedimentary rocks, active-margin volcanic arcs, and associated plutonic complexes. These are divided into an early Paleozoic, Western Province, clearly related to the Lachlan Fold Belt of southeast Australia, and an Eastern Province, which comprises six late Paleozoic-Mesozoic elongate, tectonostratigraphic terranes. Situated between Western and Eastern Provinces, a Median Batholith, of Permian-Cretaceous plutonic rocks (Bishop et al. 1985, Mortimer et al. 1999), may be correlated with the more extensive Carboniferous-Jurassic igneous complexes within the New England Fold Belt of northeast Australia,

The Eastern Province terranes of New Zealand comprise an eastern group (Torlesse, Waipapa and Caples) of Permian to Cretaceous, greywacke-dominated turbiditic sequences deposited in an accretionary prism environment (Bishop et al. 1985). The easternmost, Torlesse Terrane is dominated by relatively quartzose greywacke sediments derived from continental sources which included plutonic and metamorphic rocks (MacKinnon 1985), whilst the Waipapa and Caples Terranes (Sporli 1978, Turnbull, 1979) have more acid-intermediate volcaniclastic sediment inputs, and resemble those of the New Caledonia Central Terrane. The remaining, western, terrane group (Dun Mountain-Maitai, Murihiku, Brook Street), has mainly Permian, Triassic and Jurassic, redeposited volcaniclastic greywacke-dominated successions (Ballance & Campbell 1993, Landis et al. 1999), but in a more shallow-water, probable forearc setting. The Brook Street terrane includes substantial volcanic centres and some minor limestones (probably shallow-water). The Dun Mountain-Maitai terrane contains the major Dun Mountain Ophiolite Belt (Coombs et al. 1976), and also has some limestones (calc-turbidites). In contrast, the Murihiku Terrane is dominated by volcaniclastic sediments with no limestones, and only rare volcanic horizons. It has excellent biostratigraphic subdivision (Ballance & Campbell 1993), whose faunas closely resemble those of the Teremba Terrane of New Caledonia (Campbell et al. 1985). Extensive references and details of biostratigraphy, geochemistry and geochronology of the Eastern Province terranes that are relevant to possible correlations with their New Caledonia counterparts are given in Mackinnon (1985), Roser & Korsch (1988, 1999), Adams et al. (2007). The relative position of the terranes with respect to the Gondwanaland continental margin, suggests that several, especially the Torlesse composite terrane, are suspect terranes i.e. tectonically displaced from elsewhere along the Gondwanaland margin. Original sedimentary depocentres have been suggested in the New Zealand-West Antarctic region (Cawood et al. 1999, Wandres et al. 2004a,b). Alternatively, original depocentres in the northeastern Australian sector have been suggested (Ireland 1992, Pickard et al 2000, Adams et al. 2007), where there are superior matches of Eastern Province detrital zircon age patterns with appropriate sediment sources.

Despite their similarities in age, tectonic setting, sedimentary petrography and biostratigraphy, the exact relationships between New Zealand and New Caledonia terranes remain unclear. The disposition of New Caledonia terranes with respect to the Gondwana continental margin suggests that a suspect terrane scenario is also possible, similar to that described above for the Eastern Province of New Zealand. Thus to investigate their connection further, we present here new geochemical and detrital zircon age data for greywackes from three pre-Late Cretaceous terranes in New

Caledonia, and compare their sediment provenances with those from terranes of similar age and tectonic association in New Zealand.

NEW CALEDONIA: GEOLOGICAL OUTLINE

Two major terrane groups are distributed along the length of New Caledonia (Fig.1): an older, Late Permian to Early Cretaceous group of three subparallel, elongate terranes on the west coast (*Teremba*) and in the central mountain chain (*Koh-Central,* and *Boghen*); and a younger Late Cretaceous to Oligocene group, overlying the latter, that formed in response to break-up, drift, and subsequent collision of, an island arc (Aitchison et al, 1995). The pre-Late Cretaceous terranes were formed during a period of accretion, and show the closest biostratigraphic correspondences with Eastern Province terranes of New Zealand.

The three terranes that form the central mountains of New Caledonia are as follows:

(1) Koh-Central Terrane: a disrupted, Early Permian ophiolite suite occurs locally along the centre of the island, comprising gabbro, dolerite, rare plagiogranite, IAT and boninite pillow basalt, and undated chert directly overlying the pillow basalts (the Koh ophiolite of Meffre et al. 1996). The Koh ophiolite rocks are closely associated with a thick deep-water succession of volcano-sedimentary rocks: black shale, volcaniclastic turbidite (greywacke), radiolarian-bearing siltstone and chert. These sequences are regarded as a single terrane (Meffre et al. 1996; Aitchison et al., 1998). The black shales are several hundred metres thick, whilst greywackes are generally associated with 20-50% argillite, giving this terrane a distal and deep-water character. The

greywackes are exclusively composed of volcanic lithic (andesite and basalt) and mineral clasts (feldspar, quartz, amphibole, etc.), and plutonic clasts are generally absent, except for one locality (late Early Cretaceous). Middle Triassic (Anisian), and Late Jurassic faunas are correlated with those of the New Zealand Murihiku Terrane (Campbell et al., 1985; Meffre, 1995). Recently, a fossiliferous succession at Pouembout, formerly considered Late Jurassic, is now considered Early Cretaceous (H.J. Campbell (pers. comm.).

(2) Teremba (formerly Teremba-Moindou) Terrane: a succession of very low-grade (zeolite facies), Late Permian to mid-Jurassic, shallow-water, volcaniclastic (calc-alkaline, island arc-derived, andesitic) sedimentary rocks and volcanics (andesites, dacites and rhyolites). The sedimentary rocks are typically medium grain greywackes with only minor (<10%) intercalated argillite, some shallow water volcaniclastic conglomerate and rare black shale, a few tens metres thick. The mineral composition of greywackes is closely similar to that of Central Terrane and similarly lack plutonic clasts. This terrane also contains abundant faunas resembling those of the Murihiku Terrane of New Zealand (Grant-Mackie et al., 1977; Paris 1981, Campbell, 1984, Ballance & Campbell, 1993).

(3) Boghen Terrane: (the *ante-Permien* of Paris, 1981), an accretionary complex comprising schistose unfossiliferous, volcano-sedimentary rocks (pillow basalts, chert, black shale, sandstone, tuffs, turbiditic greywackes, and mafic melange), at a metamorphic grade (lower greenschist to blueschist facies) that is notably higher than the adjacent terranes. Late Jurassic metamorphic ages

(ca. 150 Ma, whole-rock K-Ar) of the blueschists and metabasalt (Blake et al., 1977) suggest a minimum mid-Jurassic age for metamorphism, and Early Jurassic detrital zircon ages (Cluzel & Meffre, 2002) set a maximum depositional age for the original sediments. However, zircon U-Pb ages of this present work infer a much younger maximum depositional age at ca. 135 Ma (Early Cretaceous). This discrepancy may arise from limitations of the K-Ar whole-rock dating method used (Blake et al. 1977), where presence of excess Ar is possible, and thus the Late Jurassic metamorphic age is rejected here.

Since Triassic to Early Cretaceous shallow-water volcaniclastic sediments occur to the west, and deeper-water sediments (with the same origin) to the east, and volcanic rocks and shallow intrusions are absent in the Central Terrane, Meffre (1995) and Cluzel & Meffre (2002) have suggested that the Teremba and Central Terranes are respectively the onshore and offshore parts of the same fore-arc basin. This view is also supported by a westwards-increasing metamorphic gradient in the HP-LT Boghen terrane (Guérangé et al., 1975; Paris, 1981), thus implying westwards-dipping Mesozoic subduction.

Unconformably overlying the three above-mentioned terranes, there is a prominent Late Cretaceous (Coniacian to Maastrichtian), volcanosedimentary unit (classically referred to as *Formation à Charbon*) composed of marine shallow water sandstone, coal-bearing siltstone, tuffs and volcanic rocks. Sandstones of this unit contain detrital zircon populations which have a dominant (c. 70%) component at 90-140 Ma, and a minor (c. 25%) component at 170-240 Ma (Aitchison et al., 1998). From probable correlative (Late Cretaceous) sandstones at Dumbéa River, Aronson & Tilton (1971) obtained discordant U-Pb zircon data that suggested dominant Late Cretaceous, and accessory Precambrian (>1000 Ma) age components. The occurrence of unconformable Late Cretaceous sediments upon terranes whose greywackes contain reworked Early Cretaceous zircons suggest that the pre-Late Cretaceous terranes were amalgamated in early Late Cretaceous time.

TECHNICAL METHODS

Samples were initially collected for geochemical and isotopic analysis of both sedimentary rocks, and volcanic horizons in the three New Caledonia terranes. The analytical procedures relating to this study are described in the Appendix 1.

A small group of representative sandstone samples from the three basement terranes, and the Cretaceous cover sequences, were also collected for detrital zircon studies, preferably from localities, or general areas where there was reasonable biostratigraphic control. Details of detrital zircon preparation procedures, LAM-ICPMS dating techniques, and U-Pb data treatment are listed in Appendix 1.

GEOCHEMISTRY OF GREYWACKES AND VOLCANIC ROCKS

Geochemical analyses of 16 volcanic rocks from Teremba Terrane and 21 greywacke samples from Teremba and Central Terranes are used here to constrain their origins. Permian volcanic rocks of the Teremba Terrane are mainly represented by ash fall deposits and/or pyroclastic flows (surge deposits) with occasional massive rhyolite and andesite, whereas Mesozoic volcanics (mainly Triassic) are dacitic to rhyolitic with many hypabyssal intrusions and only a few subaerial volcanic rocks and rare pillow lavas. In the Central terrane, the only volcanic rocks are scarce, massive, island-arc basalts (Meffre, 1995). Consistent with field observations, the major element compositions range from basalt-andesite to rhyolite (Table 1b). However, the trace element patterns allow tholeiitic and calc-alkaline suites to be distinguished. REE patterns (Pearce, 1982, not presented) for tholeiites are generally flat and slightly depleted in LREE, but, in contrast, calc-alkaline rocks are typically enriched in LREE (La to Sm), with the rest of the pattern similar to that of tholeiites. On a REE/trace element expanded spider-diagram (Sun & McDonough, 1989) (Fig. 2), all these rocks are enriched in LILE and typically display a prominent negative Nb-Ta anomaly, of which tholeiites (island-arc tholeiites) have the lowest incompatible element content.

Except for the occurrence of biogenic carbonate in some samples, that result in relatively low SiO_2 and high CaO contents (Table 1a), the greywackes, that are almost exclusively composed of volcanic lithic and mineral clasts, logically display geochemical features that are strikingly similar to those of the volcanic rocks. However, on average, the volcanic rocks sampled here are probably more mafic than the bulk of the sediment sources of the greywackes. A few of them display almost flat REE patterns, whereas the rest are enriched in LREE to various degrees. However, the bulk

REE content is more variable in the volcaniclastic sediments than in volcanic rocks, a possible consequence of limited dilution by weathering products and pelagic sediments. REE/trace elements patterns are closely similar to that of volcanic rocks (Fig. 2) and similarly indicate a volcanic-arc origin. Owing to the clastic mineral composition and similar geochemical features, greywackes and volcanic rocks appear to be derived from a similar magmatic source. Considering the westward coarsening and absence of erosion features within Mesozoic series, the greywackes are most likely derived from the erosion of volcanic rocks and coeval plutonic or shallow intrusive rocks which are now located to the west of present-day New Caledonia, e.g. in the Lord Howe Rise (Cluzel & Meffre, 2002).

ND-SR ISOTOPE GEOCHEMISTRY OF GREYWACKES

12 greywacke samples were selected for isotope analysis in order to identify their source rocks. In order to remove the biogenic carbonate which is obvious in some greywackes, all analysed samples have been leached with cold acetic acid. Most of them plot within a very narrow range of variation (Fig. 3) with positive εNd ($+0.9 < \varepsilon Nd < +3$) and low εSr ($-4 < \varepsilon Sr < +25$) values, that are typical of magmatic rocks derived from an undepleted mantle source with no evidence of contamination by sediment or continental crust rocks. Two samples display slightly negative εNd values ($-6.7 < \varepsilon Nd < -2.8$) whereas εSr remains only slightly positive ($+9.5 < \varepsilon Sr < +25$), implying a very limited contamination by a lower continental crust component. Only one sample displays a positive εSr (+212) together with a high Th content (13.8 ppm) consistent with the

involvement of a terrigenous (sedimentary) component, either by contamination of the mantle source, or more probably by mixing of the volcaniclastic component with a small amount of terrigenous argillite. It is worth noting that such differences in isotope ratios are not accompanied by noticeable geochemical changes (see Fig 2).

In summary, the Mesozoic greywackes are derived from a volcanic-arc source with almost no contamination by continental crust or pelagic sediment. As already pointed out by Meffre (1995), the original material (andesite, dacite and/or rhyolite) is similar to that of most intra-oceanic volcanic arcs; therefore, Permian-Mesozoic volcanic-arc magmas may have been erupted through an oceanic lithosphere or a thinned/intermediate continental crust rather than in a "normal" continental active margin. If this is the case, then any older zircons (pre-Permian) must be recycled either from older sediments derived from continental sources, or entrained as xenoliths within deep primary sources of unknown location. Thus, it appears likely that, as proposed by Cluzel & Meffre (2002), Central and Teremba terrane sediments accumulated in a fore arc region, partly upon a trapped oceanic crust element now represented by the Koh ophiolite (Fig. 1).

DETRITAL ZIRCON GEOCHRONOLOGY

Detrital zircon U-Pb age data for greywackes from nine localities (Table 3) in three New Caledonia terranes are presented in three forms.

Firstly, in Figs. 4-1 to 4-9, all ^{206}Pb/^{238} zircon ages are treated with equal weight as combined probability density/histogram diagrams for each sample. These diagrams show individual points of detail well, but taken together, the nine diagrams are difficult to compare visually. Thus, secondly, a summary table (Table 4) lists only those ages that form statistically significant components on the probability density plots of Fig. 4 (see also Appendix 2), and these are then displayed in Fig. 5, taking into consideration their proportional contribution to the total zircon set. Thirdly, in Tables 5A, and 6A, *all* ages of the New Caledonia age datasets are used, by displaying the percentage of the zircon ages that fall within selected geological periods. In these diagrams, the data are compared with published datasets from New Zealand Eastern Province terranes (Table 5B) and selected northeastern Australian terranes (Table 6B) (Adams et al. 2007, Korsch et al. 2008 in press).

Formation á Charbon

Sandstone at locality (*1*), correlative with *Formation à Charbon* nearby, has dominant Cretaceous (>80%), and a minor, Triassic-Jurassic (12%) zircon groups, but few (5%) Precambrian zircon ages (Fig. 4-1, Fig. 5, and Table 5A). The small, youngest zircon age component, 85±2 Ma, is in agreement with the estimated Coniacian-Santonian age, but this is overwhelmed (>70%) by several mid- and Early Cretaceous subcomponents, 95±1, 102±4,110±2, 119±2 and 130±2 Ma. These latter clearly reflect reworking of a long-lived active Cretaceous igneous province, relatively isolated from older, ‘continental’ inputs. Whilst the youngest zircons are probably derived from contemporaneous, dacite-rhyolite volcanic sources, c.85 Ma, it is probable that the older dominant group at 100-120 Ma reflects erosion not only of older parts of the igneous province but also reworking of detrital zircons from underlying Albian greywackes, such as those at locality (*2*) (see below). The latter might also contribute the few inherited, Precambrian zircons.

Central Terrane

Central Terrane greywackes at localites (*2*) and (*3*) have quite dissimilar detrital zircon age patterns.

The locality (2) was originally mapped as a Late Jurassic succession within the terrane, but arising from the new Cretaceous zircon age data below, a closer search yielded Early Cretaceous fossils (H. Campbell pers. comm.). Its zircon age pattern is similar to that of Formation á Charbon at locality (*1*), with dominant Cretaceous (>80%), and minor (11%) Precambrian, groups (Fig. 4-1, Fig. 5, and Table 5A). Within the Cretaceous group, the youngest statistically significant age component, 108±2 Ma, is the major one, and provides a maximum Albian age for deposition, supporting the new fossil age assignment.

In contrast, the Late Jurassic locality (*3*) has far fewer (28%) contemporary zircons (a single statistically significant component is 162±3 Ma), and a dramatically increased early Paleozoic-Precambrian proportion (>70%), with age components at 513±5, 539±6, 557±5, and 592±5 Ma.

Boghen Terrane

The zircon age pattern for the Boghen terrane greywacke (*4*) is similar to the Late Jurassic, Central (*11*), and Late Triassic Teremba (*6*) Terrane samples, having low (<25%) proportions of contemporary zircons, and high proportions (>40%) of inherited, early Paleozoic-Precambrian zircons (Table 5A). Significant older zircon component ages are Cambrian-late Neoproterozoic, 505±4, 563±6, and 584±5 Ma, similar to those in Central (*3*) and Teremba (*5, 6, 8*) Terrane samples. At this locality, the greywacke depositional age is uncertain, but the youngest zircon age group, at 170±2 Ma (which is just statistically significant), suggests a Middle Jurassic maximum. However, three younger individual ages, 137±2, 141±2 and 149±2 Ma reduce this to Early Cretaceous-Late Jurassic.

Teremba Terrane

The Teremba Terrane samples from localities (*5*)-(*8*) have their youngest zircon ages close to their estimated Middle-Late Triassic depositional ages (Figs. 4-5 to 4-8, and Table 5A), and with the exception of locality (*8*), these form statistically significant age components. They thus probably reflect contemporary volcanic-arc sources. This would be particularly true of greywacke at locality (*7*), which unlike the remainder of the terrane samples, has an extremely high proportion (96%) of Triassic zircons, with the youngest age component, comprising 33% of the total, at 225±2 Ma (Late Triassic, Norian). An age discrepancy is apparent in the sample from locality (6). This is mapped within an area of Middle Triassic rocks (237-245 Ma), although four zircon ages c. 215 Ma (Fig. 5) are clearly younger than this, and suggest that the sample is from a horizon no older than Late Triassic (Norian). With the exception of locality (7), the remaining Teremba Terrane samples have major proportions (>50%) of early Palaeozoic and Precambrian zircons and several statistically significant age components falling in the latest Neoproterozoic, c. 550-590 Ma (Fig. 5).

DISCUSSION

None of the New Caledonia terranes have sandstones with detrital zircon age patterns sufficiently distinctive to discriminate one terrane from another (Fig. 5). Rather, all the zircon patterns fall between two extremes: those dominated by contemporary, volcanic (Fig. 5: *2, 7*) sources, and those by inherited, continental (Fig. 5: *4, 8*) sources. In this sense, it could be argued that all the terranes had broadly similar depocentres, capable of providing both substantial contemporary volcaniclastic detritus, from island-arc centres (perhaps local) and terrigenous clastic material from an old hinterland of continental character (perhaps more distant). However, the sandstones dominated by contemporary volcanic inputs are more typically Cretaceous, whilst those dominated by inherited inputs are all pre-Cretaceous. This may indicate that New Caledonia became more isolated from direct continental zircon sources in the late Early Cretaceous, probably at a time of extension, before major rifting created Tasman Sea ocean floor at c. 85 Ma (Santonian). Alternatively, the contemporary Cretaceous volcanism may have been so dominant as to completely overwhelm any continuing continental zircon inputs. The zircon sources of the contemporary volcanic and older inherited continental components are thus discussed separately below.

Contemporary zircon sources for sediments in the New Caledonia region

Those youngest zircon age components in the Central and Teremba terrane greywacke samples that overlap estimated depositional ages, probably originate in contemporary volcanic centres and, given the first-cycle immature nature of the sediments, are probably of local origin. Substantial volcanic centres of appropriate age and composition are absent in New Caledonia, and one must speculate that these are now either entirely eroded away or hidden elsewhere in a hinterland (in Cretaceous times) of the Norfolk or Loyalty Ridges and/or northern Lord Howe Rise. Early Triassic diorites and granodiorites, perhaps connected to volcanic centres, do occur on the Dampier Ridge, and southern Norfolk Ridge (McDougall et al. 1994, Mortimer et al. 1998), but pre-Cretaceous rocks are not known from either the Loyalty Ridge or northern Lord Howe Rise. None of these regions appears to have Late Triassic-Jurassic rocks, of appropriate extent or composition, to provide zircon sources for New Caledonia sediments. For the Late Jurassic-Early Cretaceous sediments, the acidic volcanic centres of Whitsunday Islands, Queensland, which might extend north and south along the northern Lord Howe Rise and Marion Plateau, would provide far more suitable zircon sources. In addition, mid-Cretaceous rhyolites are known from the southern Lord Howe Rise (McDougall and Van der Lingen 1994). To provide zircons for the New Caledonia terrane depocentres from adequate sediment sources, we must therefore speculate that offshore island-arc volcanic centres of Late Triassic to Early Cretaceous age, which are now hidden, once existed along the northern Lord Howe Rise and Marion Plateau. In addition these centres might have formed an intermittent barrier to rivers originating in eastern Gondwanaland which supplied the older, continental zircons.

Inherited continental zircon components

It is notable that the older (>250 Ma), zircons in the New Caledonia sediments are overwhelmingly (>90%) early Paleozoic and Precambrian (mostly 500-700 Ma). In particular, there are few individual zircons in the Middle Permian-Early Triassic, 245-270 Ma (Figs. 4, 5) age range, and none constitute statistically significant age components. This is surprising, because voluminous plutonic (and volcanic) complexes of this age (and also Early Permian-Late Carboniferous) are extensive within the New England Orogen, along 2000 kilometres of the northeastern, present-day, margin of Australia (Veevers 2000). This fold-belt would be have been undergoing uplift and erosion at this time, sufficiently to supply marine depocentres at the Gondwana continental margin at a latitude similar to present-day New Caledonia. This is indeed the case for Permian-Triassic volcaniclastic sedimentary rocks of the Gympie Terrane of southeast Queensland (Table 4), now situated between the main plutonic/volcanic arcs of the New England Orogen and New Caledonia in its present position (Korsch et al., 2008 *in press*). In addition, the petrological, geochemical, mineralogical, faunal and particularly detrital mineral evidence (Pickard et al. 2000, Adams & Kelley 1998, Adams et al. 2007), indicate that the depocentres of several New Zealand Permian-Jurassic, Eastern Province tectonostratigraphic terranes developed at these latitudes (Fig. 6). Their sedimentary rocks always contain substantial proportions of Early Triassic-Late Permian zircons and micas, c. 245-270 Ma. Depocentres such as those of the Gympie Terrane of Australia and the Eastern Province terranes of New Zealand, would thus explain the absence of Late Permian-Early Triassic zircons in New Caledonia rocks, by providing an effective sediment trap inshore of New Caledonia. There is the additional possibility that present-day Zealandia continental fragments such as the Lord Howe Rise, Marion Plateau, and Queensland Plateau might have existed then, and were elevated, to provide an additional barrier.

However, the early Paleozoic and Precambrian zircon components in New Caledonia sediments clearly indicate major access to older continental sources. The same is true of Late Paleozoic (probable Carboniferous) terrane metasediments of the Shoalwater and Wandilla terranes in eastern Queensland (Table 6, Korsch et al., 2008 *in press*). In contrast, pre-Carboniferous zircons are rare in the Permian-Triassic rocks of the Gympie Terrane (Table 6). It is possible that Early Paleozoic and Precambrian zircons might have originated locally in basement rocks now hidden under Cenozoic cover on the northern Lord Howe Rise, Marion and Queensland Plateaux, but in the absence of any evidence, this is purely speculative. It is perhaps more realistic to look to more distant, interior sources along the Gondwana margin, where early Paleozoic (470-550 Ma) zircons could clearly originate from Early Ordovician granitoids and Cambro-Ordovician rhyolites of the Mt Windsor Volcanics in the Charters Towers Province (Veevers 2000). However, the origin of the Precambrian zircons is more problematical; for the major part, they could be recycled from Paleozoic metasediments (Cambrian-Carboniferous) in the Charters Towers, Broken River and Hodgkinson Provinces of northeastern Queensland. In addition, there are also potential primary igneous sources, mostly late Paleoproterozoic and early Mesoproterozoic metavolcanics and gneisses (1500-1800Ma), in the Georgetown, Coen and Yambo Precambrian inliers of the same region (Blewett et al. 1998). However, no primary igneous sources for the late Mesoproterozoic-early Neoproterozoic (950-1150 Ma) zircons are known.

Comparison of New Caledonia and New Zealand terranes

Similar to the New Caledonia sandstones, Eastern Province terrane metasediments of New Zealand share the same division between contemporary (probably volcanic) and inherited (probably continental) zircon sources. Like New Caledonia, there is difficulty in locating extensive volcanic sources of appropriate composition. The inherited zircon inputs are quite different in their proportions, and this feature suggests that the two regions occupied different positions at the eastern Australian Gondwanaland margin in Permian to Cretaceous times. Although now distant, New Zealand depocentres were then much closer to the New England Orogen, whilst New Caledonia, now adjacent, was formerly remote from it.

TRIASSIC-JURASSIC COMPARISONS

Triassic-Jurassic, Teremba Terrane rocks have tectonic associations and faunal assemblages similar to the New Zealand Murihiku Terrane (Campbell 1984, Ballance & Campbell 1993). However, in the latter, the major to dominant (40-80%) zircon age components are close to the depositional age, characteristic of an active volcanic margin setting. In the Teremba Terrane however, these youngest zircon groups are usually diminished (<25%) and there is instead a substantial component (usually >50%) of inherited early Paleozoic-Precambrian zircons. This latter feature is quite unlike any Permian, Triassic or Jurassic examples from the Murihiku Terrane (Table 5B, MATI4, PIOX5, HURW4 respectively). The proportion of early Paleozoic-Precambrian to Triassic-Permian zircons in the Teremba Terrane samples is particularly high, ratio >2.0 (Table 5A), and cannot be matched in any New Zealand terranes, where the ratio is always <1.0. The closest comparisons are in the New Zealand Torlesse Terrane, where

Triassic samples (Table 5B, RBW1 to PUD1) are the most zircon-rich, carry the highest inherited zircon component (>40%), and the ratio is c. 0.7, e.g. Table 5B, NGQ2. A sole exception to this behaviour occurs in the Akatarawa microterrane (a 1 km^2 enclave within the Torlesse Terrane) at a Late Permian locality (Table 5B, TAKA10), where the zircon pattern (with ratio, c. 2.0) resembles that from the Late Triassic, Teremba locality (5). Significantly, the microfaunas in this microterrane are considered of Tethyan type (Hada et al. 1995) i.e. of more northerly, lower-latitude origin than that of surrounding Torlesse rocks. (An attempt to pursue this comparison further was unsuccessful, as several Teremba terrane samples of similar Late Permian age were found to be exceptionally zircon-poor and unfavourable for detrital zircon study).

Like the New Caledonia examples, volcanic sources for contemporary zircon inputs into Triassic or Jurassic depocentres of the New Zealand Eastern Province terranes are rarely seen, and where present they are often very minor. This is surprising, as the coarse, first-cycle, immature nature of the sediments suggests short transport from local sources. For this reason, the terranes are considered 'suspect, i.e far-travelled, and tectonically transported from sediment depocentres formerly much closer to the Australian (or Antarctic) Gondwanaland margin.

CRETACEOUS COMPARISONS

New Caledonia Cretaceous sedimentary successions have two potential points of comparison with New Zealand: (1) Early Cretaceous rocks form a major part of the Torlesse composite Terrane, as basement accretionary complexes (e.g. Pahau terrane) in eastern North Island and northeastern South Island, and (2) Late Cretaceous successions are locally present at the base of widespread Cretaceous-Cenozoic cover rocks throughout New Zealand, and also within the Northland, Mt. Camel, and East Cape allochthons of the North Island (Fig. 6, Table 5B) (Suggate 1978). Similar to New Caledonia counterparts, the Cretaceous Torlesse greywackes (Table 5B, Pahau Terrane section) all carry significant proportions (>30%) of early Paleozoic and Precambrian zircons, but in contrast, carry an important additional component (>30%) of Triassic-Permian zircons (a distinctive feature of all Eastern Province terrane rocks) that weakens the comparison. This latter problem does not arise in Cretaceous rocks from the Northland, Mt. Camel, and East Cape allochthons (Table 5B, allochthon section), since they have fewer (<10%) Triassic-Permian zircons, but in turn, their much-diminished proportion (<5%) of early Paleozoic and Precambrian zircons also weakens any comparison too. Unlike New Caledonia there is better evidence for contemporary magmatism in late Early and Late Cretaceous time. Volcanic centres are widespread in the South Island, with major centres that include acid-intermediate magmatism at Mt Somers, Mt Mandamus and in the Clarence/Awatere river valleys, and minor horizons occur in Otago and north Westland (Suggate 1978), and offshore on the southern Lord Howe Rise (McDougall & Van der Lingen 1974). Major Mesozoic granitoid complexes of the Separation Point Batholith of Nelson (and its counterpart in Fiordland) and the Paparoa Suite of north Westland (Muir et al. 1994, 1996) almost certainly supplied contemporary volcanic centres, now uplifted and removed. On this basis, the comparison of New Zealand with New Caledonia during the Cretaceous is poor. Whilst having major volcanic/plutonic late Early and Late Cretaceous zircon sources nearby, the New Zealand sediments maintained access to older continental zircon sources, (1) by recycling of older zircons from underlying Permian-Triassic and early Paleozoic basement rocks within the New Zealand region, and (2) perhaps more distantly, from primary igneous sources in the southernmost part of the New England Orogen. In contrast the New Caledonia Cretaceous sediments evaded sources within the New England Orogen, yet maintained some access to older zircon sources. The latter might have been recycled from late Early Cretaceous sedimentary rocks (cf. sample NCAL10 of the Central terrane) within New Caledonia, but now largely hidden or eroded away. Prior to 85 Ma (oldest seafloor in the Tasman Sea), during the initiation of rifting in mid-Cretaceous times, the development of the extensive Whitsunday Islands (eastern Queensland) silicic volcanic province, would have provided an important zircon source. This had the additional benefit of proximity to the early Paleozoic and Precambrian provinces of northeastern Queenland. However, it must be recognised that this scenario is much weakened if one accepts a continuation, as suggested by Mortimer et al. (2008), of the New England Orogen beyond of its northernmost onshore occurrence on to the Queensland Plateau. Sediments derived from this sources in this region would then surely contain the Late Permian-Early Triassic zircon components so characteristic of the New England Orogen, but which are mostly absent in New Caledonia.

New Caledonia terranes at the eastern Australia Gondwana margin

The Late Permian-Late Cretaceous terranes in New Caledonia and New Zealand have a similar tectonic setting in an accretionary prism environment. Terrane sediments in both areas show varying combinations of contemporary, redeposited volcaniclastic and inherited, continental clastic sediment inputs. However their geographic positions relative to the Gondwanaland foreland must be quite different, with older Paleozoic-Precambrian zircon sources more apparent in the New Caledonia terranes, at the expense of the Late Permian-Early Triassic sources which dominate the New Zealand terranes. In New Caledonia, whilst the persistent contemporary volcaniclastic sediment sources are probably local, the older zircons sources are almost certainly outside the immediate New Caledonia region. The nearest available plutonic and metamorphic complexes of early Paleozoic-Precambrian age are in northeasternmost Queensland, at a point where the Australian Precambrian craton comes closest to the Pacific margin of Gondwanaland. However, it should be noted that the available age data for the northernmost Queensland Precambrian basement rocks Blewett et al. 1998), are dominantly early Mesoproterozoic, 1500-1600 Ma, rather than the younger Precambrian, 900-1100 Ma, ages more commonly seen in the New Caledonia detrital zircon sets. In this scenario, there is a requirement for long sediment transport, up to 2000 kilometres, via a river/delta/submarine canyon system, from sources that includes Cambrian-Ordovician rocks, such as those of the Broken River Province, and Neo- and Mesoproterozoic rocks, such as those in several adjacent Precambrian inliers. In the Triassic-Jurassic, any such river system must direct such sediments from these sources quite far offshore and then transport it by longshore currents into the New Caledonia region, to avoid capture of zircon sources from the northern New England Orogen (Fig. 6). This latter requirement is especially difficult, as there can be no sediment input into such longshore currents along the 500 kilomtere sector of the northeast margin of the orogen. However, Leitch et al. (2003) have suggested a similar scenario for derivation of late Paleozoic, Shoalwater and Wandilla terrane sediments in eastern Queensland from older continental sources in northeastern Queensland. The continental sediment supply must diminish substantially in Cretaceous times, either as a consequence of gradual erosion of the source areas, or the intervention of a sediment trap or barrier e.g. initiation of rift basins or volcanic arcs offshore.

Alternatively, the sediment transport may have been relatively short (c. 200km), into depocentres at the immediate Gondwana margin of northeasternmost Queensland (Fig.6). In Early Cretaceous times, such depocentres would have been be consolidated and tectonically transported southwards, as suspect terranes, by dextral strike-slip, margin-parallel displacement, outboard of the New England Orogen, and into the New Caledonia region. The Triassic-Jurassic terranes transported in this way would gradually approach a hinterland to New Caledonia, comprising local Cretaceous volcanic arcs e.g. Whitsunday Islands, Maryborough Basin, and hence become dominated by their contemporary volcaniclastic sediment inputs. Pickard et al. (2000) and Adams et al. (2007) have suggested this kind of scenario for transport the Late Palezoic–Mesozoic, Torlesse composite terrane of New Zealand from eastern Australia. However, like the New Zealand example, this scenario encounters anomalies, because the relative original positions of the New Caledonia sediment depocentres at the Gondwanaland margin would been the opposite of their final relative terrane positions in New Caledonia. The Boghen terrane, whose sediment depocentre had most ‘continental’ (inherited) zircons, would now be outboard of the Teremba Terrane, whose sediment depocentre was more local, and had the least ‘continental’ influence.

SUMMARY OF CONCLUSIONS

Geochemical and Sr-Nd isotopic characteristics of Mesozoic greywackes in the Teremba and Central Terranes of New Caledonia indicate a uniform offshore, probable subduction-related tectonic environment, with minor continental sediment contribution. Detrital zircon U-Pb age patterns for sandstones of the Formation á Charbon, and greywackes of the Central and Teremba Terranes indicate local offshore depocentres in an active margin tectonic environment, with substantial contemporaneous volcaniclastic sediment supplies in Late Triassic, Late Jurassic and particularly mid-Cretaceous times. In the Teremba Terrane, an older, inherited zircon component from continental sources is usually (but not always) important, most commonly Precambrian and Cambrian in age. In contrast, the Boghen terrane sandstones have much diminished contemporary (Late Jurassic) zircon contributions, and a major contribution (>50%) of Early Paleozoic and Precambrian zircons. In all terranes there are few late Paleozoic-early Mesozoic zircons, especially in the age range Late Permian to Early Triassic, which latter feature would thus probably exclude sediment sources from along the adjacent Gondwana margin in the northern New England Orogen. It is concluded that the primary contemporary zircon sources must lie hidden, or are now eroded, somewhere in the New Caledonia hinterland, on the Loyalty and Norfolk Ridges, or northern Lord Howe Rise and Dampier Ridge, or Marion and Queensland Plateaux. A degree of local zircon reworking, from Triassic into Jurassic, and Jurassic into Cretaceous sediments is possible. The continent-derived zircons probably have primary, and/or reworked detrital sources in Paleozoic and Precambrian rocks of northeast Queensland. Here there are several Proterozoic igneous/metamorphic inliers and Paleozoic sedimentary successions of the Charters Towers, Broken River and Hodgkinson Provinces, which are close to the Gondwana margin and beyond the northernmost extremity of the New England Orogen. The sediment supplied from these areas must have been transported southwards by longshore currents, outboard of the orogen, to depocentres in New Caledonia. Alternatively, the depocentres themselves may have originated closer to source at the contemporary Gondwana margin, and then transported tectonically southwards, as suspect terranes in Early Cretaceous times, to their present New Caledonia position. This latter scenario resembles that suggested for New Zealand Permian-Cretaceous sediment depocentres that developed close the Gondwana margin of northeastern Australia.

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FIGURE CAPTIONS:

Figure 1a: Geological map of New Caledonia basement terranes and U-Pb geochronology sampling localities.

Figure 1b: New Caledonia in the Southwest Pacific region in Cretaceous times.

Figure 2a: Expanded REE-trace elements spider-diagram normalised to the average MORB for selected New Caledonia terrane greywackes (normalising values are from Sun & McDonough, 1989). Labelled patterns refer to sediments which have slightly negative εNd (see Fig. 3 and Table 2)

Figure 2b: Expanded REE-trace elements spider-diagram normalised to the average MORB for selected Teremba terrane volcanic rocks (normalising values are from Sun & McDonough, 1989)

Figure 3: Sr-Nd evolution diagram for selected New Caledonia terrane greywackes showing remarkably constant isotopic ratios through time and the quasi-absence of contamination. Arrows with interrogation marks refer to either the array resulting from magma contamination by pelagic sediments (moderately negative εNd, high εSr); or, alternatively contamination by lower continental crust (negative εNd, slightly positive εSr).

Figure 4: Combined histogram and probability density diagrams of detrital zircon age data from nine greywackes from New Caledonia terranes, Statistically significant age components (expressed in millions of years) are shown in bold italics. Ages >600 Ma are stacked at right side. Ages < 1000 Ma are ^{238}U/ ^{206}Pb data, ages > 1000 Ma are ^{207}Pb/^{206}Pb data.

Figure 5: A summary of detrital zircon ^{238}U/ ^{206}Pb age component data from the cumulative probability diagrams (Fig. 4) of nine greywackes from New Caledonia terranes. These component age data are stacked from top to bottom in ascending biostratigraphic age order (where known), or estimated maximum and minimum stratigraphic ages derived respectively from youngest detrital zircon age components, and metamorphic ages. The height of each databox indicates the component's proportion of total (see % scale bar at right) and the width is the component age error (at 95% confidence limits. The dot-dash line is the stratigraphic age limit - all zircon data should be older than this.

Figure 6: Configuration of Eastern Gondwanaland during the Mesozoic (modified from Gaina et al. 1998; Sutherland 1999; and Hall 200), showing possible position of sources of New Caledonia terrane sediments, suggested depocentres, and their final destinations for terrane assembly. Black arrows show generally local transport of sediments derived from contemporary volcanic arc sources. Light grey

arrows show more distant transport of older, continent-derived sediments from the Gondwana margin. Two scenarios are suggested: in Fig. 6A, the continent derived-sediments are supplied to on long-shore river systems to depocentres in New Caledonia and in Fig. 6B, the continent-derived sediments are supplied to more local depocentres at the Gondwana margin, which are then tectonically transported in Early Cretaceous times, as suspect terranes, to a final destination in New Caledonia. The positions of equivalent New Zealand depocentres and terranes are taken from Adams et al. (2007).

LIST OF TABLES:

Table 1a: Major and trace element data for New Caledonia Teremba and Central terrane greywackes.

Table 1b: Major and trace element data for New Caledonia Teremba volcanic rocks

Table 2: Sr-Nd isotopic data for New Caledonia Teremba and Central terrane greywackes.

Table 3: Sample list for U-Pb zircon geochronology

Table 4: Summary of statistically significant age components in detrital zircon age patterns in New Caledonia terrane metasediments (see Fig. 4).

Table 5: New Caledonia detrital zircon ages (5A) summarised in geological periods, and compared with correlative New Zealand data (5B).

Table 6: New Caledonia detrital zircon ages summarised in geological periods (6A), and compared with correlative Australian data (6B).

Appendix I: Technical details

GEOCHEMICAL AND ISOTOPIC ANALYSES

Whole rock geochemical analysis of representative volcanic rocks and greywacke samples are by ICP-AES for major elements and ICP-MS for REE and other trace elements (Table 1) at the Service d'Analyse des Roches et des Minéraux of Vandeuvre (Centre National de la Recherche Scientifique, France), using the methods of

Govindaraju and Mevelle (1987). To avoid pollution by biogenic carbonate without affecting other mineral phases, all the greywackes samples have been leached with acetic acid prior to isotope analysis. Nd and Sr isotopic analyses (Table 2) were determined at the Clermont–Ferrand isotope laboratory by thermal ionization mass spectroscopy (TIMS) using a VG54E instrument in dynamic double collection mode and corrected for mass fractionation by normalization to ^{86}Sr/^{88}Sr = 0.1194 and ^{146}Nd/^{144}Nd = 0.7219. The Sr–Nd sample decomposition and chemical separation procedures are those of Pin and Santos Zalduegui (1997). Sr and Nd isotopic ratios were corrected for radiogenic decay according to their assumed stratigraphic age. The concentrations of Sm, Nd, Rb and Sr are given in µg/g, and the precision of ^{147}Sm/^{144}Nd and ^{87}Rb/^{86}Sr measurements are 0.2% and 2%, respectively, at the 95% confidence level. The ^{143}Nd/^{144}Nd ratio measured for the La Jolla isotopic standard during the period of analysis gave a mean value of 0.511849 (SD = 8 x 10^{-6}, *n* = 70). The εNd_i is the initial ^{143}Nd/^{144}Nd expressed as a fractional deviation in parts per 10^4 from the contemporaneous value of a chondritic (bulk earth) reservoir with present-day ^{143}Nd/^{144}Nd = 0.512638 and ^{147}Sm/^{144}Nd = 0.1966 (Jacobsen & Wasserburg 1980). ^{87}Sr/^{86}Sr ratios were normalized to ^{86}Sr/^{88}Sr = 0.1194, with an uncertainty equal to or better than ±0.00004 (two standard errors on the mean). The ^{87}Sr/^{86}Sr ratio measured for the National Institute of Standards and Technology, Standard Reference Material (NIST – SRM) 987 during the period of analysis gave a mean value of 0.71023 (SD = 2.7 x 10^{-5}, *n* = 29).

DETRITAL ZIRCON DATING

Detrital zircon dating was done at the ARC Key Centre for Geochemical Evolution and Metallogeny of Continents (GEMOC), Macquarie University, Sydney, Australia. Eight samples for detrital zircon studies were chosen from representative collections taken at stratigraphic horizons where coarse-medium greywacke and sandstone predominate, and preferably with established biostratigraphic age control (Table 3). Since these localities are in lower metamorphic grades (typically zeolite to lower pumpellyite-actinolite mineral facies), they are essentially unfoliated rocks and free of metamorphic zircon.

To minimise sample handling for zircon recovery, a 1 kg sample was collected at the field outcrop as 5 mm-size gravel, removing all weathered rinds, blemishes, inclusions and joint faces. This enabled direct crushing in a tungsten carbide swingmill 2-3 times, for 5-10 seconds, sieving at each stage through a single, 250 micron mesh sieve. The sieved material was washed and decanted several times in water, to remove mud-size fractions, thus retaining a 200-300 g sample in a ~30-250 micron size range, which was then dried. A heavy mineral concentrate was obtained from a 100 g portion in sodium polytungstate liquid, adjusted to a specific gravity of 2.95-2.98, from which about 500 zircon grains were then hand-picked as randomly as possible, i.e. taking all grains within a 1 mm microscope stage field of view. Of these, 50-100 grains were mounted in resin to be polished for LA-ICPMS (laser-ablation inductively-coupled plasma-source mass spectrometry) analysis.

Analytical protocols relating to ablation procedures, mass spectrometric analysis and data treatment are discussed in detail in Jackson et al. (2004). These authors' preferred procedures were followed in this work, using a Merchantek pulsed Nd-YAG laser, frequency-quintupled to operate at 213 nm, and an Agilent 7500S ICPMS instrument.

In all cases, the ablated spot size was in the range 30-40 microns, with the ablation time about 60 seconds, preceded by 60 seconds background measurement, and followed by 60-120 seconds washout. Groups of 10-12 zircon sample grain analyses were preceded and followed by duplicate analyses of firstly, the in-house zircon standard GJ-1, and secondly, by 1-2 analyses each of the international zircon standards, MT-1 and 91500. The GLITTER data interpretation software package (www.els.mq.edu.au/GEMOC/) enabled analysis of U, Pb and Th absolute count rates, and all relevant isotopic ratios, during the run cycle, and the elimination of unstable beam intervals, and rejection of data where zircon core regions were inadvertently encountered.

Using the laser spot size of 30-40 microns enabled age measurements to be made adjacent to crystal margins, rather than cores, and preferably, close to crystal terminations (as defined by two crystal edges). Isotopic data were continually monitored during ablation to check that zircon cores were not being intersected. Efficient use of the instrument time dictated that strongly unimodal patterns were investigated only to analysis totals of N=33-50, bimodal patterns to N=50-70, and strongly polymodal patterns to N=100 (N.B. throughout this work 'N' and 'n' refer to dataset totals and subgroups respectively). This allowed significant age groups (n) comprising >5% of the total to be revealed by three or more analyses (Andersen 2005).

Full ^{207}Pb/^{206}Pb, ^{206}Pb/^{238}U, ^{207}Pb/^{235}U, and ^{208}Pb/^{232}Th age data (and 1 standard errors) are listed in the Appendix Table 1. All ages used here are ^{206}Pb/^{238}U zircon ages where <1000 Ma, and ^{207}Pb/^{206}Pb ages where >1000 Ma. A small minority of the analyses have common Pb corrections (using protocols of Andersen 2002). The age datasets are shown in Fig. 4 as combined probability density/histogram diagrams (using a common X-axis format, 0-600 Ma, with ages >600 Ma stacked at right).

Age groupings in probability density plots of the zircon age sets (Fig. 4) were determined by visual inspection and using deconvolution (and weighted average) algorithms in the ISOPLOT-Ex (version 3.0) software (kindly provided by K. Ludwig, United States Geological Survey). The treatment of these age datasets was constrained by two conservative criteria imposed to reveal only statistically significant age groups viz. those with n>3 concordant $^{206}Pb/^{238}U$ v. $^{207}Pb/^{235}U$ ages, *and* which comprise >4% of the total population (N). This was relaxed to n≥3 for datasets with N<30. Following Andersen (2005), the age groups are discussed using five categories: 'dominant' >80%, 'large' 50-79%, 'major' 20-49%, 'minor' 5-19%, and 'accessory' <5%, of the total. A summary of the statistically significant component ages and errors, their number (n) and proportion (as %) of the total (N), is given in Table 4.

Detrital zircon age data for other previously-published and unpublished studies are collated in Tables 5 and 6, and presented with the present New Caledonia datasets. In these tables, *all* zircon age data are divided into selected geological periods. The New Zealand timescale used here is that of Cooper (2005).

Suggested Running Title: New Caledonia terranes.

Version: NCAL08text March 2009

(6771 words)

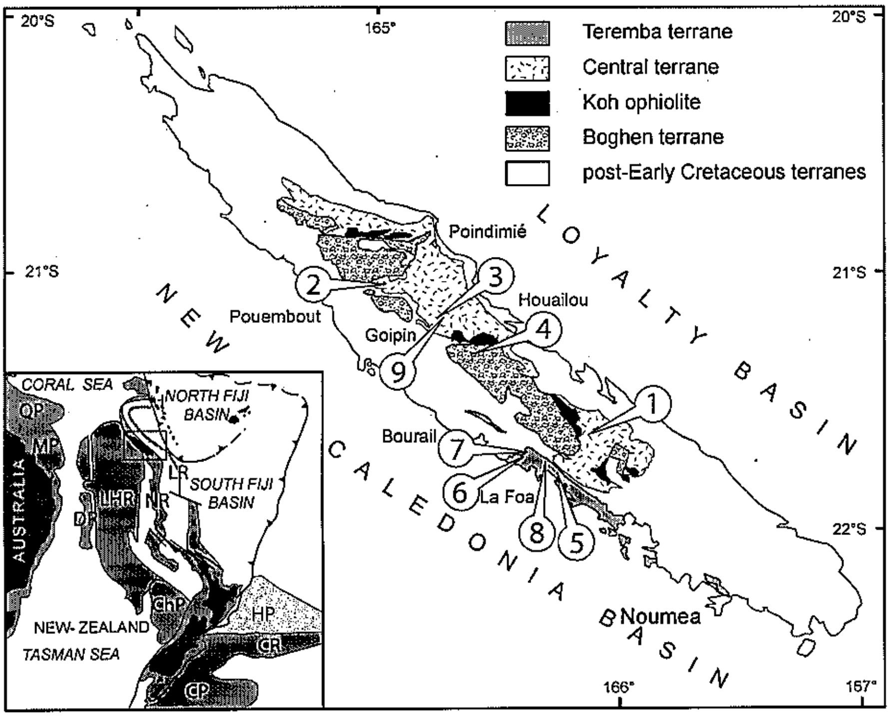

20°S
165°
20°S
Teremba terrane
Central terrane
Koh ophiolite
Boghen terrane
post-Early Cretaceous terranes
Poindimié
LOYALTY BASIN
21°S
21°S
2
3
Houailou
NEW CALEDONIA BASIN
Pouembout
Goipin
4
9
1
Bourail
7
6
La Foa
8
5
22°S
Noumea
166°
167°
CORAL SEA
QP
MP
NORTH FIJI BASIN
AUSTRALIA
LHR
NR
LR
SOUTH FIJI BASIN
DR
ChP
HP
NEW- ZEALAND
TASMAN SEA
CR
CP

Fig 1

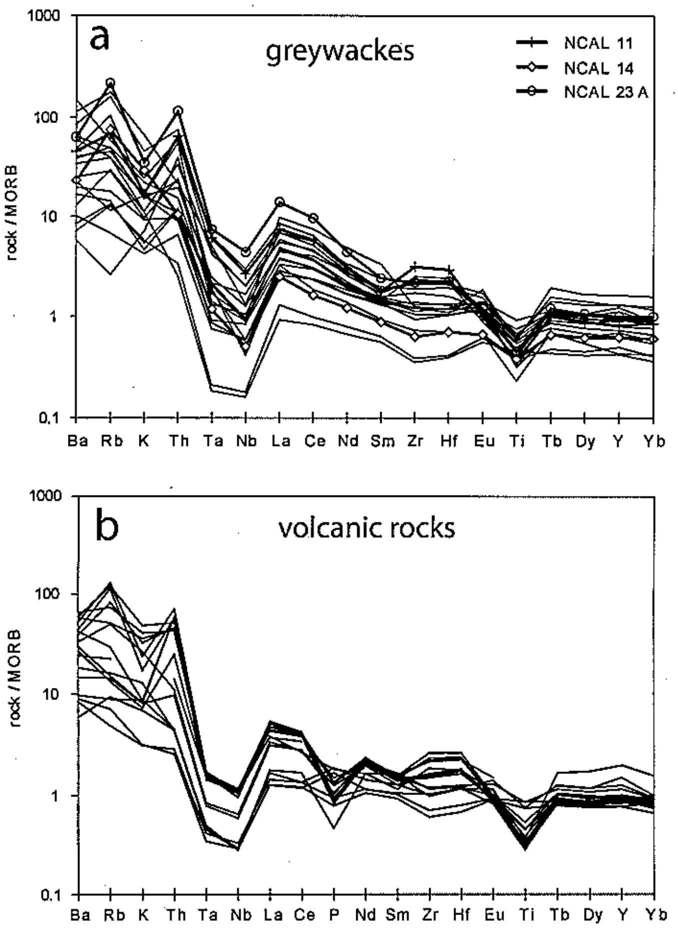
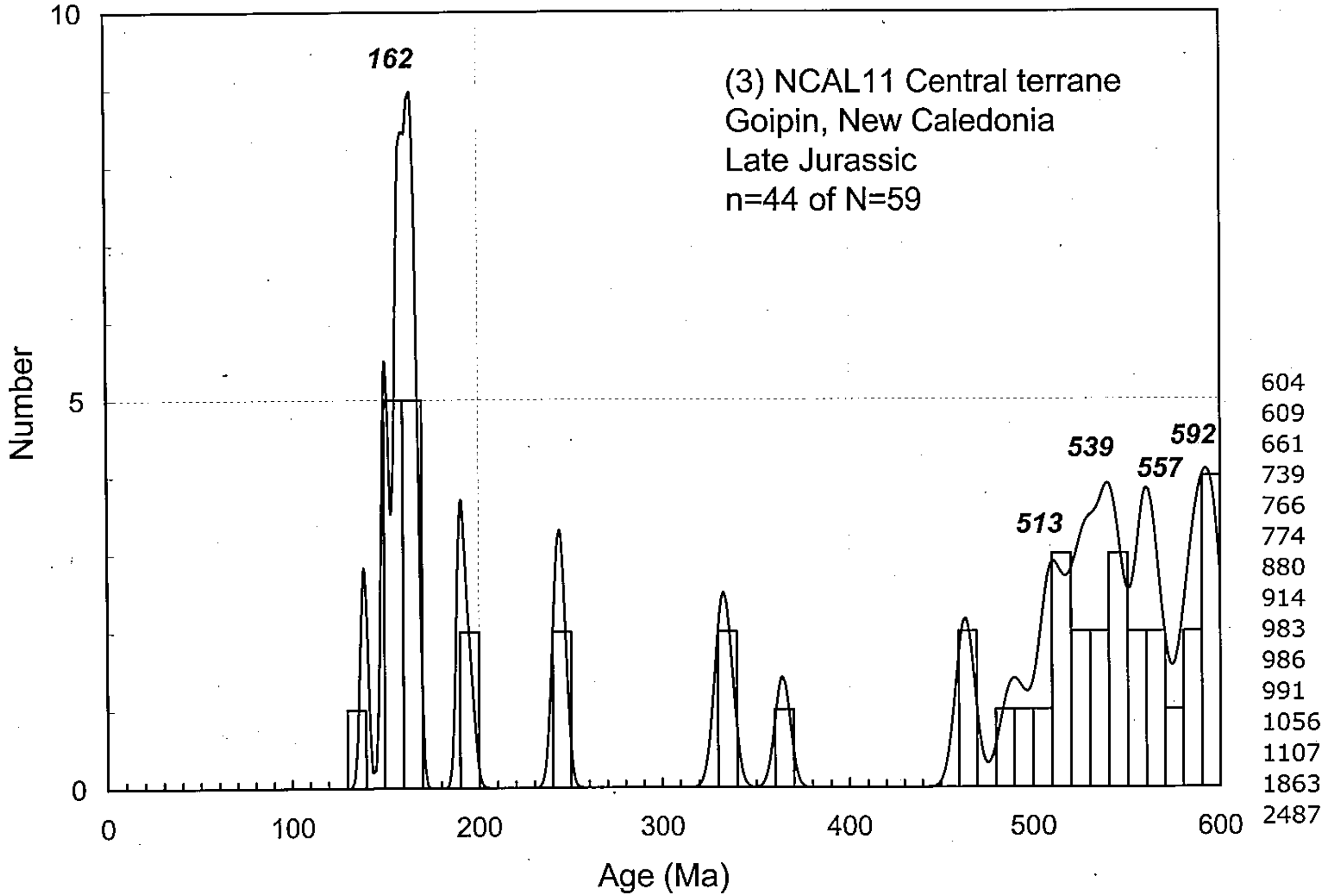
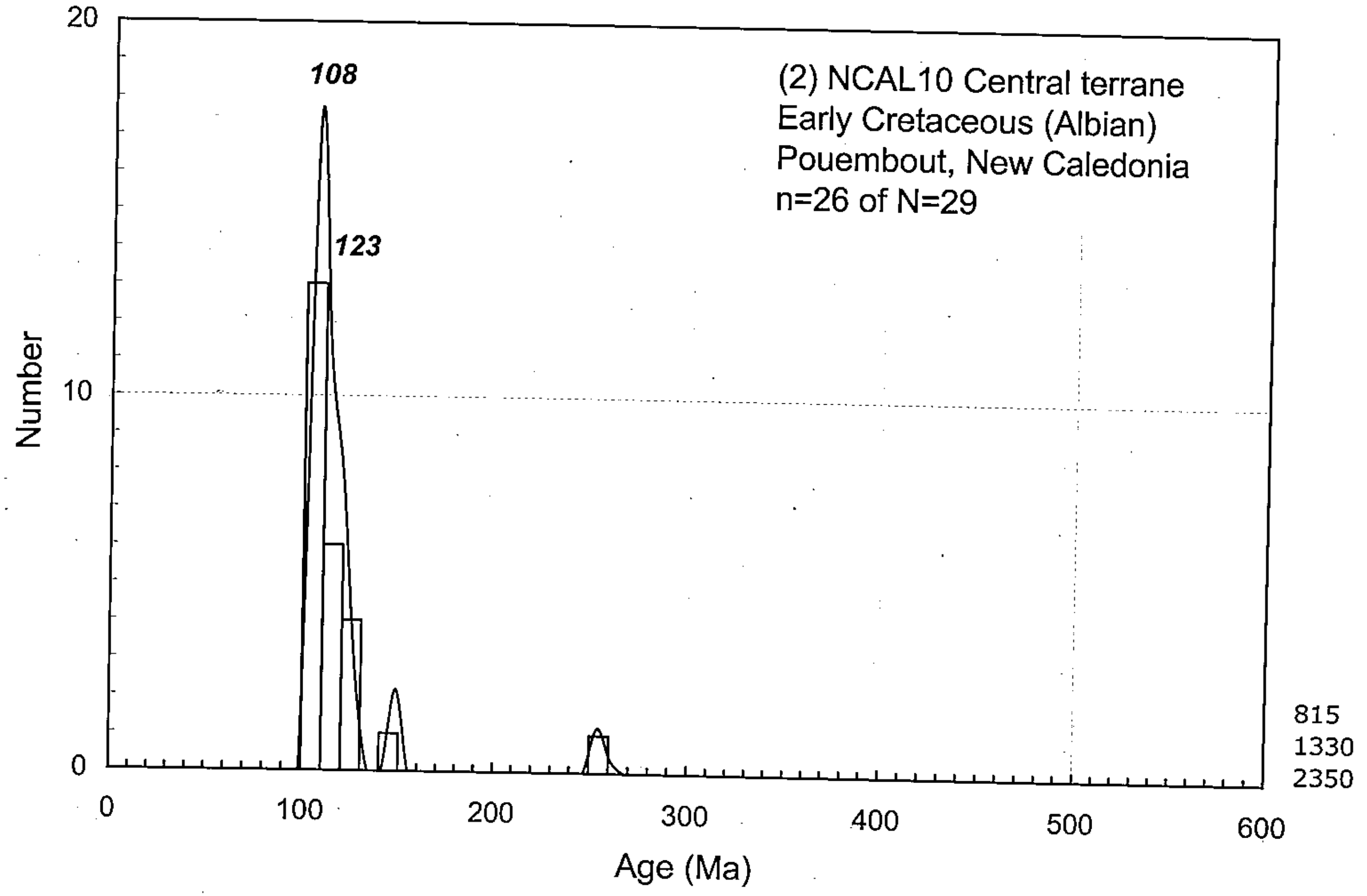
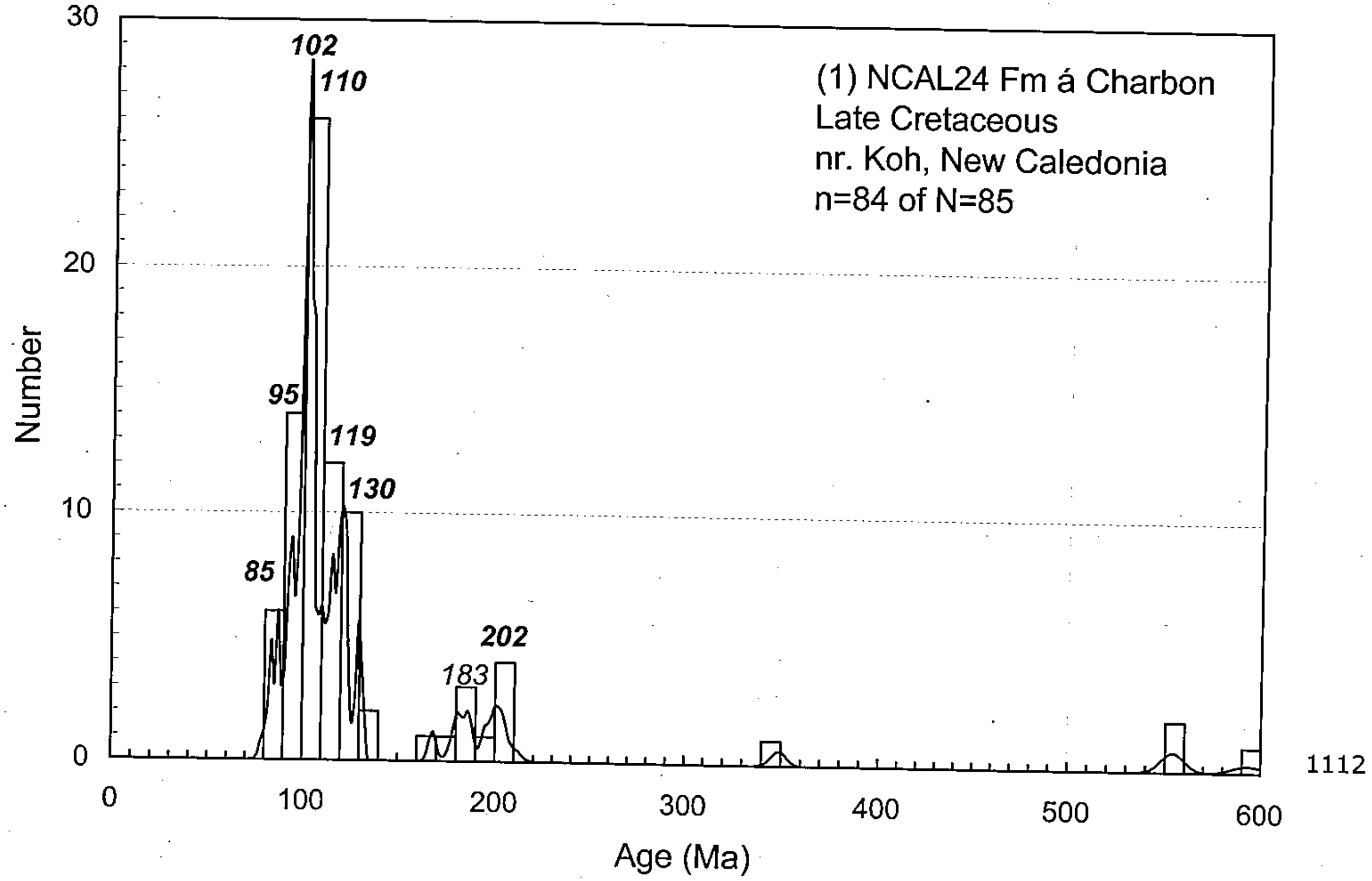
a
greywackes
NCAL 11
NCAL 14
NCAL 23 A
rock / MORB
1000
100
10
1
0,1
Ba Rb K Th Ta Nb La Ce Nd Sm Zr Hf Eu Ti Tb Dy Y Yb
b
volcanic rocks
rock / MORB
1000
100
10
1
0,1
Ba Rb K Th Ta Nb La Ce P Nd Sm Zr Hf Eu Ti Tb Dy Y Yb

Fig 2


(3) NCAL11 Central terrane
Goipin, New Caledonia
Late Jurassic
n=44 of N=59
162
513
539
557
592
Number
0
5
10
Age (Ma)
0
100
200
300
400
500
600
604
609
661
739
766
774
880
914
983
986
991
1056
1107
1863
2487


(2) NCAL10 Central terrane
Early Cretaceous (Albian)
Pouembout, New Caledonia
n=26 of N=29
108
123
Number
20
10
0
0
100
200
300
400
500
600
Age (Ma)
815
1330
2350


(1) NCAL24 Fm á Charbon
Late Cretaceous
nr. Koh, New Caledonia
n=84 of N=85
102
110
95
119
130
85
183
202
1112
Number
30
20
10
0
Age (Ma)
0
100
200
300
400
500
600

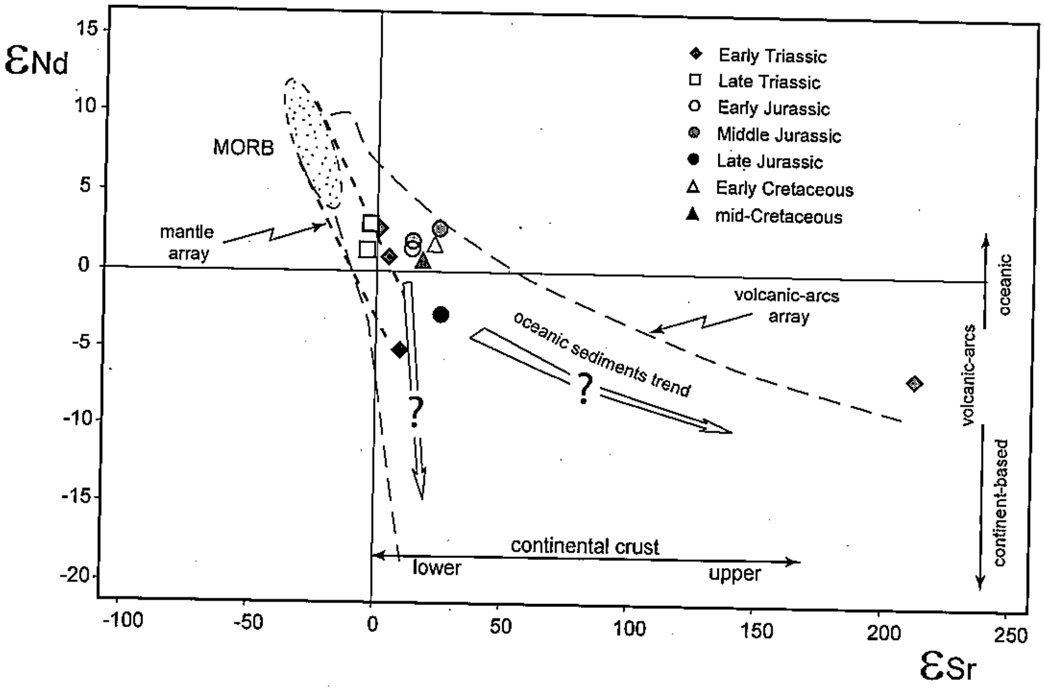

εNd
15
10
5
0
-5
-10
-15
-20
-100
-50
0
50
100
150
200
250
εSr
◆ Early Triassic
□ Late Triassic
○ Early Jurassic
● Middle Jurassic
● Late Jurassic
△ Early Cretaceous
▲ mid-Cretaceous
MORB
mantle array
volcanic-arcs array
oceanic sediments trend
?
?
continental crust
lower
upper
oceanic
volcanic-arcs
continent-based

Fig 3

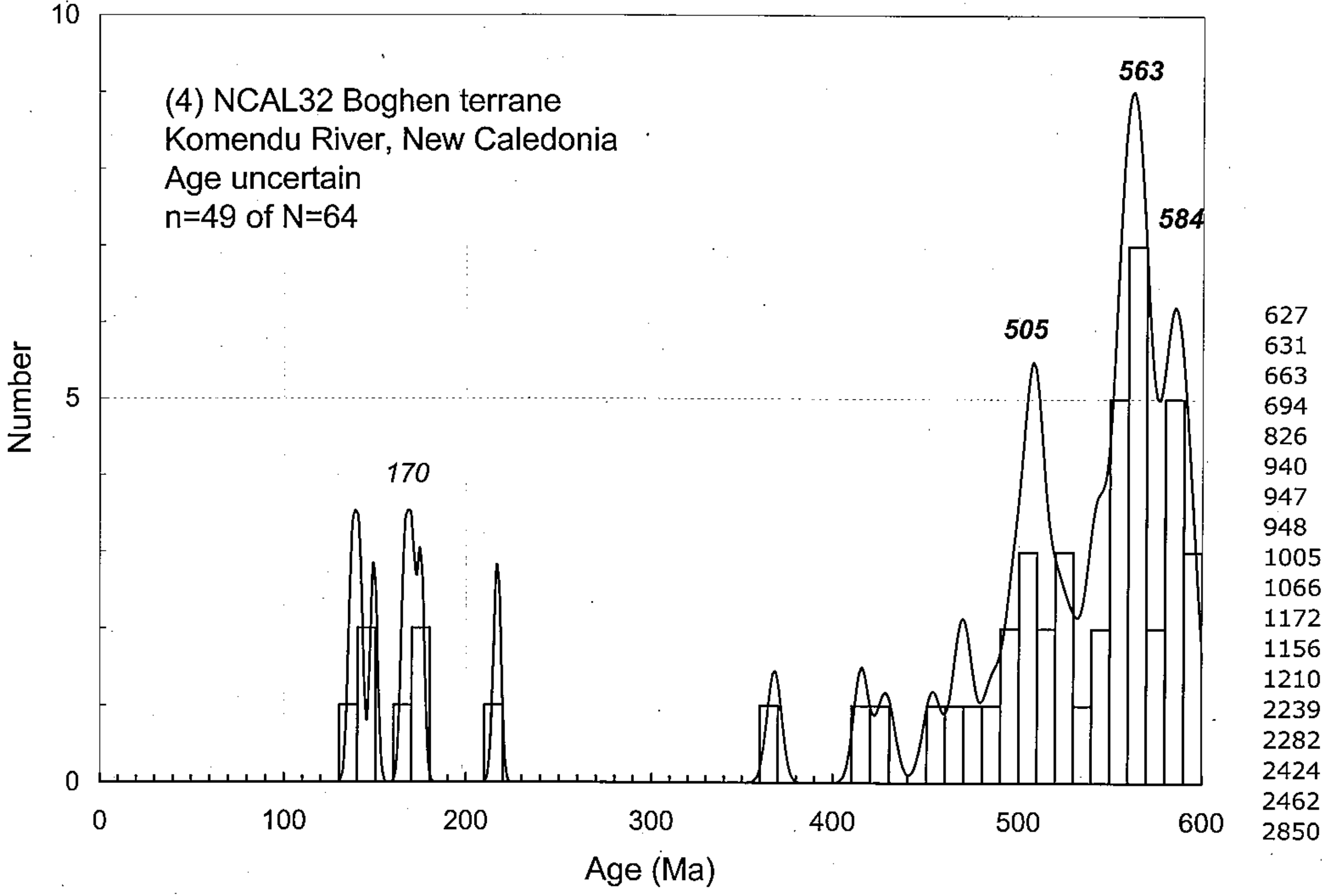

(4) NCAL32 Boghen terrane
Komendu River, New Caledonia
Age uncertain
n=49 of N=64
563
584
505
170
Number
10
5
0
0
100
200
300
400
500
600
Age (Ma)
627
631
663
694
826
940
947
948
1005
1066
1172
1156
1210
2239
2282
2424
2462
2850

TABLE 4: NEW CALEDONIA MESOZOIC TERRANE SEDIMENTARY ROCKS:
SUMMARY OF DETRITAL ZIRCON U-PB AGE COMPONENTS

Locality No./ zircon component	*Detrital zircon age component (Ma)*	±	*2e*	*% of total zircon pop.*	*zircon set total, N*
FORMATION Á CHARBON'					
(1) NCAL24 (R23485), sandstone; highway outcrop above Koh village, Late Cretaceous; Lat.21°33'48"S, Long.165°49'57"E					
aa	85	±	2	6	85
a	95	±	1	9	
b	102	±	4	33	
c	110	±	2	7	
d	119	±	2	18	
e	130	±	2	5	
f	183	±	4	5	
g	202	±	3	5	
CENTRAL TERRANE					
(2) NCAL10 (R23470), greywacke, Pouembout River, streambank outcrop, previously mapped as Late Jurassic; Lat.21°06'41"S, Lon					
a	108	±	2	57	28
b	123	±	4	18	
(3) NCAL11 (R23471), greywacke; Goipin River, streambank o/c, Late Jurassic; Lat.21°33'48"S, Long.165°49'57"E					
a	162	±	3	14	59
b	513	±	5	7	
cc	539	±	6	7	
c	557	±	5	7	
d	592	±	5	8	
(9) GHP1 (R24477), sandstone; Goipin River valley; Late Jurassic; Lat.21°13'23"S Long.161°16'11"E					
a	153		2	10	40
b	585		7	10	40
BOGHEN TERRANE					
(4) NCAL32 (R24096), carbonaceous sandstone; Komendu River, streambank o/c, age uncertain; Lat.21°19'26"S, Long.165°24'40"E					
a	170	±	2	4	67
b	505	±	4	10	
c	563	±	6	16	
d	584	±	5	7	
TEREMBA TERRANE					
(5) NCAL15 (R23475), volcaniclastic sandstone; highway near La Foa, roadside outcrop, Middle-Late Triassic; Lat.21°41'31"S, Long.165°44'50"E					
a	227	±	4	15	47

Table 3: New Caledonia Permian-Cretaceous basement terranes, greywacke and sandstone sample data

Locality	*GNS R No.*	*Field No.*	*Rock type*	*Age*	*Terrane*	*Location*	*Latitude/Longitude*
(1)	23485	NCAL24	coarse sandstone	mid-Late Cretaceous	*Fm á Charbon*	near Koh village	21°33'48"S165°49'57"E
(2)	23470	NCAL10	coarse greywacke	Albian (mapped as Late Jurassic)	Central	Pouembout River	21°06'41"S165°01'25"E
(3)	23471	NCAL11	coarse greywacke	Late Jurassic	Central	Goipin River	21°13'00"S165°14'00"E
(4)	24096	NCAL32	carbonaceous sandstone	*uncertain*	Boghen	Komendu River	21°19'26"S165°24'40"E
(5)	23475	NCAL15	volcaniclastic sandstone	Middle-Late Triassic	Teremba	near La Foa	21°41'31"S165°44'50"E
(6)	24300	TRB20	medium sandstone	Middle Triassic (Anisian)	Teremba	Col de Boghen, old RT1	21°40'45"S165°39'09"E
(7)	24301	TRB21	coarse sandstone	Middle (Ladinian)-Late Triassic (Norian)	Teremba	Moméa village	21°40'11"S165°38'54"E
(8)	24302	TRB23	coarse sandstone	Late Triassic (Norian-Rhaetian)	Teremba	La Foa, watertank	21°43'21"S165°50'17"E
(9)	24477	GHP2	coarse sandstone	Late Jurassic	Central	Goipin (track to Aoupine)	21°13'23"S165°16'11"E

Table 2: Sr-Nd isotopic data for New Caledonia Teremba and Central terrane greywackes

sample	t in Ma	(^{143}Nd/^{144}Nd) rock today	(^{147}Sm/^{144}Nd) rock today	(^{143}Nd/^{144}Nd) rock at t	CHUR at t	**ε Nd (t)**	(^{87}Sr/^{86}Sr) rock today	(^{87}Rb/^{86}Sr) rock today	(^{87}Sr/^{86}Sr) rock at t	CHUR at t	**ε Sr (t)**
Central Chain and Teremba graywackes											
NCAL 2	170	0.512800	0.2536	0.512518	0.512419	**1.93**	0.70570	0.1694	0.70529	0.70430	**14.1**
NCAL 9	105	0512685	0.2107	0.512540	0.512503	**0.73**	0.70603	0.2584	0.70565	0.70438	**18.1**
NCAL 10	140	0.512766	0.2371	0.512549	0.512458	**1.77**	0.70601	0.0374	0.70595	0.70438	**22.4**
NCAL 11	150	0.512513	0.2142	0.512303	0.512445	**-2.78**	0.70642	0.1388	0.70612	0.70432	**25.5**
NCAL 12	215	0.512926	0.2924	0.512515	0.512361	**2.99**	0.70429	0.0783	0.70405	0.70425	**-2.8**
NCAL 13	255	0.512765	0.2448	0.512356	0.512310	**0.90**	0.70472	0.0546	0.70453	0.70420	**4.6**
NCAL 14	250	0.512482	0.2620	0.512054	0.512316	**-5.12**	0.70624	0.3832	0.70487	0.70421	**9.5**
NCAL 16	225	0.512800	0.2601	0.512417	0.512348	**1.34**	0.70411	0.0492	0.70395	0.70424	**-4.0**
NCAL 19	165	0.512858	0.2709	0.512566	0.512426	**2.74**	0.70620	0.0709	0.70604	0.70431	**24.6**
NCAL 20	185	0.512765	0.2409	0.512473	0.512400	**1.43**	0.70531	0.0201	0.70526	0.70428	**13.8**
NCAL 23	240	0.512295	0.1974	0.512984	0.512329	**-6.73**	0.72493	1.6896	0.71916	0.70422	**212.2**
NCAL 25	240	0.512855	0.2464	0.512468	0.512329	**2.71**	0.70439	0.0345	0.70427	0.70422	**0.8**

Sr	201.1	149.8	514.4	184	145.4	730	462	442	241.9	244.4	27.08	173.5	91.47	49.8	144
Ta	0.212	0.216	0.203	0.188	0.209	0.206	0.046	0.055	0.111	0.104	0.060	0.198	0.061	0.066	0.226
Tb	0.640	0.576	0.677	0.611	0.634	0.631	0.529	0.588	0.778	0.856	1.122	0.550	0.708	0.592	0.694
Th	6.166	5.102	7.067	5.507	5.314	7.113	0.309	0.343	1.332	1.170	0.537	2.962	0.519	0.529	8.471
Tm	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	0.739	0.357	0.423	0.417	0.402
Y	26.96	24.05	27.72	25.67	26.45	25.74	21.62	24.97	32.44	35.51	55.79	21.67	26.45	23.23	28.51
Yb	2.447	2.334	2.630	2.413	2.530	2.487	2.025	2.264	2.835	2.932	4.795	2.534	2.948	2.912	2.766
Zr	121.8	121.2	163.8	113.8	110.5	115.5	45.1	52.48	88.7	85.9	73.3	138.0	75.7	76.66	193.8

Yb	3.842	2.327	1.642	2.601	2.746	1.761	1.839	2.006	2.703	3.069	3.034	4.769	1.282	2.550
Zr	153.8	162.1	88.89	230	68.72	53.58	46.64	101.4	96.24	170.8	160	91.68	125.5	183.2

Table 1b: Major and trace element data for New Caledonia Teremba terrane volcanic rocks.

sample	TRB4-1 Teremba	TRB4-2 Teremba	TRB3-1 Teremba	TRB1 Teremba	TRB5-1 Teremba	TRB2-3 Teremba	TRB2-1 Teremba	TRB2-2 Teremba	TRB5-21 Teremba	TRB5-22 Teremba	991 Teremba	1063b Teremba	985a Teremba	985b Teremba	LaF4 Teremba
Major elements %															
SiO_2	71.38	74.73	71.48	63.57	67.96	70.64	51.25	48.46	58.80	56.56	77.56	73.89	73.90	74.00	67.60
TiO_2	0.43	0.39	0.42	0.59	0.50	0.41	0.94	1.09	1.08	0.96	0.51	0.59	0.62	0.59	0.59
Al_2O_3	12.90	11.17	13.85	16.90	14.50	15.13	19.61	21.04	15.57	16.76	11.75	12.93	13.53	12.99	15.95
FeO	3.37	2.71	3.29	4.67	3.83	3.39	9.47	10.49	8.75	9.90	1.29	4.03	2.73	2.78	3.29
MnO	0.08	0.06	0.06	0.07	0.04	0.06	0.18	0.18	0.23	0.17	0.01	0.05	0.02	0.05	0.08
MgO	1.01	0.79	1.41	1.61	1.28	1.45	3.95	3.80	2.27	3.69	0.16	0.14	0.51	0.38	0.80
CaO	2.45	1.73	5.27	4.15	1.90	5.42	9.15	8.85	4.00	4.74	0.08	1.76	0.37	0.73	1.20
Na_2O	4.79	5.34	3.42	5.90	7.29	2.75	5.07	5.70	7.25	6.48	5.40	5.24	5.97	6.61	5.59
K_2O	3.47	2.94	0.62	2.35	2.58	0.59	0.23	0.23	1.90	0.58	0.63	0.53	0.94	0.49	3.39
P_2O_5	0.10	0.11	0.12	0.17	0.10	0.11	0.09	0.11	0.15	0.12	0.04	0.16	0.16	0.14	0.12
LOI											1.09	0.75	1.51	1.16	1.87
Total	98.52	98.52	98.52	98.52	98.52	98.52	98.52	98.52	98.52	98.52	98.52	100.06	100.25	99.91	100.47
Trace elements ppm															
Ba	372	410	264	247	365	187	56	52	209	92	61	167	114	37	330
Ce	30.06	29.22	31.840	28.60	28.88	31.272	9.15	10.17	20.69	20.98	12.54	19.96	10.11	8.885	30.96
Cr	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	7.100	33.54	6.510	10.62	20.18
Dy	3.959	3.631	4.207	3.840	3.969	3.909	3.445	3.767	4.964	5.403	7.858	3.587	4.557	4.013	4.393
Er	2.489	2.292	2.618	2.435	2.528	2.465	2.117	2.322	3.028	3.258	4.994	2.271	2.796	2.614	2.664
Eu	0.935	0.876	0.963	0.964	0.955	0.944	0.930	0.955	1.329	1.441	1.198	1.151	1.035	0.841	1.020
Ga	4.104	3.710	4.288	3.769	3.991	3.889	3.068	3.350	4.593	5.071	11.150	11.33	13.41	13.03	13.76
Gd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	6.022	3.230	4.028	3.353	4.276
Ge	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	0.939	1.604	1.218	2.071	1.289
Hf	3.762	3.707	4.652	3.359	3.373	3.605	1.398	1.639	2.591	2.512	2.401	3.628	2.435	2.420	5.380
Ho	0.855	0.788	0.905	0.834	0.864	0.843	0.747	0.819	1.079	1.172	1.686	0.751	0.946	0.853	0.912
La	11.79	10.86	13.31	10.80	11.10	13.10	3.203	3.583	8.363	7.772	4.473	9.555	4.169	3.208	12.92
Lu	0.387	0.362	0.411	0.374	0.392	0.388	0.314	0.358	0.430	0.437	0.762	0.414	0.463	0.460	0.425
Nb	2.708	2.743	2.649	2.593	2.718	2.713	0.679	0.779	1.505	1.379	0.661	2.435	0.689	0.663	2.546
Nd	15.78	14.32	17.29	15.18	15.45	16.83	7.759	8.473	14.30	15.67	12.18	11.99	10.50	8.423	17.15
Pr	3.793	3.500	4.198	3.575	3.644	4.074	1.506	1.671	3.019	3.191	2.274	2.687	2.036	1.608	4.119
Rb	68.08	41.42	16.48	46.28	28.74	8.552	3.973	2.718	27.666	8.021	4.978	7.480	9.036	5.243	73.02
Sm	3.742	3.372	4.006	3.621	3.717	3.846	2.447	2.669	3.955	4.365	4.197	3.042	3.360	2.770	4.137

Table 1a: Major and trace element data for New Caledonia Teremba and Central terrane greywackes.

sample	NCAL 2 Central	NCAL 9 Central	NCAL 10 Central	NCAL 11 Central	NCAL 12 Teremba	NCAL 13 Teremba	NCAL 14 Teremba	NCAL 16 Teremba	NCAL 19 Teremba	NCAL 20 Teremba	NCAL 23a Central	NCAL 25 Teremba	NCAL 24 F.Charbon	LaF3 Teremba
Major elements %														
SiO_2	54.36	63.25	50.53	67.11	57.07	52.04	47.94	38.15	56.04	62.56	59.71	46.94	67.41	65.33
TiO_2	1.07	0.77	1.04	0.64	0.97	0.40	0.66	0.93	1.07	0.59	0.78	1.00	0.55	2.39
Al_2O_3	18.09	15.23	17.09	13.30	16.03	7.55	11.64	12.56	15.37	14.62	18.55	14.80	12.93	0.62
Fe_2O_3	10.12	5.41	7.74	7.05	8.39	2.95	8.57	7.65	8.24	2.85	7.22	5.52	5.39	16.13
MnO	0.16	0.08	0.12	0.08	0.11	0.19	0.17	0.35	0.19	0.04	0.03	0.28	0.04	4.71
MgO	3.09	2.16	3.75	1.35	3.32	1.45	2.00	2.62	3.39	1.79	1.82	1.29	1.64	0.11
CaO	2.38	2.07	6.01	1.49	3.13	16.79	10.99	19.12	4.27	2.98	0.52	12.80	1.65	1.55
Na_2O	5.05	2.77	5.00	3.43	5.11	2.60	1.41	3.14	4.65	2.56	1.43	5.09	2.11	3.70
K_2O	0.81	3.31	1.16	1.23	1.17	0.39	2.12	0.70	1.59	1.77	2.53	0.33	4.81	4.33
P_2O_5	0.23	0.22	0.27	0.18	0.24	0.08	0.13	0.42	0.27	0.13	0.21	0.34	0.05	0.12
LOI	4.52	3.35	6.43	3.20	3.36	14.69	13.01	13.97	5.04	9.25	6.27	11.61	3.20	1.55
Total	99.9	98.6	99.1	99.1	98.9	99.1	98.6	99.6	100.1	99.1	99.1	100	99.8	100.5
Trace elements ppm														
Ba	377	530	254	288	215	53	145	159	243	943	399	105	712	303
Ce	41.66	47.42	26.7	43.39	17.39	13.85	12.15	22.62	22.59	34.34	71.76	55.68	38.26	27.85
Cr	19.56	30.01	33.19	28.34	21.23	18.3	18.7	38.43	19.22	5.492	61.72	36.75	76.66	17.17
Dy	6.393	3.96	3.085	4.056	4.568	2.85	2.799	3.486	4.555	4.313	4.823	7.518	2.454	3.868
Er	3.693	2.226	1.709	2.451	2.743	1.71	1.727	2.021	2.737	2.688	2.903	4.502	1.248	2.390
Eu	1.726	1.131	1.242	1.016	1.19	0.679	0.673	1.067	1.381	1.25	1.221	1.865	1.224	1.057
Ga	21.85	20.21	20.58	15.54	17.91	9.671	14.34	17.17	19.1	15.09	25.61	14.8	14.05	17.16
Gd	6.615	4.351	3.43	4.261	4.397	2.871	2.629	3.735	4.558	4.241	5.111	8.671	3.133	3.863
Ge	1.585	1.35	1.402	1.265	1.204	1.506	1.335	1.185	1.578	0.842	1.815	0.727	1.413	1.126
Hf	4.286	4.327	2.429	5.93	2.096	1.447	1.435	2.625	2.726	4.619	4.576	2.409	3.243	4.889
Ho	1.261	0.77	0.597	0.809	0.938	0.586	0.573	0.689	0.922	0.877	0.971	1.525	0.459	0.825
La	17.12	21.21	11.48	18.5	7.017	8.019	6.162	9.574	9.205	13.66	34.68	24.32	17.09	12.14
Lu	0.608	0.375	0.255	0.418	0.431	0.28	0.295	0.321	0.429	0.504	0.47	0.779	0.194	0.405
Nb	4.665	6.859	2.908	6.174	0.961	1.365	1.166	2.058	2.24	4.665	10.15	2.194	3.071	2.105
Nd	24.34	23.01	15.06	21.9	12.23	10.02	8.816	13.8	15.02	18.48	31.82	34.87	20.33	15.99
Pr	5.416	5.718	3.423	5.346	2.493	2.258	1.948	3.089	3.214	4.435	8.407	7.52	5.047	3.663
Rb	21.95	89.68	25.24	38.43	21.85	7.432	42.07	16.05	27.86	32.95	121.5	7.903	98.57	57.53
Sm	6.172	4.848	3.571	4.691	3.576	2.453	2.31	3.589	4.069	4.451	6.282	8.593	4.113	3.810
Sr	129.6	347	675	276.8	278.9	136.1	109.8	326.1	393	1640	71.91	229.4	105.2	268.0
Ta	0.55	0.83	0.32	0.804	0.254	0.238	0.155	0.267	0.221	0.598	0.977	0.283	0.667	0.185
Tb	1.034	0.656	0.51	0.668	0.714	0.454	0.438	0.575	0.728	0.697	0.805	1.277	0.462	0.608
Th	4.02	8.972	2.321	7.805	1.29	1.446	1.249	2.889	1.813	7.161	13.81	1.401	2.594	6.649
Tm	0.551	0.336	0.243	0.377	0.398	0.259	0.261	0.297	0.405	0.428	0.441	0.697	0.188	0.369
Y	35.73	22.15	17.49	22.77	27.59	19.36	17.38	20.3	26.95	24.63	28.13	45.34	11.95	25.74

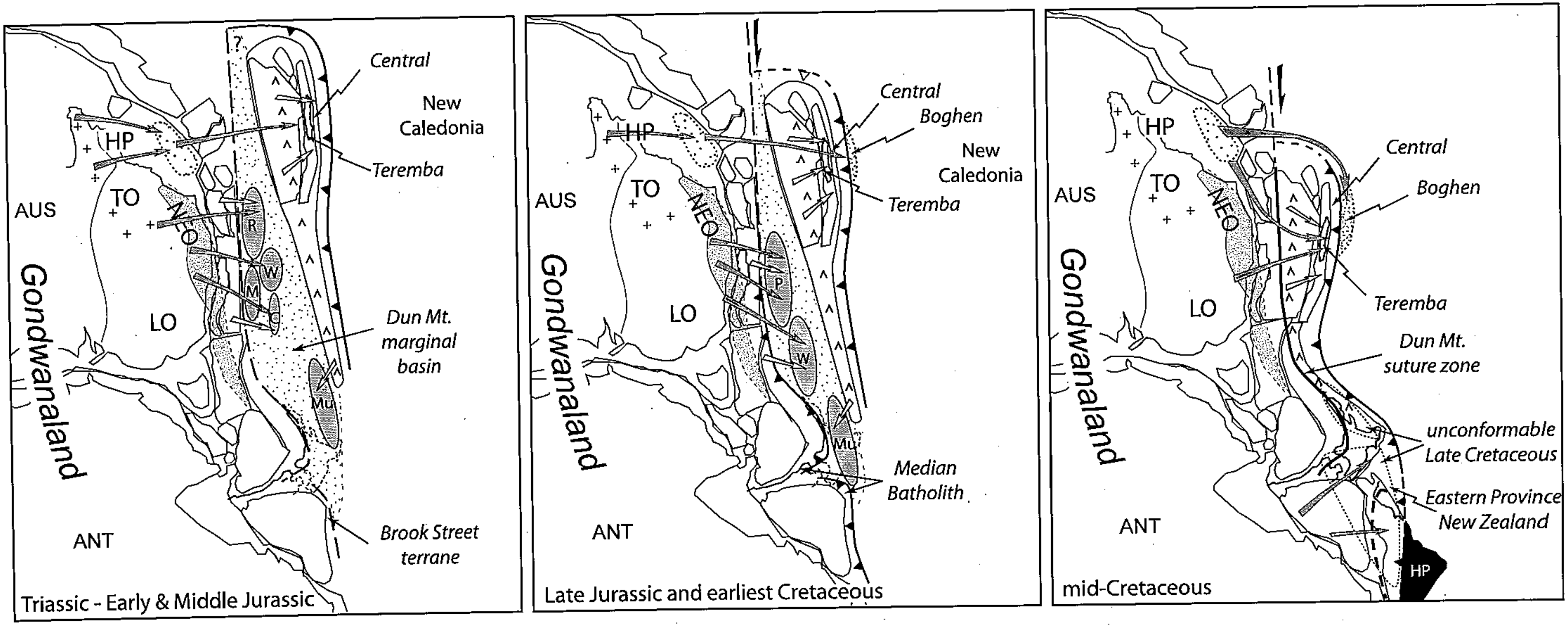

AUS
HP
TO
NEO
LO
Gondwanaland
ANT
R
W
M
C
Mu
?
Central
New Caledonia
Teremba
Dun Mt. marginal basin
Brook Street terrane
Triassic - Early & Middle Jurassic
AUS
HP
TO
NEO
LO
Gondwanaland
ANT
P
W
Mu
Central
Boghen
New Caledonia
Teremba
Median Batholith
Late Jurassic and earliest Cretaceous
AUS
HP
TO
NEO
LO
Gondwanaland
ANT
Central
Boghen
Teremba
Dun Mt. suture zone
unconformable Late Cretaceous
Eastern Province New Zealand
HP
mid-Cretaceous

Fig 6 B

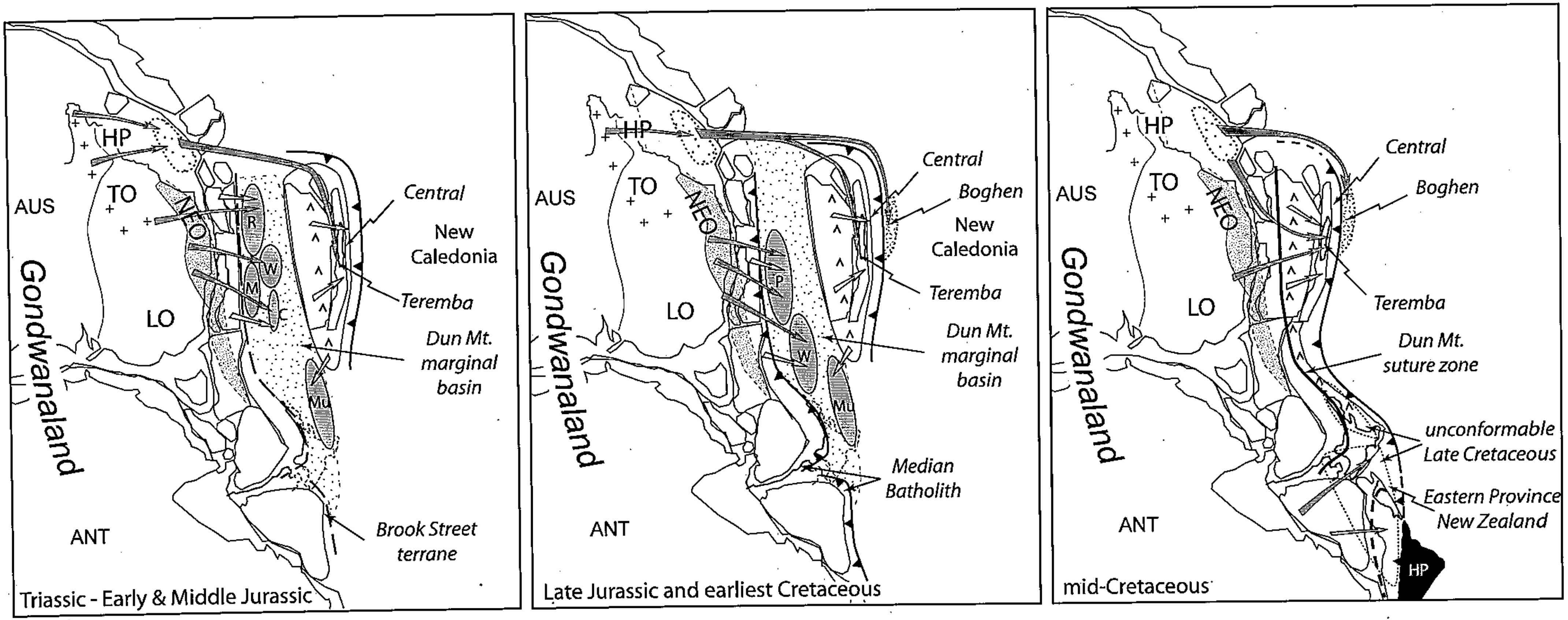

Triassic - Early & Middle Jurassic
AUS
HP
TO
NEO
LO
R
W
M
C
Mu
Gondwanaland
ANT
Central
New Caledonia
Teremba
Dun Mt. marginal basin
Brook Street terrane
Late Jurassic and earliest Cretaceous
AUS
HP
TO
NEO
LO
P
W
Mu
Gondwanaland
ANT
Central
Boghen
New Caledonia
Teremba
Dun Mt. marginal basin
Median Batholith
mid-Cretaceous
AUS
HP
TO
NEO
LO
Gondwanaland
ANT
Central
Boghen
Teremba
Dun Mt. suture zone
unconformable Late Cretaceous
Eastern Province New Zealand
HP

Fig6 A

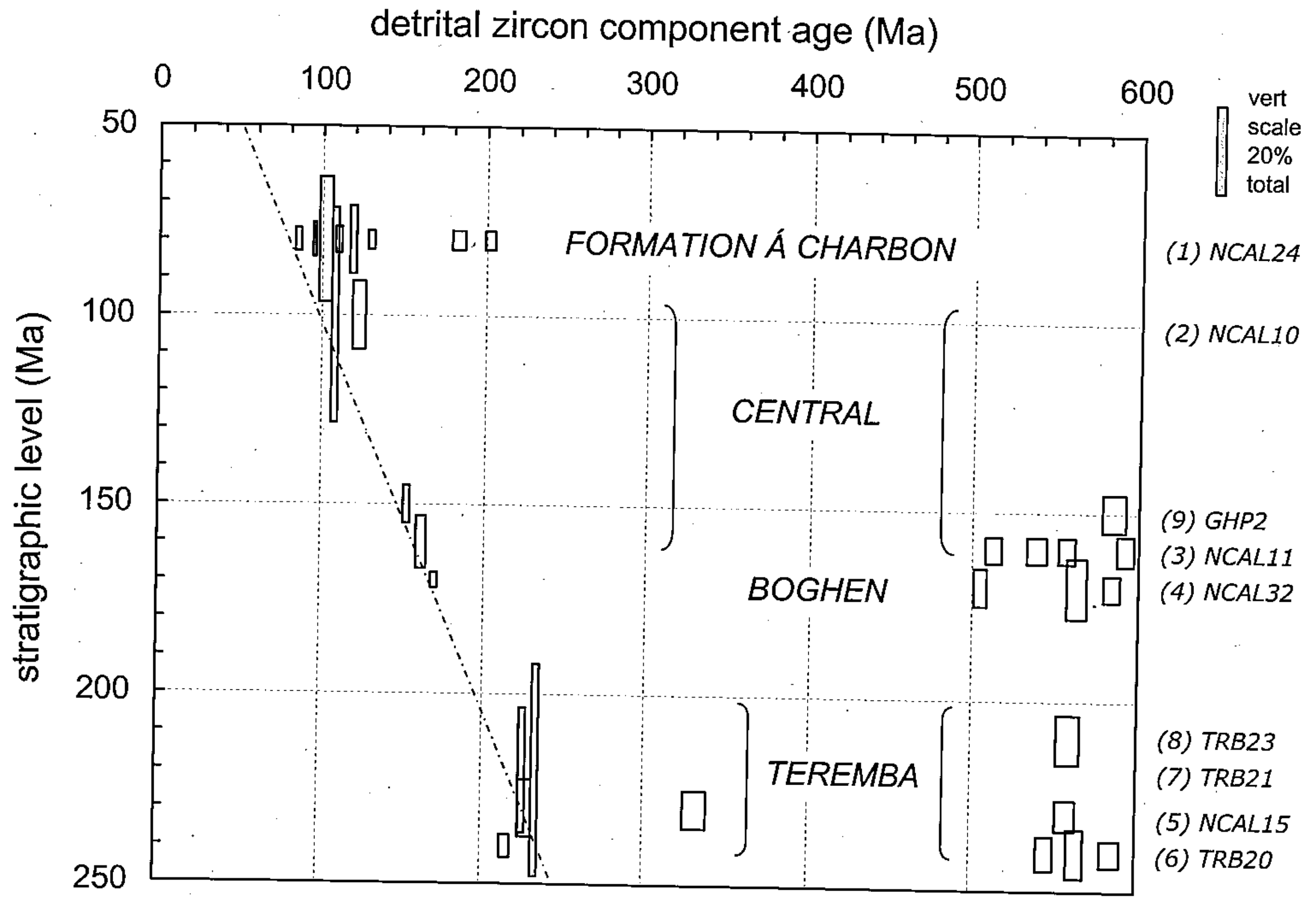
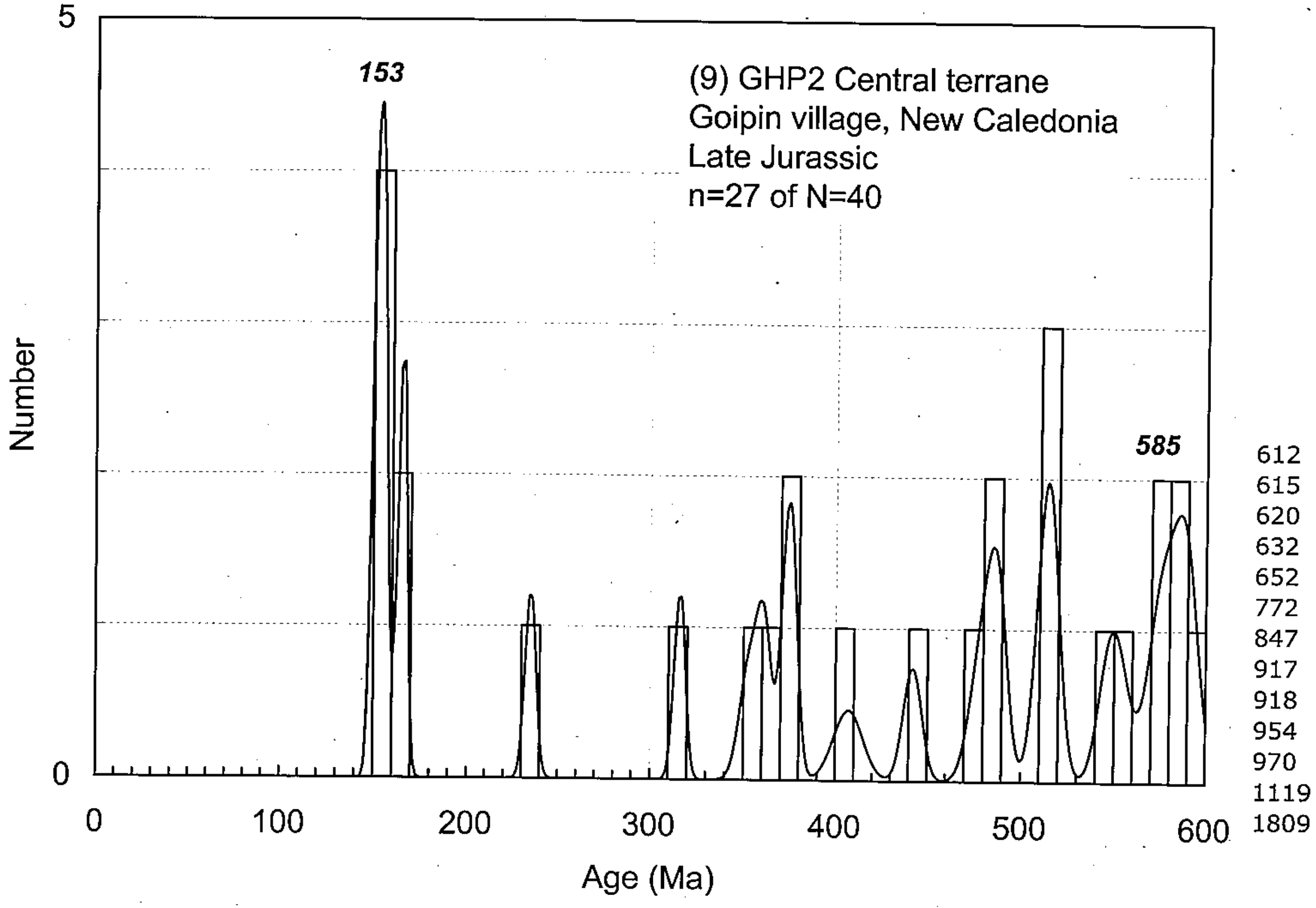
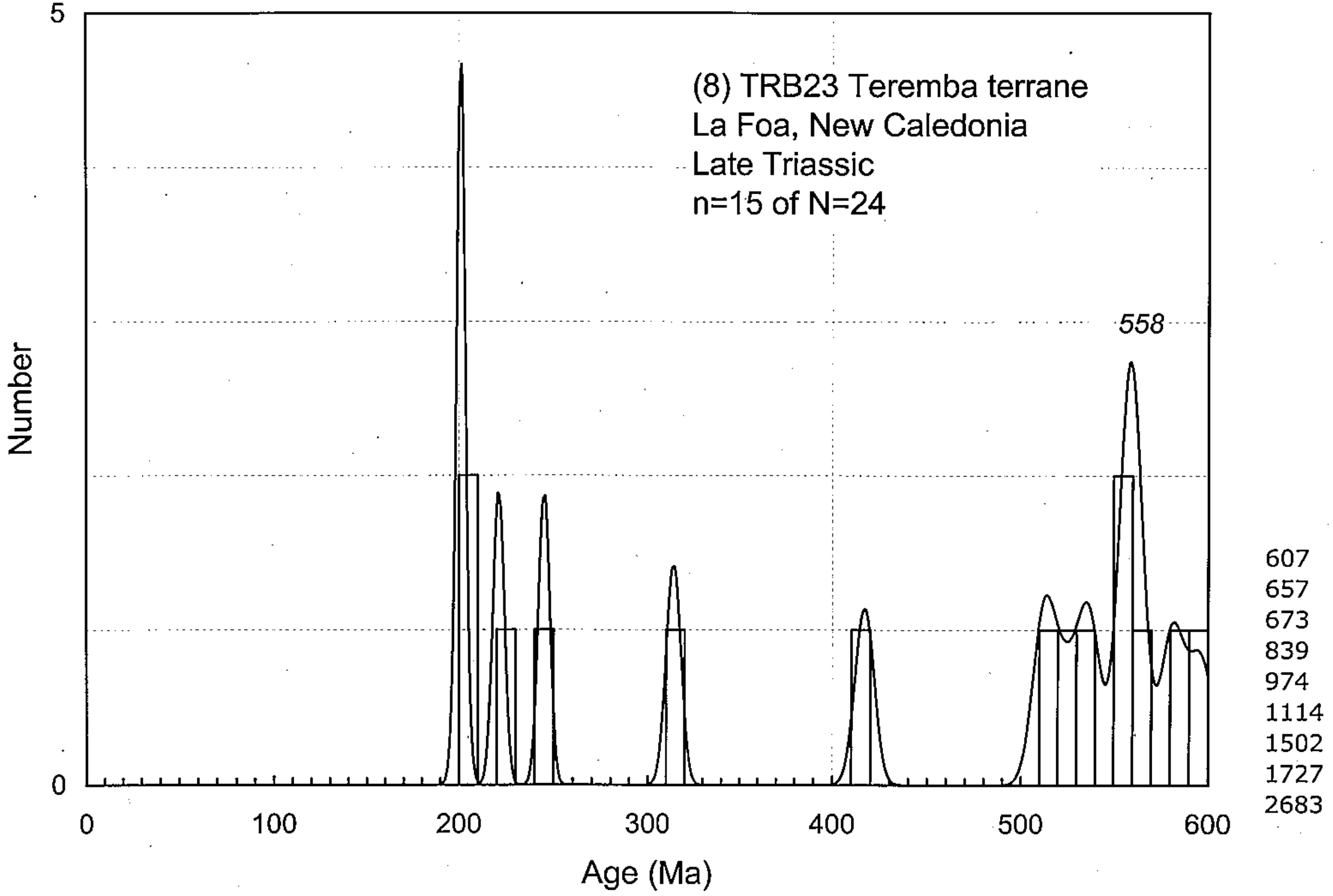
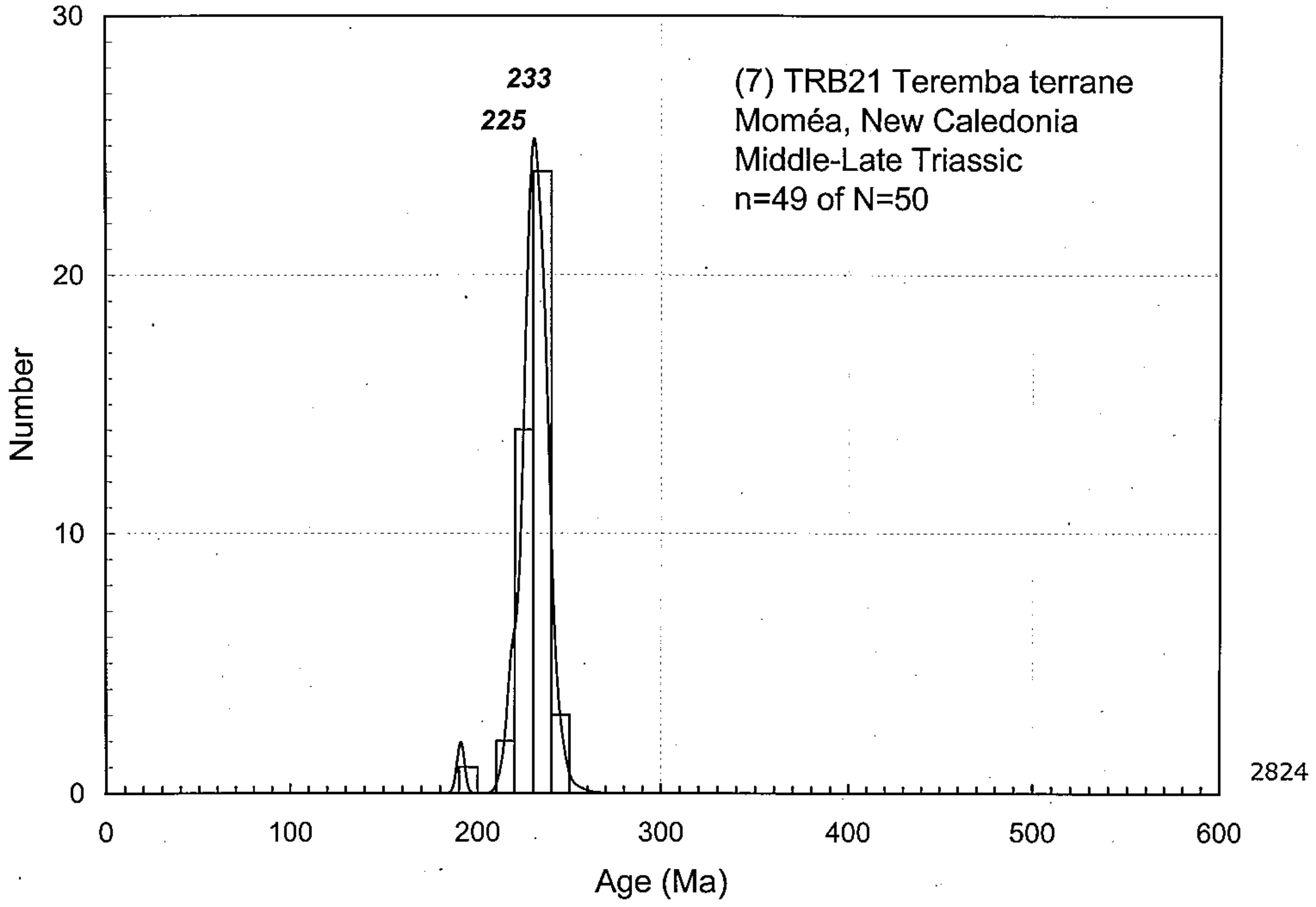
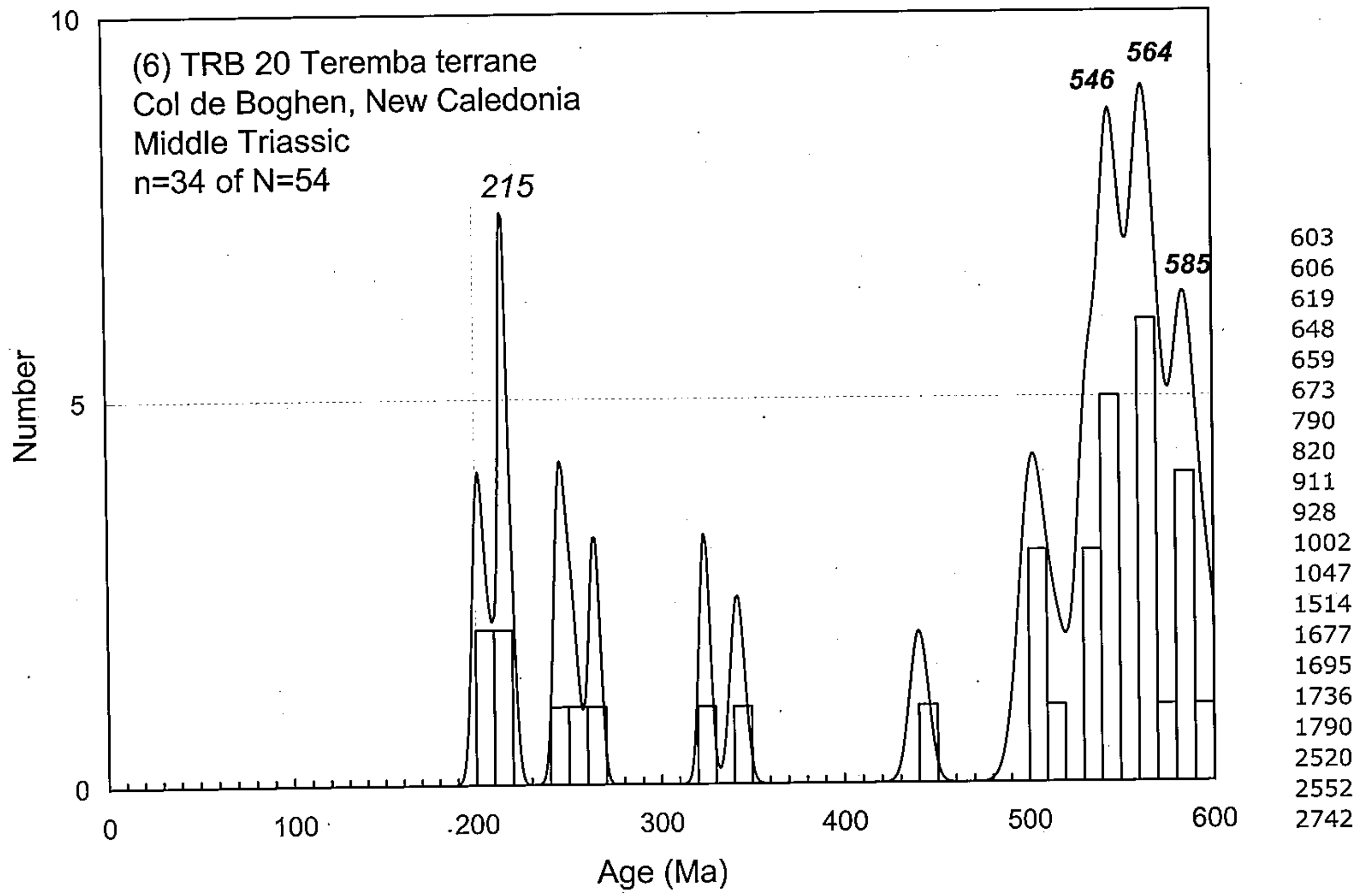

detrital zircon component age (Ma)
0
100
200
300
400
500
600
stratigraphic level (Ma)
50
100
150
200
250
vert scale 20% total
FORMATION Á CHARBON
CENTRAL
BOGHEN
TEREMBA
(1) NCAL24
(2) NCAL10
(9) GHP2
(3) NCAL11
(4) NCAL32
(8) TRB23
(7) TRB21
(5) NCAL15
(6) TRB20

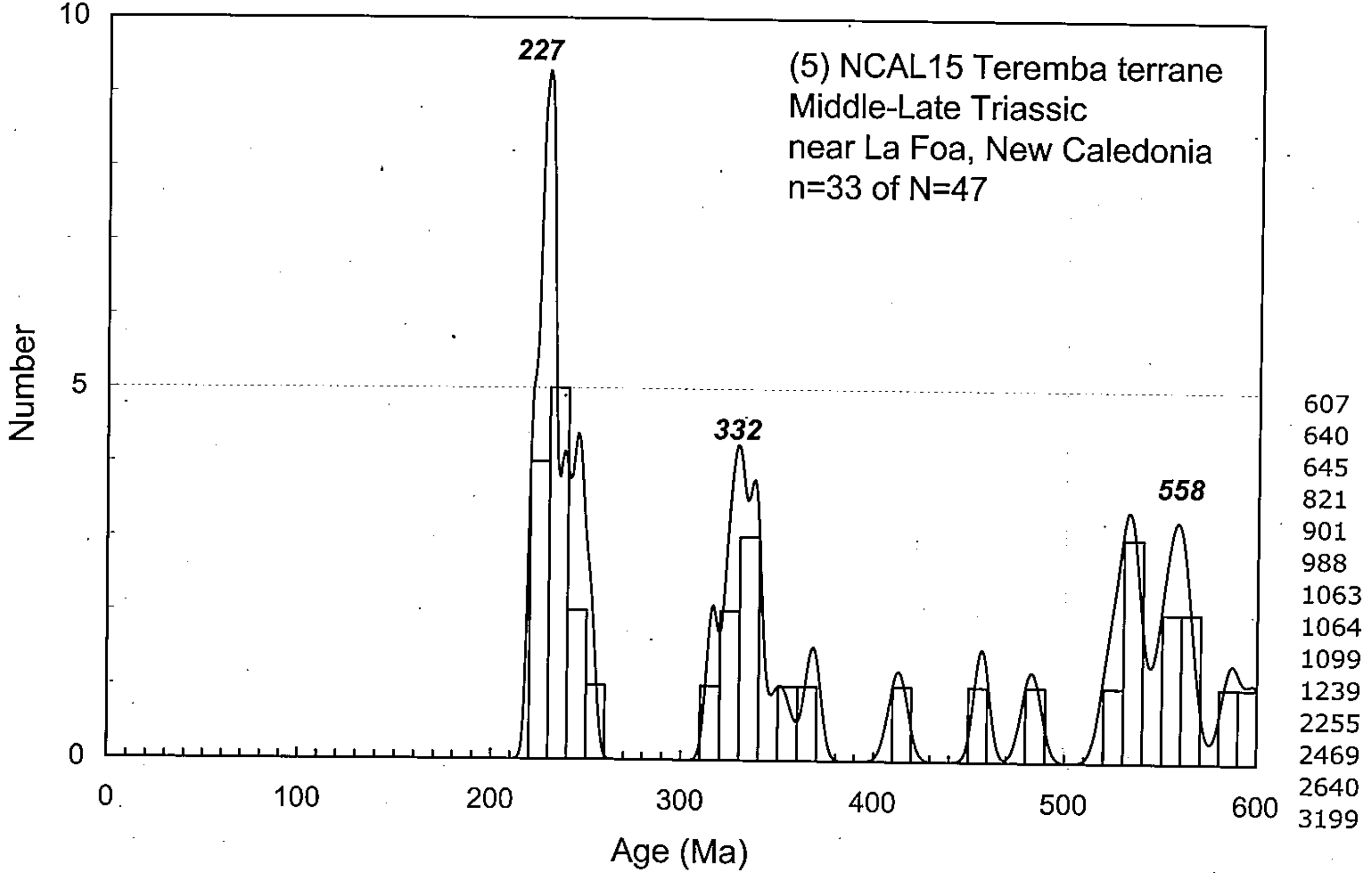
Fig 5


153
(9) GHP2 Central terrane
Goipin village, New Caledonia
Late Jurassic
n=27 of N=40
585
612
615
620
632
652
772
847
917
918
954
970
1119
1809
5
0
Number
0
100
200
300
400
500
600
Age (Ma)


(8) TRB23 Teremba terrane
La Foa, New Caledonia
Late Triassic
n=15 of N=24
558
5
0
Number
0
100
200
300
400
500
600
Age (Ma)
607
657
673
839
974
1114
1502
1727
2683


(7) TRB21 Teremba terrane
Moméa, New Caledonia
Middle-Late Triassic
n=49 of N=50
233
225
2824
Number
30
20
10
0
Age (Ma)
0
100
200
300
400
500
600


(6) TRB 20 Teremba terrane
Col de Boghen, New Caledonia
Middle Triassic
n=34 of N=54
215
546
564
585
10
5
0
Number
0
100
200
300
400
500
600
Age (Ma)
603
606
619
648
659
673
790
820
911
928
1002
1047
1514
1677
1695
1736
1790
2520
2552
2742


(5) NCAL15 Teremba terrane
Middle-Late Triassic
near La Foa, New Caledonia
n=33 of N=47
227
332
558
Number
10
5
0
Age (Ma)
0
100
200
300
400
500
600
607
640
645
821
901
988
1063
1064
1099
1239
2255
2469
2640
3199

b	332 ± 7	10	
c	558 ± 6	8	
(6) TRB20 (R4300), sandstone; old highway RT1 at Col de Boghen, roadside outcrop, Middle Triassic (Anisian); Lat.21°40'45"S Long.165°39'09"E			
a	215 ± 3	6	54
b	546 ± 5	9	
c	564 ± 5	13	
d	585 ± 6	7	
(7) TRB21 (R24301), sandstone, N of Moméa village, roadside outcrop, Middle-Late Triassic (Ladinian-Norian); Lat. 21°40'11"S Long165°38'54"E			
a	225 ± 2	33	45
b	233 ± 2	56	
(8) TRB23 (R24302), sandstone; near La Foa, nr. watertank, Late Triassic (Ladinian-Rhaetian); Lat. 21°43'21"S Long.165°50'17"E			
a	559 ± 7	13	24

NOTES
Italic numbers in brackets are locality numbers of Table. 1
e standard error
o/c outcrop

version160109

TRB20-15	0.10942	0.00124	4.84116	0.05587	0.32092	0.00342	0.09486	0.00173
TRB20-16	0.08360	0.00112	1.49928	0.01935	0.13009	0.00135	0.04772	0.00127
TRB20-17	0.06134	0.00121	0.83380	0.01631	0.09859	0.00124	0.02997	0.00096
TRB20-18	0.06299	0.00096	0.93544	0.01428	0.10772	0.00123	0.03338	0.00073
TRB20-19	0.06092	0.00078	0.82268	0.01071	0.09798	0.00108	0.03042	0.00063
TRB20-20	0.06054	0.00126	0.58925	0.01180	0.07060	0.00082	0.01654	0.00053
TRB20-21	0.16939	0.00220	10.66170	0.13462	0.45651	0.00473	0.13032	0.00354
TRB20-22	0.06075	0.00222	0.67609	0.02359	0.08071	0.00123	0.03067	0.00323
TRB20-23	0.06008	0.00089	0.80694	0.01175	0.09742	0.00107	0.02955	0.00082
TRB20-24	0.10290	0.00125	4.06493	0.05010	0.28652	0.00308	0.08385	0.00194
TRB20-25	0.05761	0.00076	0.69882	0.00898	0.08799	0.00091	0.02741	0.00067
TRB20-26	0.06002	0.00112	0.78265	0.01449	0.09459	0.00115	0.02816	0.00104
TRB20-27	0.05768	0.00144	0.64102	0.01572	0.08061	0.00110	0.02417	0.00103
TRB20-28	0.07419	0.00111	1.81599	0.02724	0.17753	0.00203	0.05408	0.00169
TRB20-29	0.05875	0.00102	0.67538	0.01187	0.08339	0.00104	0.02702	0.00084
TRB20-30	0.05163	0.00090	0.24166	0.00416	0.03395	0.00039	0.01081	0.00023
TRB20-31	0.06015	0.00127	0.78503	0.01594	0.09466	0.00110	0.02928	0.00078
TRB20-32	0.06111	0.00095	0.76413	0.01131	0.09071	0.00094	0.02851	0.00077
TRB20-33	0.05922	0.00073	0.77672	0.00971	0.09513	0.00103	0.02822	0.00064
TRB20-35	0.04970	0.00119	0.23619	0.00544	0.03447	0.00041	0.01061	0.00045
TRB20-36	0.06000	0.00160	0.71908	0.01878	0.08692	0.00123	0.02312	0.00117
TRB20-37	0.05385	0.00393	0.24353	0.01723	0.03280	0.00074	0.01163	0.00089
TRB20-38	0.05123	0.00141	0.27358	0.00724	0.03873	0.00048	0.01201	0.00054
TRB20-39	0.06294	0.00137	0.95531	0.01977	0.11010	0.00127	0.03113	0.00162
TRB20-40	0.18998	0.00361	13.89015	0.25992	0.53031	0.00671	0.12971	0.00602
TRB20-41	0.07002	0.00161	1.46588	0.03291	0.15184	0.00198	0.04382	0.00207
TRB20-42	0.05835	0.00169	0.73716	0.02085	0.09164	0.00134	0.02542	0.00160
TRB20-43	0.05952	0.00129	0.74720	0.01556	0.09106	0.00102	0.02722	0.00069
TRB20-44	0.06000	0.00116	0.71145	0.01261	0.08601	0.00086	0.01769	0.00085
TRB20-45	0.05196	0.00177	0.28407	0.00939	0.03966	0.00060	0.01064	0.00055
TRB20-46	0.06327	0.00363	0.80963	0.04447	0.09282	0.00214	0.01528	0.00126
TRB20-47	0.06677	0.00137	0.55953	0.01138	0.06078	0.00077	0.01408	0.00077
TRB20-48	0.05897	0.00099	0.72202	0.01190	0.08880	0.00100	0.02641	0.00094
TRB20-49	0.07205	0.00107	1.67136	0.02340	0.16825	0.00169	0.04668	0.00150
TRB20-50	0.04983	0.00199	0.21744	0.00837	0.03165	0.00046	0.00999	0.00049
TRB20-51	0.06015	0.00122	0.79403	0.01577	0.09574	0.00117	0.02642	0.00121
TRB20-52	0.10389	0.00224	4.31404	0.08949	0.30114	0.00367	0.08617	0.00479
TRB20-53	0.10623	0.00229	4.35950	0.09049	0.29762	0.00371	0.09269	0.00484
TRB20-54	0.06681	0.00150	1.20039	0.02566	0.13035	0.00154	0.03900	0.00213
TRB20-55	0.05802	0.00240	0.70814	0.02799	0.08855	0.00142	0.03043	0.00213
TRB20-56	0.05687	0.00146	0.63847	0.01593	0.08141	0.00107	0.02393	0.00119
TRB20-57	0.16620	0.00300	10.52023	0.18544	0.45909	0.00534	0.12194	0.00583

TRB20-15	1790	21	1792	10	1794	17	1832	32
TRB20-16	1164	40	890	10	784	8	768	8 **
TRB20-17	651	43	616	9	606	7	597	19
TRB20-18	708	33	670	7	659	7	664	14
TRB20-19	636	28	610	6	603	6	606	12
TRB20-20	623	46	470	8	440	5	332	11
TRB20-21	2552	22	2494	12	2424	21	2476	63
TRB20-22	630	81	524	14	500	7	611	63
TRB20-23	606	33	601	7	599	6	589	16
TRB20-24	1677	23	1647	10	1624	15	1627	36
TRB20-25	515	30	538	5	544	5	547	13
TRB20-26	604	41	587	8	583	7	561	20
TRB20-27	518	56	503	10	500	7	483	20
TRB20-28	1047	31	1051	10	1053	11	1065	32
TRB20-29	558	39	524	7	516	6	539	17
TRB20-30	269	41	220	3	215	2	217	5
TRB20-31	609	47	588	9	583	6	583	15
TRB20-32	643	34	576	7	560	6	568	15
TRB20-33	575	27	584	6	586	6	562	13
TRB20-35	181	57	215	4	218	3	213	9
TRB20-36	604	59	550	11	537	7	462	23
TRB20-37	365	168	221	14	208	5	234	18
TRB20-38	251	65	246	6	245	3	241	11
TRB20-39	706	47	681	10	673	7	620	32
TRB20-40	2742	32	2742	18	2743	28	2465	108
TRB20-41	929	48	916	14	911	11	867	40
TRB20-42	543	65	561	12	565	8	507	32
TRB20-43	586	48	567	9	562	6	543	14
TRB20-44	604	43	546	7	532	5	354	17
TRB20-45	284	80	254	7	251	4	214	11
TRB20-46	717	125	602	25	572	13	307	25
TRB20-47	831	44	451	7	380	5	283	15 **
TRB20-48	566	37	552	7	548	6	527	19
TRB20-49	987	31	998	9	1002	9	922	29
TRB20-50	187	95	200	7	201	3	201	10
TRB20-51	609	45	593	9	589	7	527	24
TRB20-52	1695	41	1696	17	1697	18	1671	89
TRB20-53	1736	40	1705	17	1679	18	1792	90
TRB20-54	832	48	801	12	790	9	773	41
TRB20-55	531	93	544	17	547	8	606	42
TRB20-56	486	58	501	10	505	6	478	23
TRB20-57	2520	31	2482	16	2436	24	2326	105 N=56

TRB20-5	531	6		
TRB20-44	532	5		
TRB20-36	537	7		
TRB20-25	544	5	a	
TRB20-2	546	6	a	546±5
TRB20-10	546	7	a	n=5
TRB20-55	547	8	a	%9
TRB20-48	548	6	a	
TRB20-32	560	6	b	
TRB20-12	561	6	b	
TRB20-43	562	6	b	564±5
TRB20-42	565	8	b	n=7
TRB20-6	567	6	b	%13
TRB20-3	569	6	b	
TRB20-46	572	13	b	
TRB20-26	583	7	c	
TRB20-31	583	6	c	585±6
TRB20-33	586	6	c	n=4
TRB20-51	589	7	c	%7
TRB20-23	599	6	n=34	
TRB20-19	603	6		
TRB20-17	606	7		
TRB20-8	619	6		
TRB20-1	648	8		
TRB20-18	659	7		
TRB20-39	673	7		
TRB20-54	790	9		
TRB20-4	820	10		
TRB20-41	911	11		
TRB20-11	928	11		
TRB20-49	1002	9		
TRB20-28	**1047**	**31**		
TRB20-14	**1514**	**98**		
TRB20-24	**1677**	**23**		
TRB20-52	**1695**	**41**		
TRB20-53	**1736**	**40**		
TRB20-15	**1790**	**21**		
TRB20-57	**2520**	**31**		
TRB20-21	**2552**	**22**		
TRB20-40	**2742**	**32**	N=54	

C	0	0
DS	2	4
CO	9	17
PC	36	67
n=	54	TRB20

MEASURED ISOTOPIC RATIOS

Analysis No.	^{207}Pb/^{206}Pb	±1s	^{207}Pb/^{235}U	±1s	^{206}Pb/^{238}U	±1s	^{208}Pb/^{232}Th	±1s
(7) TRB21 (R24301), sandstone, N of Moméa, roadside outcrop, Middle-Late Triassic (Ladinian-Norian): Lat. 21°40'11"S Long								
TB21-1	0.05163	0.00115	0.26566	0.00580	0.03732	0.00046	0.01163	0.00033
TB21-2	0.19977	0.00268	13.36382	0.16575	0.48524	0.00475	0.13568	0.00400
TB21-3	0.04400	0.00118	0.21341	0.00553	0.03518	0.00042	0.01115	0.00035
TB21-4	0.05613	0.00113	0.23277	0.00451	0.03007	0.00035	0.00842	0.00031
TB21-5	0.05256	0.00082	0.26406	0.00385	0.03644	0.00036	0.01228	0.00030
TB21-6	0.05893	0.00108	0.30538	0.00546	0.03758	0.00043	0.01228	0.00038
TB21-7	0.05197	0.00143	0.25182	0.00675	0.03515	0.00048	0.01130	0.00046
TB21-8	0.08942	0.00657	0.50779	0.03485	0.04118	0.00121	0.01937	0.00198
TB21-9	0.05173	0.00093	0.26247	0.00466	0.03681	0.00043	0.01158	0.00037
TB21-10	0.05191	0.00089	0.24584	0.00411	0.03435	0.00038	0.01067	0.00023
TB21-11	0.05416	0.00123	0.27351	0.00593	0.03663	0.00043	0.01188	0.00036
TB21-12	0.06326	0.00319	0.31215	0.01511	0.03580	0.00070	0.01187	0.00066
TB21-13	0.05095	0.00084	0.26498	0.00433	0.03772	0.00042	0.01259	0.00028
TB21-14	0.05295	0.00126	0.27024	0.00619	0.03702	0.00044	0.01212	0.00039
TB21-15	0.05263	0.00135	0.26497	0.00655	0.03652	0.00046	0.01180	0.00041
TB21-16	0.05138	0.00098	0.26277	0.00485	0.03710	0.00042	0.01200	0.00032
TB21-17	0.05596	0.00127	0.27163	0.00587	0.03521	0.00041	0.01156	0.00038
TB21-18	0.05460	0.00211	0.26895	0.01005	0.03574	0.00058	0.01115	0.00058
TB21-19	0.06205	0.00164	0.31073	0.00799	0.03633	0.00050	0.01272	0.00051
TB21-20	0.05388	0.00123	0.27562	0.00602	0.03710	0.00043	0.01198	0.00040
TB21-21	0.05103	0.00080	0.25282	0.00388	0.03594	0.00039	0.01164	0.00030
TB21-22	0.05203	0.00095	0.26997	0.00482	0.03763	0.00043	0.01256	0.00039
TB21-23	0.05270	0.00111	0.26555	0.00550	0.03655	0.00045	0.01199	0.00043
TB21-24	0.05146	0.00145	0.25819	0.00713	0.03640	0.00051	0.01132	0.00043
TB21-25	0.05340	0.00095	0.27420	0.00481	0.03724	0.00043	0.01255	0.00029
TB21-26	0.05164	0.00108	0.26548	0.00541	0.03729	0.00044	0.01252	0.00034
TB21-27	0.05068	0.00106	0.26651	0.00543	0.03814	0.00045	0.01255	0.00035
TB21-28	0.05090	0.00092	0.26535	0.00471	0.03781	0.00043	0.01263	0.00031
TB21-29	0.05260	0.00171	0.26760	0.00845	0.03691	0.00054	0.01159	0.00047
TB21-30	0.05422	0.00112	0.27111	0.00532	0.03627	0.00040	0.01233	0.00036
TB21-31	0.05034	0.00138	0.25823	0.00687	0.03721	0.00049	0.01217	0.00047
TB21-32	0.05086	0.00107	0.25750	0.00523	0.03672	0.00042	0.01248	0.00037
TB21-33	0.05807	0.00158	0.28742	0.00757	0.03591	0.00049	0.01128	0.00049
TB21-34	0.05075	0.00145	0.25150	0.00694	0.03595	0.00048	0.01222	0.00043
TB21-35	0.05484	0.00151	0.27136	0.00724	0.03590	0.00049	0.01211	0.00048
TB21-36	0.05304	0.00123	0.26336	0.00597	0.03602	0.00046	0.01132	0.00040
TB21-37	0.05132	0.00127	0.27422	0.00651	0.03876	0.00048	0.01258	0.00049
TB21-38	0.05157	0.00106	0.25856	0.00525	0.03637	0.00044	0.01117	0.00029
TB21-39	0.05143	0.00105	0.24646	0.00499	0.03476	0.00043	0.00988	0.00026
TB21-40	0.05243	0.00112	0.26021	0.00545	0.03600	0.00044	0.01095	0.00030
TB21-41	0.05294	0.00137	0.25417	0.00643	0.03482	0.00046	0.01042	0.00031
TB21-42	0.06794	0.00289	1.24518	0.03951	0.10274	0.00174	0.01801	0.00127
TB21-43	0.05174	0.00080	0.25300	0.00383	0.03547	0.00039	0.01101	0.00023
TB21-44	0.06575	0.00160	0.33179	0.00789	0.03660	0.00050	0.01103	0.00036
TB21-45	0.05072	0.00095	0.24924	0.00450	0.03564	0.00039	0.01141	0.00029
TB21-46	0.05109	0.00081	0.25316	0.00384	0.03594	0.00037	0.01134	0.00024
TB21-47	0.05193	0.00106	0.26415	0.00541	0.03689	0.00045	0.01167	0.00037
TB21-48	0.05275	0.00158	0.26567	0.00775	0.03654	0.00053	0.01078	0.00048
TB21-49	0.05917	0.00157	0.28090	0.00714	0.03444	0.00044	0.01185	0.00043
TB21-50	0.05467	0.00120	0.28247	0.00607	0.03747	0.00047	0.01133	0.00042

CORRECTED AGES (COMMON PB)

Analysis No.	^{207}Pb/^{206}Pb	±1s	^{207}Pb/^{235}U	±1s	^{206}Pb/^{238}U	±1s	^{208}Pb/^{232}Th	±1s
(7) TRB21 (R24301), sandstone, N of Moméa, roadside outcrop, Middle-Late Triassic (Ladinian-Norian): Lat. 21°40'11"S Long165°38'								
TB21-1	269	52	239	5	236	3	234	7
TB21-2	2824	22	2706	12	2550	21	2572	71
TB21-3	-71	57	196	5	223	3	224	7 **
TB21-4	458	46	212	4	191	2	169	6
TB21-5	310	36	238	3	231	2	247	6
TB21-6	565	41	271	4	238	3	247	8 **
TB21-7	284	64	228	5	223	3	227	9
TB21-8		344	224	40	246	8	254	31
TB21-9	273	42	237	4	233	3	233	7
TB21-10	281	40	223	3	218	2	215	5
TB21-11	378	52	245	5	232	3	239	7
TB21-12	717	110	276	12	227	4	239	13 **
TB21-13	239	39	239	3	239	3	253	6
TB21-14	327	55	243	5	234	3	243	8
TB21-15	313	60	239	5	231	3	237	8
TB21-16	258	45	237	4	235	3	241	6
TB21-17	451	52	244	5	223	3	232	8
TB21-18	396	89	242	8	226	4	224	12
TB21-19	209	179	225	16	227	3	227	4
TB21-20	366	53	247	5	235	3	241	8
TB21-21	242	37	229	3	228	2	234	6
TB21-22	287	43	243	4	238	3	252	8
TB21-23	316	49	239	4	231	3	241	9
TB21-24	261	66	233	6	230	3	228	9
TB21-25	346	41	246	4	236	3	252	6
TB21-26	270	49	239	4	236	3	251	7
TB21-27	226	49	240	4	241	3	252	7
TB21-28	236	43	239	4	239	3	254	6
TB21-29	312	76	241	7	234	3	233	9
TB21-30	380	48	244	4	230	2	248	7
TB21-31	211	65	233	6	236	3	244	9
TB21-32	234	50	233	4	232	3	251	7
TB21-33	532	61	257	6	227	3	227	10 **
TB21-34	229	68	228	6	228	3	245	9
TB21-35	406	63	244	6	227	3	243	10
TB21-36	331	54	237	5	228	3	228	8
TB21-37	255	58	246	5	245	3	253	10
TB21-38	266	48	234	4	230	3	225	6
TB21-39	260	48	224	4	220	3	199	5
TB21-40	304	50	235	4	228	3	220	6
TB21-41	326	60	230	5	221	3	210	6
TB21-42	1381	65	821	18	630	10	361	25 **
TB21-43	274	36	229	3	225	2	221	5
TB21-44	798	52	291	6	232	3	222	7
TB21-45	228	44	226	4	226	2	229	6
TB21-46	245	37	229	3	228	2	228	5
TB21-47	282	49	238	4	234	3	235	7
TB21-48	318	70	239	6	231	3	217	10
TB21-49	123	165	208	13	215	3	216	5
TB21-50	399	50	253	5	237	3	228	8 N=50

ACCEPTED SET (in ascending age order)

Analysis No.	Age*	±1s	Groups	Age±2s
(7) TRB21 (R24301), sandstone, N of Moméa, roadside outcrop, Middle-Late Triassic (Ladinian-Norian): Lat. 21°40'11"S Long165°38'54"E				
TB21-4	191	2		
TB21-49	215	3		
TB21-10	218	2	aa	
TB21-39	220	3	aa	
TB21-41	221	3	aa	
TB21-7	223	3	aa	
TB21-17	223	3	aa	
TB21-43	225	2	aa	225±2
TB21-18	226	4	aa	n=15
TB21-45	226	2	aa	%33
TB21-19	227	3	aa	
TB21-35	227	3	aa	
TB21-21	228	2	aa	
TB21-34	228	3	aa	
TB21-36	228	3	aa	
TB21-40	228	3	aa	
TB21-46	228	2	aa	
TB21-24	230	3	a	
TB21-30	230	2	a	
TB21-38	230	3	a	
TB21-5	231	2	a	
TB21-15	231	3	a	
TB21-23	231	3	a	
TB21-48	231	3	a	
TB21-11	232	3	a	
TB21-32	232	3	a	
TB21-44	232	3	a	
TB21-9	233	3	a	233±2
TB21-14	234	3	a	n=25
TB21-29	234	3	a	%56
TB21-47	234	3	a	
TB21-16	235	3	a	
TB21-20	235	3	a	
TB21-1	236	3	a	
TB21-25	236	3	a	
TB21-26	236	3	a	
TB21-31	236	3	a	
TB21-50	237	3	a	
TB21-22	238	3	a	
TB21-13	239	3	a	
TB21-28	239	3	a	
TB21-27	241	3	a	
TB21-37	245	3		
TB21-8	246	8		
TB21-2	**2824**	**22**		N=45

K	0	0
J	1	2
T	43	96
P	0	0
C	0	0
DS	0	0
CO	0	0
PC	1	2
n=	45	TRB21

MEASURED ISOTOPIC RATIOS

Analysis No.	^{207}Pb/^{206}Pb	±1s	^{207}Pb/^{235}U	±1s	^{206}Pb/^{238}U	±1s	^{208}Pb/^{232}Th	±1s
(8) TRB23 (R24302), sandstone: near La Foa, nr. Koindé, Late Triassic (Ladinian-Rhaetian): Lat. 21°43'21"S Long.165°50'17"								
TRB23-1	0.06269	0.00145	0.95099	0.02092	0.11003	0.00132	0.03208	0.00119
TRB23-2	0.05776	0.00150	0.65854	0.01635	0.08270	0.00104	0.02668	0.00111
TRB23-3	0.05833	0.00138	0.73320	0.01657	0.09117	0.00110	0.02973	0.00123
TRB23-4	0.05981	0.00131	0.71630	0.01492	0.08686	0.00102	0.02395	0.00091
TRB23-5	0.06352	0.00194	0.74159	0.02205	0.08474	0.00133	0.01268	0.00070
TRB23-6	0.07119	0.00144	1.05346	0.02032	0.10733	0.00124	0.02571	0.00103
TRB23-7	0.04914	0.00177	0.21429	0.00738	0.03163	0.00045	0.01016	0.00046
TRB23-8	0.10574	0.00177	3.56502	0.05555	0.24454	0.00252	0.04531	0.00171
TRB23-9	0.07383	0.00136	1.66012	0.02917	0.16311	0.00182	0.05516	0.00237
TRB23-10	0.05597	0.00152	0.38490	0.01000	0.04989	0.00064	0.01828	0.00087
TRB23-11	0.06208	0.00162	0.77244	0.01922	0.09027	0.00116	0.03001	0.00148
TRB23-12	0.07231	0.00136	0.67560	0.01234	0.06778	0.00078	0.04243	0.00202
TRB23-13	0.18327	0.00351	10.32219	0.18911	0.40863	0.00476	0.11779	0.00575
TRB23-14	0.07248	0.00320	0.38935	0.01627	0.03898	0.00070	0.00871	0.00055
TRB23-15	0.05942	0.00330	0.80793	0.04303	0.09867	0.00200	0.04268	0.00813

CORRECTED AGES (COMMON PB)

Analysis No.	^{207}Pb/^{206}Pb	±1s	^{207}Pb/^{235}U	±1s	^{206}Pb/^{238}U	±1s	^{208}Pb/^{232}Th	±1s
(8) TRB23 (R24302), sandstone: near La Foa, nr. Koindé, Late Triassic (Ladinian-Rhaetian): Lat. 21°43'21"S Long.165°50'17"E								
TRB23-1	698	50	679	11	673	8	638	23
TRB23-2	521	58	514	10	512	6	532	22
TRB23-3	542	53	558	10	562	6	592	24
TRB23-4	597	49	548	9	537	6	478	18
TRB23-5	726	66	563	13	524	8	259	14
TRB23-6	963	42	731	10	657	7	513	20
TRB23-7	155	85	197	6	201	3	204	9
TRB23-8	1727	31	1542	12	1410	13	896	33
TRB23-9	1037	38	993	11	974	10	1085	45
TRB23-10	451	62	331	7	314	4	366	17
TRB23-11	677	57	581	11	557	7	598	29
TRB23-12	621	68	449	10	417	5	412	7
TRB23-13	2683	32	2464	17	2209	22	2251	104
TRB23-14	999	92	334	12	247	4	175	11 **
TRB23-15	583	124	601	24	607	12	845	158

ACCEPTED SET (in ascending age order)

Analysis No.	Age*	±1s	Groups	Age±2s
(8) TRB23 (R24302), sandstone: near La Foa, nr. Koindé, Late Triassic (Ladinian-Rhaetian): Lat. 21°43'21"S Long.165°50'17"E				
TRB23-7	201	3		
TRB23-18	201	2		
TRB23-22	221	3		
TRB23-24	245	3		
TRB23-10	314	4		
TRB23-12	417	5		
TRB23-2	512	6		
TRB23-5	524	8		
TRB23-4	537	6		
TRB23-11	557	7	x	559±7
TRB23-16	558	5	x	n=3
TRB23-3	562	6	x	%13
TRB23-23	581	6		
TRB23-19	596	7	n=15	
TRB23-15	607	12		

K	0	0
J	0	0
T	4	17
P	1	4
C	1	4
DS	1	4
CO	3	13
PC	14	58
n=	24	TRB23

NCA32-31	0.04766	0.00242	0.14494	0.00714	0.02211	0.00036	0.00707	0.00029
NCA32-32	0.05989	0.00117	0.69368	0.01288	0.08422	0.00098	0.02609	0.00081
NCA32-33	0.07489	0.00196	0.85844	0.02114	0.08332	0.00111	0.03040	0.00109
NCA32-34	0.05750	0.00103	0.59737	0.00993	0.07550	0.00084	0.02424	0.00078
NCA32-35	0.14450	0.00217	6.86769	0.09359	0.34532	0.00366	0.09840	0.00309
NCA32-36	0.05711	0.00111	0.52300	0.00931	0.06652	0.00074	0.02061	0.00072
NCA32-37	0.05696	0.00080	0.64615	0.00847	0.08228	0.00080	0.02601	0.00049
NCA32-38	0.05018	0.00117	0.23692	0.00530	0.03424	0.00037	0.01107	0.00025
NCA32-39	0.06254	0.00113	0.77613	0.01322	0.09002	0.00094	0.02722	0.00058
NCA32-40	0.04817	0.00095	0.18279	0.00344	0.02753	0.00028	0.00869	0.00020
NCA32-41	0.06035	0.00083	0.76630	0.00978	0.09209	0.00089	0.02874	0.00060
NCA32-42	0.06110	0.00083	0.68987	0.00869	0.08190	0.00079	0.00891	0.00031
NCA32-43	0.07222	0.00091	1.36194	0.01587	0.13679	0.00131	0.04220	0.00098
NCA32-44	0.05992	0.00092	0.74597	0.01070	0.09029	0.00090	0.02972	0.00105
NCA32-45	0.05991	0.00093	0.72695	0.01052	0.08801	0.00088	0.02850	0.00072
NCA32-46	0.05102	0.00095	0.18385	0.00324	0.02614	0.00027	0.00861	0.00023
NCA32-47	0.06131	0.00087	0.86286	0.01216	0.10208	0.00113	0.03235	0.00097
NCA32-48	0.04868	0.00187	0.17883	0.00660	0.02665	0.00037	0.00859	0.00038
NCA32-49	0.07898	0.00152	2.09631	0.04111	0.19246	0.00264	0.05936	0.00230
NCA32-50	0.05702	0.00095	0.64821	0.01056	0.08245	0.00092	0.02587	0.00060
NCA32-51	0.05989	0.00099	0.78137	0.01313	0.09461	0.00116	0.02831	0.00096
NCA32-52	0.16056	0.00197	10.22396	0.11763	0.46185	0.00449	0.13468	0.00332
NCA32-53	0.07060	0.00089	1.52755	0.01744	0.15693	0.00144	0.04252	0.00097
NCA32-54	0.05957	0.00111	0.78981	0.01510	0.09613	0.00128	0.02970	0.00153
NCA32-55	0.05882	0.00126	0.70458	0.01443	0.08687	0.00099	0.03462	0.00113
NCA32-56	0.05900	0.00095	0.74353	0.01166	0.09141	0.00100	0.03011	0.00076
NCA32-57	0.07489	0.00103	1.93429	0.02685	0.18733	0.00211	0.05842	0.00166
NCA32-58	0.07267	0.00116	1.77554	0.02826	0.17720	0.00208	0.05812	0.00180
NCA32-59	0.11806	0.00209	3.94104	0.07083	0.24208	0.00313	0.07379	0.00311
NCA32-60	0.06321	0.00122	0.94450	0.01837	0.10837	0.00140	0.03378	0.00148
NCA32-61	0.17133	0.00297	7.09613	0.11220	0.30042	0.00317	0.09930	0.00416
NCA32-62	0.05869	0.00099	0.72902	0.01183	0.09011	0.00097	0.02948	0.00071
NCA32-63	0.05897	0.00112	0.74613	0.01429	0.09176	0.00120	0.02900	0.00110
NCA32-64	0.15708	0.00214	9.66324	0.11902	0.44622	0.00419	0.13445	0.00408
NCA32-65	0.05878	0.00076	0.73652	0.00972	0.09089	0.00101	0.02947	0.00077
NCA32-66	0.06170	0.00088	0.87432	0.01261	0.10279	0.00117	0.03354	0.00096
NCA32-67	0.14098	0.00163	6.63114	0.07581	0.34121	0.00354	0.08536	0.00191
NCA32-68	0.04707	0.00120	0.15221	0.00376	0.02346	0.00029	0.00791	0.00026
NCA32-69	0.07835	0.00106	2.12364	0.02716	0.19664	0.00198	0.06335	0.00192
NCA32-70	0.04627	0.00252	0.13678	0.00722	0.02145	0.00035	0.00720	0.00038
NCA32-71	0.06028	0.00115	0.77226	0.01452	0.09294	0.00114	0.03027	0.00133
NCA32-72	0.08051	0.00128	2.21258	0.03538	0.19938	0.00239	0.06029	0.00218

NCA32-31	82	113	137	6	141	2	142	6	
NCA32-32	600	43	535	8	521	6	521	16	
NCA32-33	569	147	518	26	506	7	504	7	
NCA32-34	511	40	476	6	469	5	484	15	
NCA32-35	2282	26	2094	12	1912	18	1897	57	
NCA32-36	496	44	427	6	415	4	412	14	
NCA32-37	490	32	506	5	510	5	519	10	
NCA32-38	203	55	216	4	217	2	223	5	
NCA32-39	693	39	583	8	556	6	543	11	
NCA32-40	108	48	170	3	175	2	175	4	
NCA32-41	616	30	578	6	568	5	573	12	
NCA32-42	643	30	533	5	507	5	179	6	
NCA32-43	992	26	873	7	826	7	835	19	
NCA32-44	601	34	566	6	557	5	592	21	
NCA32-45	600	34	555	6	544	5	568	14	
NCA32-46	242	44	171	3	166	2	173	5	
NCA32-47	650	31	632	7	627	7	644	19	
NCA32-48	132	89	167	6	170	2	173	8	
NCA32-49	1172	39	1148	13	1135	14	1166	44	
NCA32-50	492	38	507	7	511	5	516	12	
NCA32-51	600	37	586	7	583	7	564	19	
NCA32-52	2462	21	2455	11	2448	20	2554	59	
NCA32-53	946	26	942	7	940	8	842	19	
NCA32-54	588	41	591	9	592	8	592	30	
NCA32-55	560	48	542	9	537	6	688	22	
NCA32-56	567	36	564	7	564	6	600	15	
NCA32-57	1066	28	1093	9	1107	11	1148	32	
NCA32-58	1005	33	1037	10	1052	11	1142	34	
NCA32-59	1927	32	1622	15	1398	16	1439	59	**
NCA32-60	715	42	675	10	663	8	671	29	
NCA32-61	2495	42	2073	19	1677	16	1604	19	**
NCA32-62	556	38	556	7	556	6	587	14	
NCA32-63	566	42	566	8	566	7	578	22	
NCA32-64	2424	24	2403	11	2378	19	2550	73	
NCA32-65	559	29	560	6	561	6	587	15	
NCA32-66	664	31	638	7	631	7	667	19	
NCA32-67	2239	20	2063	10	1892	17	1656	36	
NCA32-68	53	57	144	3	149	2	159	5	
NCA32-69	1156	27	1157	9	1157	11	1242	36	
NCA32-70	12	118	130	6	137	2	145	8	
NCA32-71	614	42	581	8	573	7	603	26	
NCA32-72	1210	32	1185	11	1172	13	1183	42	

NCAL32-11	557	7	c	
NCA32-44	557	5	c	
NCA32-65	561	6	c	563±6
NCAL32-4	563	6	c	n=11
NCA32-20	564	6	c	%16
NCA32-56	564	6	c	
NCAL32-9	566	6	c	
NCA32-63	566	7	c	
NCA32-41	568	5	c	
NCAL32-5	573	6		
NCA32-71	573	7		
NCAL32-1	581	6	d	
NCA32-51	583	7	d	584±5
NCA32-18	584	5	d	n=5
NCAL32-2	585	6	d	%7
NCAL32-3	588	6	d	
NCA32-25	592	6		
NCA32-54	592	8		
NCA32-14	594	6	n=49	
NCA32-47	627	7		
NCA32-66	631	7		
NCA32-60	663	8		
NCA32-24	694	7		
NCA32-43	826	7		
NCA32-53	940	8		
NCA32-15	947	9		
NCA32-28	948	10		
NCA32-58	1005	33		
NCA32-57	1066	28		
NCA32-49	1172	39		
NCA32-69	1156	27		
NCA32-72	1210	32		
NCA32-67	2239	20		
NCA32-35	2282	26	n=64	
NCA32-64	2424	24		
NCA32-52	2462	21		
NCAL32-7	2850	18	N=67	

TEREMBA TERRANE

MEASURED ISOTOPIC RATIOS

(5) NCAL15 (R23475). sandstone: highway near La Foa. roadside outcrop. Middle Jurassic (Ladinian) Lat.21°41'31"S. Long.165

Analysis No.	$^{207}Pb/^{206}Pb$	±1s	$^{207}Pb/^{235}U$	±1s	$^{206}Pb/^{238}U$	±1s	$^{208}Pb/^{232}Th$	±1s
NCAL15-1	0.05153	0.00086	0.25762	0.00412	0.03626	0.00036	0.01196	0.00023
NCAL15-2	0.05152	0.00157	0.26637	0.00784	0.03750	0.00043	0.01190	0.00039
NCAL15-3	0.12972	0.00145	3.66300	0.03750	0.20481	0.00191	0.05855	0.00101
NCAL15-4	0.05073	0.00071	0.24958	0.00326	0.03568	0.00035	0.01176	0.00021
NCAL15-5	0.05306	0.00078	0.37685	0.00530	0.05152	0.00052	0.01713	0.00031
NCAL15-6	0.05841	0.00071	0.68090	0.00802	0.08455	0.00085	0.02733	0.00048
NCAL15-7	0.05102	0.00096	0.25164	0.00456	0.03577	0.00039	0.01192	0.00027
NCAL15-8	0.06031	0.00082	0.71468	0.00905	0.08595	0.00083	0.02600	0.00056
NCAL15-9	0.06207	0.00093	0.89995	0.01259	0.10516	0.00103	0.03395	0.00080
NCAL15-10	0.07436	0.00099	1.69763	0.01987	0.16559	0.00144	0.05384	0.00120
NCAL15-11	0.06123	0.00076	0.88058	0.00998	0.10430	0.00097	0.03423	0.00068
NCA15-12	0.05514	0.00073	0.44623	0.00563	0.05870	0.00059	0.01938	0.00042
NCA15-13	0.05366	0.00075	0.38632	0.00518	0.05222	0.00053	0.01699	0.00028
NCA15-14	0.06701	0.00077	1.25542	0.01475	0.13588	0.00145	0.04353	0.00078
NCA15-15	0.05935	0.00076	0.74350	0.00886	0.09086	0.00086	0.02911	0.00045
NCA15-16	0.16125	0.00192	10.44717	0.11810	0.46993	0.00463	0.13397	0.00286
NCA15-17	0.07483	0.00093	1.76360	0.02162	0.17095	0.00180	0.05024	0.00097
NCA15-18	0.07614	0.00122	1.80970	0.02658	0.17238	0.00166	0.05660	0.00148
NCA15-19	0.05126	0.00085	0.24684	0.00389	0.03493	0.00035	0.01169	0.00023
NCA15-20	0.05986	0.00077	0.78598	0.00945	0.09523	0.00092	0.03358	0.00068
NCA15-21	0.18925	0.00256	11.75274	0.16183	0.45044	0.00523	0.13796	0.00354
NCA15-22	0.05154	0.00187	0.25021	0.00879	0.03521	0.00044	0.01324	0.00050
NCA15-23	0.05441	0.00094	0.40216	0.00686	0.05361	0.00062	0.01754	0.00049
NCA15-24	0.05249	0.00112	0.27363	0.00564	0.03781	0.00043	0.01314	0.00036
NCA15-25	0.05279	0.00166	0.26561	0.00805	0.03650	0.00043	0.01229	0.00036
NCA15-26	0.05139	0.00129	0.28270	0.00685	0.03990	0.00047	0.01317	0.00031
NCA15-27	0.05367	0.00068	0.38949	0.00479	0.05264	0.00054	0.01700	0.00032
NCA15-28	0.06034	0.00072	0.81062	0.00927	0.09743	0.00096	0.03152	0.00060
NCA15-29	0.05228	0.00069	0.28088	0.00362	0.03897	0.00041	0.01312	0.00025
NCA15-30	0.05583	0.00206	0.43088	0.01551	0.05600	0.00098	0.01862	0.00125
NCA15-31	0.05930	0.00083	0.60074	0.00784	0.07349	0.00071	0.00642	0.00018
NCA15-32	0.06095	0.00140	0.76274	0.01757	0.09078	0.00130	0.00910	0.00059
NCA15-33	0.05481	0.00105	0.49941	0.00944	0.06609	0.00079	0.02201	0.00061
NCA15-34	0.07539	0.00119	1.55911	0.02327	0.15001	0.00154	0.03467	0.00122
NCA15-35	0.05916	0.00090	0.70477	0.00995	0.08640	0.00084	0.02732	0.00073
NCA15-36	0.08171	0.00176	2.16275	0.04387	0.19199	0.00217	0.02710	0.00144
NCA15-37	0.06042	0.00102	0.72085	0.01268	0.08653	0.00113	0.01682	0.00061
NCA15-38	0.05905	0.00070	0.80385	0.00955	0.09874	0.00103	0.03086	0.00055
NCA15-39	0.05928	0.00097	0.73496	0.01222	0.08993	0.00110	0.02973	0.00090
NCA15-40	0.05269	0.00087	0.36463	0.00582	0.05020	0.00054	0.01604	0.00032
NCA15-41	0.07480	0.00148	1.77935	0.03568	0.17254	0.00237	0.04247	0.00166
NCA15-42	0.05080	0.00077	0.25516	0.00378	0.03643	0.00039	0.01167	0.00023
NCA15-43	0.05373	0.00074	0.39877	0.00534	0.05383	0.00056	0.01757	0.00035
NCA15-44	0.06226	0.00095	0.66737	0.00995	0.07775	0.00084	0.02540	0.00084
NCA15-45	0.05958	0.00076	0.73498	0.00940	0.08949	0.00097	0.02810	0.00066
NCA15-46	0.14227	0.00173	8.03016	0.09616	0.40944	0.00427	0.12685	0.00292
NCA15-47	0.14987	0.00318	4.87382	0.10069	0.23589	0.00296	0.12311	0.00670
NCA15-48	0.05173	0.00083	0.27638	0.00440	0.03876	0.00044	0.01257	0.00034
NCA15-49	0.25224	0.00456	21.99434	0.37069	0.63249	0.00680	0.16176	0.00680

CORRECTED AGES (COMMON PB)

(5) NCAL15 (R23475). sandstone: highway near La Foa. roadside outcrop. Middle Jurassic (Ladinian) Lat.21°41'31"S. Long.165°44'50

Analysis No.	$^{207}Pb/^{206}Pb$	±1s	$^{207}Pb/^{235}U$	±1s	$^{206}Pb/^{238}U$	±1s	$^{208}Pb/^{232}Th$	±1s	
NCAL15-1	265	39	233	3	230	2	240	5	
NCAL15-2	264	72	240	6	237	3	239	8	
NCAL15-3	2094	20	1563	8	1201	10	1150	19	**
NCAL15-4	229	33	226	3	226	2	236	4	
NCAL15-5	331	34	325	4	324	3	343	6	
NCAL15-6	545	27	527	5	523	5	545	9	
NCAL15-7	242	44	228	4	227	2	240	5	
NCAL15-8	615	30	548	5	532	5	519	11	
NCAL15-9	677	33	652	7	645	6	675	16	
NCAL15-10	1051	27	1008	7	988	8	1060	23	
NCAL15-11	647	27	641	5	640	6	680	13	
NCA15-12	418	30	375	4	368	4	388	8	
NCA15-13	357	32	332	4	328	3	341	6	
NCA15-14	838	24	826	7	821	8	861	15	
NCA15-15	580	28	564	5	561	5	580	9	
NCA15-16	2469	21	2475	10	2483	20	2541	51	
NCA15-17	1064	26	1032	8	1017	10	991	19	
NCA15-18	1099	33	1049	10	1025	9	1113	28	
NCA15-19	253	39	224	3	221	2	235	5	
NCA15-20	599	29	589	5	586	5	668	13	
NCA15-21	2640	48	2515	23	2365	26	2330	29	
NCA15-22	265	85	227	7	223	3	266	10	
NCA15-23	388	40	343	5	337	4	351	10	
NCA15-24	307	50	246	4	239	3	264	7	
NCA15-25	320	73	239	6	231	3	247	7	
NCA15-26	258	59	253	5	252	3	264	6	
NCA15-27	357	29	334	4	331	3	341	6	
NCA15-28	616	26	603	5	599	6	627	12	
NCA15-29	298	31	251	3	246	3	263	5	
NCA15-30	446	84	364	11	351	6	373	25	
NCA15-31	578	31	478	5	457	4	129	4	
NCA15-32	637	51	576	10	560	8	183	12	
NCA15-33	404	44	411	6	413	5	440	12	
NCA15-34	1079	32	954	9	901	9	689	24	
NCA15-35	573	34	542	6	534	5	545	14	
NCA15-36	1239	43	1169	14	1132	12	540	28	
NCA15-37	619	37	551	7	535	7	337	12	
NCA15-38	569	26	599	5	607	6	614	11	
NCA15-39	577	36	559	7	555	7	592	18	
NCA15-40	315	38	316	4	316	3	322	6	
NCA15-41	1063	41	1038	13	1026	13	841	32	
NCA15-42	232	36	231	3	231	2	235	5	
NCA15-43	360	32	341	4	338	3	352	7	
NCA15-44	683	33	519	6	483	5	507	17	
NCA15-45	588	28	559	6	553	6	560	13	
NCA15-46	2255	21	2234	11	2212	20	2414	52	
NCA15-47	2275	44	1757	18	1355	15	1289	21	**
NCA15-48	273	38	248	4	245	3	252	7	
NCA15-49	3199	29	3183	16	3159	27	3031	118	N=49

ACCEPTED SET (in ascending age order)

(5) NCAL15 (R23475). sandstone: highway near La Foa. roadside outcrop. Middle Jurassic (Ladinian) Lat.21°41'31"S. Long.165°44'50"E

Analysis No.	Age*	±1s	Groups	Age±2s
NCA15-19	221	2	a	Carnian/Norian boundary is 227 Ma
NCA15-22	223	3	a	
NCAL15-4	226	2	a	227±4
NCAL15-7	227	2	a	n=7
NCAL15-1	230	2	a	%15
NCA15-25	231	3	a	
NCA15-42	231	2	a	
NCAL15-2	237	3		
NCA15-24	239	3		
NCA15-48	245	3		
NCA15-29	246	3		
NCA15-26	252	3		
NCA15-40	316	3		
NCAL15-5	324	3	b	
NCA15-13	328	3	b	332±7
NCA15-27	331	3	b	n=5
NCA15-23	337	4	b	%10
NCA15-43	338	3	b	
NCA15-30	351	6		
NCA15-12	368	4		
NCA15-33	413	5		
NCA15-31	457	4		
NCA15-44	483	5		
NCAL15-6	523	5		
NCAL15-8	532	5		
NCA15-35	534	5		
NCA15-37	535	7		
NCA15-45	553	6	c	
NCA15-39	555	7	c	558±6
NCA15-32	560	8	c	n=4
NCA15-15	561	5	c	%8
NCA15-20	586	5		
NCA15-28	599	6		n=33
NCA15-38	607	6		
NCAL15-11	640	6		
NCAL15-9	645	6		
NCA15-14	821	8		
NCA15-34	901	9		
NCAL15-10	988	8		
NCA15-41	1063	41		
NCA15-17	1064	26		
NCA15-18	1099	33		
NCA15-36	1239	43		
NCA15-46	2255	21		
NCA15-16	2469	21		
NCA15-21	2640	48		
NCA15-49	3199	29		N=47

K	0	0
J	0	0
T	11	23
P	1	2
C	7	15
DS	2	4
CO	6	13
PC	20	43
n=	47	NCAL15

MEASURED ISOTOPIC RATIOS

(6) TRB20 (R4300). sandstone: old highway RT1 at Col de Boohen. roadside outcrop. Middle Triassic (Anisian): Lat.21°40'45"

Analysis No.	$^{207}Pb/^{206}Pb$	±1s	$^{207}Pb/^{235}U$	±1s	$^{206}Pb/^{238}U$	±1s	$^{208}Pb/^{232}Th$	±1s
TRB20-1	0.06122	0.00121	0.89261	0.01756	0.10576	0.00132	0.03010	0.00089
TRB20-2	0.05721	0.00079	0.69775	0.00955	0.08846	0.00096	0.02525	0.00059
TRB20-3	0.05996	0.00107	0.76266	0.01337	0.09225	0.00108	0.02864	0.00060
TRB20-4	0.07135	0.00126	1.33467	0.02397	0.13568	0.00174	0.04258	0.00145
TRB20-5	0.05986	0.00102	0.70919	0.01184	0.08593	0.00098	0.02708	0.00071
TRB20-6	0.05925	0.00097	0.75118	0.01192	0.09196	0.00100	0.02953	0.00072
TRB20-7	0.05511	0.00103	0.39153	0.00691	0.05153	0.00055	0.01712	0.00048
TRB20-8	0.06185	0.00077	0.85947	0.01073	0.10079	0.00108	0.03117	0.00066
TRB20-9	0.05422	0.00081	0.40691	0.00596	0.05443	0.00059	0.01782	0.00041
TRB20-10	0.05929	0.00119	0.72237	0.01448	0.08834	0.00115	0.03802	0.00236
TRB20-11	0.09268	0.00170	2.00831	0.03468	0.15716	0.00179	0.05145	0.00155
TRB20-12	0.06028	0.00118	0.75489	0.01438	0.09084	0.00107	0.02853	0.00076
TRB20-13	0.05269	0.00098	0.30332	0.00546	0.04176	0.00046	0.01352	0.00031
TRB20-14	0.10220	0.00177	3.47328	0.05778	0.24653	0.00281	0.07832	0.00319

CORRECTED AGES (COMMON PB)

(6) TRB20 (R4300). sandstone: old highway RT1 at Col de Boohen. roadside outcrop. Middle Triassic (Anisian): Lat.21°40'45"S Long.

Analysis No.	$^{207}Pb/^{206}Pb$	±1s	$^{207}Pb/^{235}U$	±1s	$^{206}Pb/^{238}U$	±1s	$^{208}Pb/^{232}Th$	±1s
TRB20-1	647	43	648	9	648	8	599	17
TRB20-2	500	31	537	6	546	6	504	12
TRB20-3	602	40	576	8	569	6	571	12
TRB20-4	967	37	861	10	820	10	843	28
TRB20-5	599	38	544	7	531	6	540	14
TRB20-6	576	36	569	7	567	6	588	14
TRB20-7	417	43	335	5	324	3	343	10
TRB20-8	669	27	630	6	619	6	620	13
TRB20-9	380	34	347	4	342	4	357	8
TRB20-10	578	45	552	9	546	7	754	46
TRB20-11	1240	100	1026	31	928	11	913	11
TRB20-12	614	43	571	8	561	6	569	15
TRB20-13	315	43	269	4	264	3	271	6
TRB20-14	1514	98	1450	38	1407	17	1399	17

ACCEPTED SET (in ascending age order)

(6) TRB20 (R4300). sandstone: old highway RT1 at Col de Boohen. roadside outcrop. Middle Triassic (Anisian): Lat.21°40'45"S Long.165°39'09"E

Analysis No.	Age*	±1s	Groups	Age±2s
TRB20-50	201	3		
TRB20-37	208	5	x	215±3
TRB20-30	215	2	x	n=3
TRB20-35	218	3	x	%6
TRB20-38	245	3		
TRB20-45	251	4		
TRB20-13	264	3		
TRB20-7	324	3		
TRB20-9	342	4		
TRB20-20	440	5		
TRB20-22	500	7		
TRB20-27	500	7		
TRB20-56	505	6		
TRB20-29	516	6		

K	0	0
J	0	0
T	5	9
P	2	4

NCA10-19	0.04688	0.00155	0.10878	0.00350	0.01683	0.00020	0.00573	0.00017
NCA10-20	0.04875	0.00140	0.11319	0.00315	0.01684	0.00019	0.00554	0.00014
NCA10-21	0.04921	0.00437	0.11617	0.01012	0.01712	0.00036	0.00571	0.00031
NCA10-22	0.05147	0.00321	0.12137	0.00736	0.01710	0.00033	0.00540	0.00033
NCA10-23	0.05093	0.00124	0.11815	0.00274	0.01683	0.00018	0.00545	0.00015
NCA10-24	0.05483	0.00132	0.30611	0.00727	0.04049	0.00053	0.01303	0.00065
NCA10-25	0.11653	0.00712	0.29557	0.01694	0.01840	0.00046	0.01094	0.00073
NCA10-26	0.04934	0.00177	0.11903	0.00416	0.01750	0.00025	0.00585	0.00022
NCA10-27	0.04885	0.00143	0.11447	0.00323	0.01700	0.00019	0.00526	0.00014
NCA10-28	0.05322	0.00188	0.13822	0.00476	0.01884	0.00028	0.00783	0.00040
NCA10-29	0.04940	0.00120	0.11412	0.00264	0.01676	0.00018	0.00567	0.00017
NCA10-30	0.04948	0.00099	0.12104	0.00234	0.01775	0.00019	0.00632	0.00016
NCA10-31	0.04992	0.00098	0.15942	0.00305	0.02316	0.00026	0.00791	0.00025

MEASURED ISOTOPIC RATIOS

(3) NCAL11 (R23471), greywacke: Goloin River, streambank o/c. Late Jurassic:Lat.21°33'48"S. Long.165°49'57"E

Analysis No.	^{207}Pb/^{206}Pb	±1s	^{207}Pb/^{235}U	±1s	^{206}Pb/^{238}U	±1s	^{208}Pb/^{232}Th	±1s
NCA11-1	0.05842	0.00072	0.68578	0.00786	0.08514	0.00081	0.02683	0.00045
NCA11-2	0.05807	0.00073	0.65929	0.00758	0.08234	0.00077	0.02518	0.00040
NCA11-3	0.06965	0.00098	1.22576	0.01727	0.12763	0.00142	0.03942	0.00105
NCA11-4	0.05787	0.00094	0.62583	0.01025	0.07844	0.00093	0.02017	0.00055
NCA11-5	0.05724	0.00072	0.64543	0.00795	0.08179	0.00085	0.02383	0.00058
NCA11-6	0.06494	0.00079	1.08822	0.01284	0.12153	0.00123	0.03906	0.00081
NCA11-7	0.05178	0.00104	0.21302	0.00422	0.02984	0.00036	0.00957	0.00027
NCA11-8	0.05103	0.00138	0.18041	0.00474	0.02564	0.00032	0.00865	0.00026
NCA11-9	0.17621	0.00385	6.04445	0.13375	0.24876	0.00354	0.05679	0.00340
NCA11-10	0.05875	0.00079	0.73241	0.00947	0.09041	0.00093	0.02899	0.00062
NCA11-11	0.06321	0.00159	0.20958	0.00504	0.02405	0.00029	0.00865	0.00025
NCA11-12	0.05222	0.00097	0.27856	0.00503	0.03869	0.00044	0.01233	0.00037
NCA11-13	0.05440	0.00163	0.18405	0.00538	0.02454	0.00035	0.00796	0.00030
NCA11-14	0.07644	0.00087	2.03850	0.02203	0.19342	0.00190	0.05707	0.00102
NCA11-15	0.06135	0.00082	0.81605	0.01128	0.09649	0.00112	0.03690	0.00105
NCA11-16	0.05003	0.00078	0.16284	0.00252	0.02361	0.00027	0.00790	0.00019
NCA11-17	0.06068	0.00078	0.79279	0.01037	0.09476	0.00104	0.02852	0.00068
NCA11-18	0.06194	0.00119	0.79978	0.01515	0.09365	0.00115	0.03008	0.00092
NCA11-19	0.05365	0.00074	0.42991	0.00562	0.05812	0.00058	0.01827	0.00036
NCA11-20	0.05902	0.00083	0.70648	0.01018	0.08682	0.00100	0.02705	0.00078
NCA11-21	0.05107	0.00125	0.26883	0.00641	0.03818	0.00049	0.01192	0.00040
NCA11-22	0.06114	0.00080	0.90994	0.01135	0.10794	0.00108	0.03384	0.00077
NCA11-23	0.05427	0.00125	0.39918	0.00905	0.05335	0.00070	0.01709	0.00065
NCA11-24	0.05990	0.00084	0.73433	0.01004	0.08891	0.00094	0.02865	0.00084
NCA11-25	0.17392	0.00196	9.61405	0.10808	0.40096	0.00421	0.12315	0.00220
NCA11-26	0.06108	0.00076	0.82707	0.01028	0.09821	0.00105	0.02990	0.00059
NCA11-27	0.05801	0.00079	0.67114	0.00914	0.08392	0.00093	0.02663	0.00059
NCA11-28	0.05802	0.00095	0.69981	0.01098	0.08749	0.00092	0.02996	0.00088
NCA11-29	0.07455	0.00106	1.78417	0.02644	0.17360	0.00208	0.05222	0.00152
NCA11-30	0.06230	0.00088	0.83456	0.01101	0.09717	0.00095	0.03256	0.00095
NCA11-31	0.05840	0.00072	0.73942	0.00871	0.09184	0.00091	0.02763	0.00052
NCA11-32	0.05719	0.00087	0.58596	0.00912	0.07431	0.00089	0.02306	0.00073
NCA11-33	0.06549	0.00087	1.13888	0.01452	0.12613	0.00128	0.03783	0.00092
NCA11-34	0.05571	0.00085	0.57399	0.00869	0.07473	0.00084	0.02503	0.00068
NCA11-35	0.05057	0.00085	0.17942	0.00293	0.02573	0.00027	0.00806	0.00018
NCA11-36	0.12124	0.00159	3.05632	0.03859	0.18286	0.00187	0.04746	0.00131
NCA11-37	0.05766	0.00066	0.72021	0.00764	0.09060	0.00084	0.02757	0.00047
NCA11-38	0.05021	0.00084	0.17176	0.00275	0.02481	0.00026	0.00892	0.00016
NCA11-39	0.05763	0.00092	0.68696	0.01087	0.08647	0.00099	0.02718	0.00073
NCA11-40	0.05090	0.00148	0.17735	0.00502	0.02527	0.00032	0.00772	0.00021
NCA11-41	0.05984	0.00093	0.80248	0.01292	0.09727	0.00120	0.02256	0.00120
NCA11-42	0.05845	0.00120	0.71005	0.01393	0.08811	0.00100	0.02821	0.00077
NCA11-43	0.07188	0.00089	1.69245	0.01954	0.17077	0.00163	0.05068	0.00120
NCA11-44	0.07587	0.00134	1.73837	0.03136	0.16618	0.00216	0.04806	0.00183
NCA11-45	0.04943	0.00146	0.20831	0.00600	0.03057	0.00041	0.00980	0.00033
NCA11-46	0.04986	0.00076	0.17200	0.00257	0.02502	0.00027	0.00803	0.00020
NCA11-47	0.10855	0.00178	0.70927	0.01077	0.04739	0.00049	0.00682	0.00025
NCA11-48	0.06211	0.00128	0.84793	0.01751	0.09903	0.00132	0.02032	0.00096
NCA11-49	0.05874	0.00078	0.77247	0.01033	0.09540	0.00106	0.03042	0.00067
NCA11-50	0.05975	0.00077	0.79119	0.00982	0.09605	0.00098	0.03068	0.00059
NCA11-51	0.07380	0.00143	1.68135	0.03339	0.16528	0.00231	0.04487	0.00220
NCA11-52	0.05019	0.00073	0.18212	0.00266	0.02632	0.00030	0.00898	0.00020
NCA11-53	0.05999	0.00104	0.70795	0.01233	0.08560	0.00106	0.02536	0.00082
NCA11-54	0.04919	0.00094	0.14754	0.00273	0.02176	0.00024	0.00667	0.00015
NCA11-55	0.05829	0.00070	0.73188	0.00885	0.09108	0.00097	0.02745	0.00060
NCA11-56	0.05739	0.00109	0.66174	0.01265	0.08364	0.00108	0.02511	0.00099
NCA11-57	0.05122	0.00089	0.18450	0.00303	0.02613	0.00027	0.00892	0.00023
NCA11-58	0.05339	0.00076	0.38775	0.00558	0.05268	0.00059	0.01678	0.00043
NCA11-59	0.06848	0.00127	1.38080	0.02629	0.14627	0.00196	0.03023	0.00174
NCA11-60	0.07117	0.00101	1.49448	0.02118	0.15232	0.00172	0.04717	0.00139
NCA11-61	0.05909	0.00178	0.65139	0.01918	0.07997	0.00124	0.00893	0.00066
NCA11-62	0.11394	0.00164	5.25972	0.07299	0.33483	0.00364	0.10037	0.00287

BOGHEN TERRANE

MEASURED ISOTOPIC RATIOS

(4) NCAL32 (R24096), greywacke: Komendu River, streambank o/c. Late Jurassic: Lat.21°19'26"S. Long.165°24'40"E

Analysis No.	^{207}Pb/^{206}Pb	±1s	^{207}Pb/^{235}U	±1s	^{206}Pb/^{238}U	±1s	^{208}Pb/^{232}Th	±1s
NCAL32-1	0.05874	0.00077	0.76433	0.00991	0.09438	0.00100	0.02906	0.00051
NCAL32-2	0.05875	0.00096	0.76912	0.01229	0.09496	0.00105	0.02912	0.00060
NCAL32-3	0.05938	0.00067	0.78178	0.00865	0.09550	0.00097	0.03107	0.00057
NCAL32-4	0.05938	0.00116	0.74741	0.01431	0.09129	0.00109	0.02810	0.00060
NCAL32-5	0.05847	0.00114	0.74949	0.01422	0.09297	0.00109	0.02901	0.00064
NCAL32-6	0.05725	0.00072	0.63555	0.00810	0.08052	0.00088	0.02510	0.00056
NCAL32-7	0.20294	0.00221	13.93205	0.14954	0.49794	0.00504	0.13575	0.00257
NCAL32-8	0.05410	0.00155	0.51164	0.01420	0.06860	0.00082	0.01875	0.00056
NCAL32-9	0.05979	0.00096	0.75697	0.01175	0.09182	0.00099	0.02897	0.00067
NCAL32-10	0.05806	0.00132	0.63919	0.01392	0.07985	0.00091	0.02686	0.00084
NCAL32-11	0.05951	0.00142	0.73979	0.01738	0.09018	0.00124	0.02806	0.00131
NCA32-12	0.05714	0.00112	0.66120	0.01231	0.08393	0.00091	0.02585	0.00087
NCA32-13	0.05798	0.00076	0.68339	0.00865	0.08550	0.00088	0.02728	0.00054
NCA32-14	0.06012	0.00081	0.80036	0.01051	0.09656	0.00101	0.03059	0.00060
NCA32-15	0.07172	0.00098	1.56467	0.02029	0.15825	0.00160	0.05029	0.00126
NCA32-16	0.05893	0.00095	0.71192	0.01091	0.08763	0.00092	0.02843	0.00060
NCA32-17	0.15069	0.00170	6.74485	0.07518	0.32466	0.00337	0.09308	0.00171
NCA32-18	0.06004	0.00080	0.78443	0.00969	0.09477	0.00091	0.03070	0.00060
NCA32-19	0.06004	0.00085	0.64607	0.00922	0.07806	0.00088	0.01982	0.00050
NCA32-20	0.05969	0.00090	0.75228	0.01146	0.09142	0.00107	0.02688	0.00083
NCA32-21	0.05714	0.00069	0.64271	0.00773	0.08158	0.00085	0.02747	0.00066
NCA32-22	0.05872	0.00139	0.72194	0.01643	0.08918	0.00110	0.02968	0.00090
NCA32-23	0.82941	0.01140	167.76666	2.38986	1.46716	0.01967	0.18220	0.00459
NCA32-24	0.06339	0.00093	0.99349	0.01447	0.11369	0.00127	0.03540	0.00100
NCA32-25	0.06099	0.00084	0.80867	0.01104	0.09617	0.00106	0.03053	0.00082
NCA32-26	0.05825	0.00148	0.60581	0.01496	0.07556	0.00101	0.02207	0.00075
NCA32-27	0.05615	0.00092	0.45426	0.00733	0.05879	0.00069	0.01351	0.00049
NCA32-28	0.07638	0.00117	1.66399	0.02515	0.15836	0.00183	0.04700	0.00133
NCA32-29	0.05929	0.00085	0.59339	0.00833	0.07276	0.00081	0.02112	0.00059
NCA32-30	0.19407	0.00284	11.09892	0.15604	0.41577	0.00477	0.11809	0.00339

NCA10-19	43	72	105	3	108	1	115	3	
NCA10-20	136	69	109	3	108	1	112	3	
NCA10-21	158	201	112	9	109	2	115	6	
NCA10-22	262	144	116	7	109	2	109	7	
NCA10-23	238	57	113	2	108	1	110	3	
NCA10-24	405	55	271	6	256	3	262	13	
NCA10-25	514	363	129	19	109	3	106	6	
NCA10-26	164	85	114	4	112	2	118	4	
NCA10-27	141	70	110	3	109	1	106	3	
NCA10-28	338	82	131	4	120	2	158	8	
NCA10-29	167	58	110	2	107	1	114	3	
NCA10-30	171	48	116	2	113	1	127	3	
NCA10-31	191	47	150	3	148	2	159	5	N=29

CORRECTED AGES (COMMON PB)

(3) NCAL11 (R23471), greywacke: Goloin River, streambank o/c. Late Jurassic:Lat.21°33'48"S. Long.165°

Analysis No.	^{207}Pb/^{206}Pb	±1s	^{207}Pb/^{235}U	±1s	^{206}Pb/^{238}U	±1s	^{208}Pb/^{232}Th	±1s	
NCA11-1	546	28	530	5	527	5	535	9	
NCA11-2	532	28	514	5	510	5	503	8	
NCA11-3	918	30	812	8	774	8	781	20	
NCA11-4	525	36	493	6	487	6	404	11	
NCA11-5	501	28	506	5	507	5	476	11	
NCA11-6	772	26	748	6	739	7	774	16	
NCA11-7	276	47	196	4	190	2	193	5	
NCA11-8	242	64	168	4	163	2	174	5	
NCA11-9	2618	37	1982	19	1432	18	1116	65	**
NCA11-10	558	30	558	6	558	5	578	12	
NCA11-11	189	135	153	8	151	2	150	2	
NCA11-12	295	43	250	4	245	3	248	7	
NCA11-13	388	69	172	5	156	2	160	6	
NCA11-14	1107	23	1128	7	1140	10	1122	20	
NCA11-15	652	29	606	6	594	7	732	20	
NCA11-16	196	37	153	2	150	2	159	4	
NCA11-17	628	28	593	6	584	6	568	13	
NCA11-18	672	42	597	9	577	7	599	18	
NCA11-19	356	32	363	4	364	4	366	7	
NCA11-20	568	31	543	6	537	6	539	15	
NCA11-21	244	58	242	5	242	3	240	8	
NCA11-22	644	29	657	6	661	6	673	15	
NCA11-23	382	53	341	7	335	4	343	13	
NCA11-24	600	31	559	6	549	6	571	17	
NCA11-25	2487	41	2324	19	2144	22	2104	24	
NCA11-26	642	27	612	6	604	6	595	12	
NCA11-27	530	31	521	6	519	6	531	12	
NCA11-28	531	37	539	7	541	5	597	17	
NCA11-29	1056	29	1040	10	1032	11	1029	29	
NCA11-30	643	39	607	7	597	5	595	6	
NCA11-31	545	28	562	5	566	5	551	10	
NCA11-32	499	34	468	6	462	5	461	14	
NCA11-33	790	29	772	7	766	7	751	18	
NCA11-34	441	35	461	6	465	5	500	13	
NCA11-35	221	40	168	3	164	2	162	4	
NCA11-36	1975	24	1422	10	1083	10	937	25	**
NCA11-37	517	26	551	5	559	5	550	9	
NCA11-38	205	40	161	2	158	2	179	3	
NCA11-39	516	36	531	7	535	6	542	14	
NCA11-40	236	69	166	4	161	2	155	4	
NCA11-41	598	34	598	7	598	7	451	24	
NCA11-42	547	46	545	8	544	6	562	15	
NCA11-43	983	26	1006	7	1016	9	999	23	
NCA11-44	1092	36	1023	12	991	12	949	35	
NCA11-45	168	71	192	5	194	3	197	7	
NCA11-46	188	36	161	2	159	2	162	4	
NCA11-47	1775	31	544	6	298	3	137	5	**
NCA11-48	678	45	624	10	609	8	407	19	
NCA11-49	557	30	581	6	587	6	606	13	
NCA11-50	595	29	592	6	591	6	611	12	
NCA11-51	1036	40	1001	13	986	13	887	43	
NCA11-52	204	35	170	2	167	2	181	4	
NCA11-53	603	38	544	7	529	6	506	16	
NCA11-54	157	46	140	2	139	2	134	3	
NCA11-55	541	27	558	5	562	6	547	12	
NCA11-56	507	43	516	8	518	6	501	20	
NCA11-57	251	41	172	3	166	2	179	5	
NCA11-58	345	33	333	4	331	4	336	9	
NCA11-59	883	39	881	11	880	11	602	34	
NCA11-60	962	30	928	9	914	10	932	27	
NCA11-61	570	67	509	12	496	7	180	17	
NCA11-62	1863	27	1862	12	1862	18	1933	53	N=62

CORRECTED AGES (COMMON PB)

(4) NCAL32 (R24096), greywacke: Komendu River, streambank o/c. Late Jurassic: Lat.21°19'26"S. Long.1

Analysis No.	^{207}Pb/^{206}Pb	±1s	^{207}Pb/^{235}U	±1s	^{206}Pb/^{238}U	±1s	^{208}Pb/^{232}Th	±1s	
NCAL32-1	557	29	577	6	581	6	579	10	
NCAL32-2	558	36	579	7	585	6	580	12	
NCAL32-3	581	25	586	5	588	6	618	11	
NCAL32-4	581	43	567	8	563	6	560	12	
NCAL32-5	547	44	568	8	573	6	578	13	
NCAL32-6	501	28	500	5	499	5	501	11	
NCAL32-7	2850	18	2745	10	2605	22	2573	46	
NCAL32-8	375	66	420	10	428	5	375	11	
NCAL32-9	596	36	572	7	566	6	577	13	
NCAL32-10	532	51	502	9	495	5	536	17	
NCAL32-11	586	53	562	10	557	7	559	26	
NCA32-12	497	44	515	8	520	5	516	17	
NCA32-13	529	29	529	5	529	5	544	11	
NCA32-14	608	30	597	6	594	6	609	12	
NCA32-15	978	28	956	8	947	9	992	24	
NCA32-16	563	36	546	6	542	5	567	12	
NCA32-17	2354	20	2079	10	1812	16	1799	32	**
NCA32-18	605	29	588	6	584	5	611	12	
NCA32-19	605	31	506	6	485	5	397	10	
NCA32-20	592	33	570	7	564	6	536	16	
NCA32-21	497	27	504	5	506	5	548	13	
NCA32-22	557	53	552	10	551	7	591	18	
NCA32-23	4973	20	5207	14	5822	51	3383	78	**
NCA32-24	721	32	700	7	694	7	703	20	
NCA32-25	639	30	602	6	592	6	608	16	
NCA32-26	539	57	481	9	470	6	441	15	
NCA32-27	458	37	380	5	368	4	271	10	
NCA32-28	1105	31	995	10	948	10	928	26	
NCA32-29	578	32	473	5	453	5	422	12	
NCA32-30	2777	25	2531	13	2241	22	2256	61	**

NCA10-17	114	1	a		n=	28 NCAL10
NCAL10-8	117	2				
NCAL10-7	119	1	b			
NCAL10-6	120	2	b	123±4		
NCA10-28	120	2	b	n=5		
NCAL10-4	124	1	b	%18		
NCA10-15	126	1	b			
NCA10-31	148	2				
NCA10-24	256	3		n=25		
NCAL10-12	815	7				
NCAL10-10	1330	25				
NCA10-14	2350	21		N=28		

ACCEPTED SET (in ascending age order)

(3) NCAL11 (R23471), greywacke: Goloin River, streambank o/c. Late Jurassic:Lat.21°33'48"S. Long.165°49'57"E

Analysis No.	*Age**	*±1s*	*Groups*	*Age±2s*
NCA11-54	139	2		
NCA11-16	150	2	aa	
NCA11-11	151	2	aa	
NCA11-13	156	2	a	
NCA11-38	158	2	a	162±3
NCA11-46	159	2	a	n=8
NCA11-40	161	2	a	%14
NCA11-8	163	2	a	
NCA11-35	164	2	a	
NCA11-57	166	2	a	
NCA11-52	167	2	a	
NCA11-7	190	2		
NCA11-45	194	3		
NCA11-21	242	3		
NCA11-12	245	3		
NCA11-58	331	4		
NCA11-23	335	4		
NCA11-19	364	4		
NCA11-32	462	5		
NCA11-34	465	5		
NCA11-4	487	6		
NCA11-61	496	7		
NCA11-5	507	5	b	
NCA11-2	510	5	b	513±5
NCA11-56	518	6	b	n=4
NCA11-27	519	6	b	%7
NCA11-1	527	5		
NCA11-53	529	6		
NCA11-39	535	6	cc	
NCA11-20	537	6	cc	539±6
NCA11-28	541	5	cc	n=4
NCA11-42	544	6	cc	%7
NCA11-24	549	6	c	
NCA11-10	558	5	c	557±5
NCA11-37	559	5	c	n=4
NCA11-55	562	6	c	%7
NCA11-31	566	5		
NCA11-18	577	7		
NCA11-17	584	6	d	
NCA11-49	587	6	d	592±5
NCA11-50	591	6	d	n=5
NCA11-15	594	7	d	%8
NCA11-30	597	5	d	
NCA11-41	598	7	d	n=44
NCA11-26	604	6		
NCA11-48	609	8		
NCA11-22	661	6		
NCA11-6	739	7		
NCA11-33	766	7		
NCA11-3	774	8		
NCA11-59	880	11		
NCA11-60	914	10		
NCA11-43	983	26		
NCA11-51	986	13		
NCA11-44	991	12		
NCA11-29	1056	29		
NCA11-14	1107	23		
NCA11-62	1863	27		
NCA11-25	2487	41	N=59	

K	1	2
J	12	20
T	2	3
P	0	0
C	2	3
DS	1	2
CO	13	22
PC	28	47
n=	59	NCAL11

ACCEPTED SET (in ascending age order)

(4) NCAL32 (R24096), greywacke: Komendu River, streambank o/c. Late Jurassic: Lat.21°19'26"S. Long.165°24'40"E

Analysis No.	*Age**	*±1s*	*Groups*	*Age±2s*
NCA32-70	137	2		
NCA32-31	141	2		
NCA32-68	149	2		
NCA32-46	166	2	a	170±2
NCA32-48	170	2	a	n=3
NCA32-40	175	2	a	%4
NCA32-38	217	2		
NCA32-27	368	4		
NCA32-36	415	4		
NCAL32-8	428	5		
NCA32-29	453	5		
NCA32-34	469	5		
NCA32-26	470	6		
NCA32-19	485	5		
NCAL32-10	495	5	b	
NCAL32-6	499	5	b	
NCA32-21	506	5	b	505±4
NCA32-33	506	7	b	n=7
NCA32-42	507	5	b	%10
NCA32-37	510	5	b	
NCA32-50	511	5	b	
NCA32-12	520	5		
NCA32-32	521	6		
NCA32-13	529	5		
NCA32-55	537	6		
NCA32-16	542	5		
NCA32-45	544	5		
NCA32-22	551	7		
NCA32-39	556	6	c	
NCA32-62	556	6	c	

K	2	3
J	4	6
T	1	1
P	0	0
C	0	0
DS	3	4
CO	17	25
PC	40	60
n=	67	NCAL32

APPENDIX 2: U-PB DETRITAL ZIRCON ISOTOPIC RATIO AND AGE DATA, NEW CALEDONIA BASEMENT TERRANES

FORMATION À CHARBON

MEASURED ISOTOPIC RATIOS

Analysis No.	^{207}Pb/^{206}Pb	±1s	^{207}Pb/^{235}U	±1s	^{206}Pb/^{238}U	±1s	^{208}Pb/^{232}Th	±1s
(1) NCAL24 (R23485). greywacke: highway outcrop above Koh village. Late Cretaceous: Lat.21°33'48"S. Long.165°49'57"E								
NCA24-1	0.04865	0.00269	0.10534	0.00573	0.01571	0.00022	0.00504	0.00016
NCA24-2	0.04861	0.00200	0.12567	0.00507	0.01875	0.00025	0.00638	0.00019
NCA24-3	0.06036	0.00387	0.16335	0.01001	0.01963	0.00041	0.00734	0.00050
NCA24-4	0.04949	0.00185	0.13104	0.00472	0.01921	0.00026	0.00613	0.00022
NCA24-5	0.04698	0.00099	0.10251	0.00210	0.01583	0.00017	0.00524	0.00012
NCA24-6	0.04849	0.00091	0.12761	0.00232	0.01909	0.00020	0.00607	0.00013
NCA24-7	0.05042	0.00215	0.10801	0.00446	0.01554	0.00025	0.00465	0.00022
NCA24-8	0.04800	0.00175	0.10792	0.00385	0.01631	0.00021	0.00530	0.00018
NCA24-9	0.05572	0.00263	0.14261	0.00650	0.01856	0.00032	0.00620	0.00040
NCA24-10	0.05159	0.00176	0.11243	0.00369	0.01581	0.00021	0.00516	0.00019
NCA24-11	0.04831	0.00209	0.09799	0.00415	0.01471	0.00020	0.00479	0.00019
NCA24-12	0.04907	0.00315	0.08485	0.00531	0.01254	0.00025	0.00419	0.00025
NCA24-13	0.04794	0.00110	0.10802	0.00240	0.01634	0.00019	0.00532	0.00013
NCA24-14	0.04797	0.00100	0.10536	0.00215	0.01593	0.00018	0.00523	0.00012
NCA24-15	0.06046	0.00178	0.11841	0.00329	0.01421	0.00018	0.00479	0.00017
NCA24-16	0.04995	0.00091	0.22187	0.00391	0.03222	0.00035	0.01053	0.00021
NCA24-17	0.04829	0.00097	0.12123	0.00237	0.01821	0.00020	0.00580	0.00012
NCA24-18	0.04898	0.00118	0.10486	0.00246	0.01553	0.00018	0.00510	0.00013
NCA24-19	0.04849	0.00257	0.12579	0.00653	0.01882	0.00026	0.00614	0.00025
NCA24-20	0.04842	0.00201	0.10956	0.00445	0.01641	0.00022	0.00554	0.00021
NCA24-21	0.04861	0.00066	0.11428	0.00151	0.01705	0.00018	0.00557	0.00011
NCA24-22	0.04854	0.00077	0.10477	0.00158	0.01566	0.00016	0.00498	0.00011
NCA24-23	0.07664	0.00097	1.90338	0.02252	0.18015	0.00177	0.05353	0.00117
NCA24-24	0.04706	0.00090	0.09939	0.00184	0.01532	0.00017	0.00481	0.00013
NCA24-25	0.04761	0.00244	0.09965	0.00498	0.01518	0.00026	0.00471	0.00022
NCA24-26	0.04866	0.00229	0.11159	0.00513	0.01663	0.00023	0.00550	0.00020
NCA24-27	0.04983	0.00223	0.12363	0.00538	0.01800	0.00025	0.00577	0.00023
NCA24-28	0.05058	0.00093	0.21934	0.00387	0.03146	0.00033	0.01014	0.00022
NCA24-29	0.04846	0.00211	0.12452	0.00531	0.01864	0.00029	0.00594	0.00024
NCA24-30	0.04884	0.00150	0.11090	0.00328	0.01647	0.00020	0.00533	0.00018
NCA24-31	0.05414	0.00095	0.19740	0.00320	0.02644	0.00026	0.00821	0.00026
NCA24-32	0.04955	0.00209	0.11203	0.00458	0.01640	0.00023	0.00531	0.00022
NCA24-33	0.04861	0.00110	0.10694	0.00236	0.01596	0.00018	0.00519	0.00014
NCA24-34	0.05009	0.00179	0.20368	0.00712	0.02950	0.00045	0.01023	0.00045
NCA24-35	0.04826	0.00183	0.11487	0.00425	0.01726	0.00025	0.00576	0.00021
NCA24-36	0.05400	0.01137	0.11186	0.02309	0.01503	0.00067	0.00490	0.00069
NCA24-37	0.04656	0.00239	0.08286	0.00415	0.01291	0.00019	0.00440	0.00016
NCA24-38	0.04867	0.00183	0.12304	0.00449	0.01834	0.00024	0.00607	0.00021
NCA24-39	0.04926	0.00086	0.10592	0.00178	0.01559	0.00017	0.00517	0.00013
NCA24-40	0.04841	0.00471	0.09026	0.00861	0.01352	0.00028	0.00409	0.00027
NCA24-41	0.04882	0.00078	0.13648	0.00208	0.02027	0.00020	0.00628	0.00013
NCA24-42	0.05115	0.00131	0.09242	0.00228	0.01310	0.00015	0.00439	0.00010
NCA24-43	0.04939	0.00186	0.10670	0.00390	0.01567	0.00020	0.00509	0.00019
NCA24-44	0.05208	0.00154	0.12634	0.00364	0.01760	0.00024	0.00587	0.00021
NCA24-45	0.04847	0.00145	0.11294	0.00329	0.01690	0.00020	0.00559	0.00017
NCA24-46	0.04971	0.00175	0.19331	0.00665	0.02821	0.00042	0.00933	0.00045
NCA24-47	0.05313	0.00161	0.23110	0.00686	0.03155	0.00044	0.01092	0.00046
NCA24-48	0.04901	0.00135	0.10792	0.00286	0.01597	0.00018	0.00533	0.00017
NCA24-49	0.04924	0.00136	0.11016	0.00294	0.01622	0.00019	0.00568	0.00016
NCA24-50	0.04939	0.00098	0.10150	0.00188	0.01490	0.00015	0.00514	0.00014
NCA24-51	0.04830	0.00101	0.10611	0.00218	0.01594	0.00019	0.00551	0.00017
NCA24-52	0.04766	0.00099	0.11720	0.00235	0.01783	0.00019	0.00598	0.00016
NCA24-53	0.04928	0.00106	0.09818	0.00204	0.01445	0.00016	0.00484	0.00013
NCA24-54	0.04968	0.00117	0.13995	0.00313	0.02043	0.00021	0.00713	0.00022
NCA24-55	0.04845	0.00210	0.09967	0.00418	0.01492	0.00020	0.00529	0.00023
NCA24-56	0.04824	0.00208	0.10857	0.00459	0.01632	0.00021	0.00550	0.00020
NCA24-57	0.04911	0.00120	0.12831	0.00305	0.01895	0.00022	0.00639	0.00021
NCA24-58	0.05006	0.00251	0.10976	0.00534	0.01590	0.00023	0.00566	0.00028
NCA24-59	0.04765	0.00103	0.10329	0.00214	0.01572	0.00016	0.00535	0.00015
NCA24-60	0.04691	0.00160	0.10353	0.00345	0.01601	0.00022	0.00519	0.00025
NCA24-61	0.05227	0.00084	0.22155	0.00364	0.03074	0.00038	0.01113	0.00037
NCA24-62	0.06040	0.00157	0.80174	0.02059	0.09628	0.00139	0.03490	0.00159
NCA24-63	0.05009	0.00114	0.12449	0.00271	0.01802	0.00020	0.00615	0.00017
NCA24-64	0.05247	0.00260	0.09801	0.00469	0.01355	0.00020	0.00468	0.00020
NCA24-65	0.05101	0.00135	0.11127	0.00286	0.01582	0.00018	0.00576	0.00016
NCA24-66	0.04859	0.00116	0.13819	0.00323	0.02063	0.00023	0.00691	0.00017
NCA24-67	0.04996	0.00105	0.10877	0.00225	0.01579	0.00019	0.00652	0.00020
NCA24-68	0.05041	0.00104	0.20350	0.00416	0.02928	0.00036	0.01005	0.00032
NCA24-69	0.05486	0.00105	0.21746	0.00406	0.02875	0.00033	0.00967	0.00034
NCA24-70	0.04938	0.00111	0.13086	0.00279	0.01922	0.00021	0.00687	0.00026
NCA24-71	0.04780	0.00087	0.11482	0.00203	0.01742	0.00019	0.00601	0.00018
NCA24-72	0.06004	0.00103	0.74472	0.01249	0.08996	0.00104	0.02805	0.00118
NCA24-73	0.04803	0.00094	0.12299	0.00235	0.01857	0.00021	0.00629	0.00014
NCA24-74	0.05013	0.00219	0.09387	0.00398	0.01358	0.00018	0.00453	0.00016
NCA24-75	0.04885	0.00121	0.10301	0.00249	0.01530	0.00019	0.00501	0.00013
NCA24-76	0.05153	0.00299	0.23398	0.01312	0.03294	0.00061	0.01077	0.00055
NCA24-77	0.04947	0.00324	0.12816	0.00818	0.01879	0.00032	0.00677	0.00037
NCA24-78	0.04892	0.00061	0.10933	0.00128	0.01621	0.00016	0.00566	0.00011
NCA24-79	0.04852	0.00124	0.13530	0.00336	0.02023	0.00024	0.00672	0.00019
NCA24-80	0.05039	0.00342	0.12014	0.00793	0.01729	0.00036	0.00628	0.00039
NCA24-81	0.05317	0.00075	0.40737	0.00562	0.05558	0.00059	0.01835	0.00046
NCA24-82	0.04887	0.00111	0.10429	0.00230	0.01548	0.00018	0.00522	0.00016
NCA24-83	0.05174	0.00091	0.10481	0.00172	0.01469	0.00015	0.00488	0.00017
NCA24-84	0.05874	0.00086	0.72602	0.01047	0.08965	0.00099	0.02817	0.00079
NCA24-85	0.04863	0.00094	0.09703	0.00182	0.01447	0.00016	0.00465	0.00012

CORRECTED AGES (COMMON PB)

Analysis No.	^{207}Pb/^{206}Pb	±1s	^{207}Pb/^{235}U	±1s	^{206}Pb/^{238}U	±1s	^{208}Pb/^{232}Th	±1s
(1) NCAL24 (R23485). greywacke: highway outcrop above Koh village. Late Cretaceous: Lat.21°33'48"S. Long.165°49'57"E								
NCA24-1	131	125	102	5	100	1	102	3
NCA24-2	129	94	120	5	120	2	129	4
NCA24-3	140	213	124	11	124	3	123	7
NCA24-4	171	89	125	4	123	2	124	4
NCA24-5	48	47	99	2	101	1	106	2
NCA24-6	123	45	122	2	122	1	122	3
NCA24-7	214	101	104	4	99	2	94	4
NCA24-8	99	83	104	4	104	1	107	4
NCA24-9	441	108	135	6	119	2	125	8
NCA24-10	267	80	108	3	101	1	104	4
NCA24-11	114	98	95	4	94	1	97	4
NCA24-12	151	146	83	5	80	2	85	5
NCA24-13	96	55	104	2	104	1	107	3
NCA24-14	98	50	102	2	102	1	105	2
NCA24-15	144	201	92	8	90	1	89	2
NCA24-16	193	43	203	3	204	2	212	4
NCA24-17	114	48	116	2	116	1	117	2
NCA24-18	147	58	101	2	99	1	103	3
NCA24-19	123	120	120	6	120	2	124	5
NCA24-20	120	95	106	4	105	1	112	4
NCA24-21	129	33	110	1	109	1	112	2
NCA24-22	126	38	101	1	100	1	100	2
NCA24-23	1112	26	1082	8	1068	10	1054	22
NCA24-24	52	44	96	2	98	1	97	3
NCA24-25	80	114	96	5	97	2	95	4
NCA24-26	131	107	107	5	106	1	111	4
NCA24-27	187	105	118	5	115	2	116	5
NCA24-28	222	44	201	3	200	2	204	4
NCA24-29	122	99	119	5	119	2	120	5
NCA24-30	140	73	107	3	105	1	107	4
NCA24-31	377	40	183	3	168	2	165	5
NCA24-32	174	99	108	4	105	1	107	4
NCA24-33	129	54	103	2	102	1	105	3
NCA24-34	199	85	188	6	187	3	206	9
NCA24-35	112	87	110	4	110	2	116	4
NCA24-36	371	410	108	21	96	4	99	14
NCA24-37	27	111	81	4	83	1	89	3
NCA24-38	132	87	118	4	117	2	122	4
NCA24-39	160	42	102	2	100	1	104	3
NCA24-40	119	217	88	8	87	2	82	5
NCA24-41	139	38	130	2	129	1	127	3
NCA24-42	248	60	90	2	83.9	1	89	2
NCA24-43	166	89	103	4	100	1	103	4
NCA24-44	1	150	107	7	112	2	112	3
NCA24-45	122	71	109	3	108	1	113	3
NCA24-46	181	84	179	6	179	3	188	9
NCA24-47	334	70	211	6	200	3	220	9
NCA24-48	148	66	104	3	102	1	107	3
NCA24-49	159	66	106	3	104	1	114	3
NCA24-50	166	47	98	2	95.3	1	104	3
NCA24-51	114	50	102	2	102	1	111	3
NCA24-52	82	50	113	2	114	1	121	3
NCA24-53	161	51	95	2	92	1	98	3
NCA24-54	180	56	133	3	130	1	144	4
NCA24-55	121	99	96	4	95	1	107	5
NCA24-56	111	98	105	4	104	1	111	4
NCA24-57	153	59	123	3	121	1	129	4
NCA24-58	198	116	106	5	102	1	114	6
NCA24-59	82	52	100	2	101	1	108	3
NCA24-60	45	74	100	3	102	1	105	5
NCA24-61	297	38	203	3	195	2	224	7
NCA24-62	618	57	598	12	593	8	693	31
NCA24-63	199	54	119	2	115	1	124	3
NCA24-64	306	116	95	4	87	1	94	4
NCA24-65	241	62	107	3	101	1	116	3
NCA24-66	128	57	131	3	132	1	139	3
NCA24-67	193	50	105	2	101	1	131	4
NCA24-68	214	49	188	4	186	2	202	6
NCA24-69	28	157	170	11	181	2	182	4
NCA24-70	166	54	125	3	123	1	138	5
NCA24-71	89	44	110	2	111	1	121	4
NCA24-72	605	38	565	7	555	6	559	23
NCA24-73	101	47	118	2	119	1	127	3
NCA24-74	201	103	91	4	87	1	91	3
NCA24-75	141	60	100	2	98	1	101	3
NCA24-76	265	135	213	11	209	4	217	11
NCA24-77	170	149	122	7	120	2	136	7
NCA24-78	144	30	105	1	104	1	114	2
NCA24-79	125	61	129	3	129	2	135	4
NCA24-80	213	155	115	7	111	2	127	8
NCA24-81	336	33	347	4	349	4	368	9
NCA24-82	142	55	101	2	99	1	105	3
NCA24-83		136	90	5	93	1	95	3
NCA24-84	557	33	554	6	553	6	562	16
NCA24-85	130	47	94	2	93	1	94	2 N=85

ACCEPTED SET (in ascending age order)

Analysis No.	*Age**	±1s	*Groups*	*Age±2s*
(1) NCAL24 (R23485). greywacke: highway outcrop above Koh village. Late Cretaceous: Lat.21°33'48"S. Long.165°49'57"E				
NCA24-12	80	2		
NCA24-37	83	1	aa	
NCA24-42	84	1	aa	85±2
NCA24-40	87	2	aa	n=5
NCA24-64	87	1	aa	%6
NCA24-74	87	1	aa	
NCA24-15	90	1		
NCA24-53	92	1	a	
NCA24-83	93	1	a	
NCA24-85	93	1	a	
NCA24-11	94	1	a	
NCA24-55	95	1	a	95±1
NCA24-50	95	1	a	n=8
NCA24-36	96	4	a	%9
NCA24-25	97	2	a	
NCA24-24	98	1	a	
NCA24-75	98	1	b	
NCA24-7	99	2	b	
NCA24-18	99	1	b	
NCA24-82	99	1	b	
NCA24-1	100	1	b	
NCA24-22	100	1	b	
NCA24-39	100	1	b	
NCA24-43	100	1	b	
NCA24-5	101	1	b	
NCA24-10	101	1	b	
NCA24-59	101	1	b	
NCA24-65	101	1	b	
NCA24-67	101	1	b	
NCA24-14	102	1	b	
NCA24-33	102	1	b	102±4
NCA24-48	102	1	b	n=28
NCA24-51	102	1	b	%33
NCA24-58	102	1	b	
NCA24-60	102	1	b	
NCA24-8	104	1	b	
NCA24-13	104	1	b	
NCA24-49	104	1	b	
NCA24-56	104	1	b	
NCA24-78	104	1	b	
NCA24-20	105	1	b	
NCA24-30	105	1	b	
NCA24-32	105	1	b	
NCA24-26	106	1	b	
NCA24-45	108	1	c	
NCA24-21	109	1	c	
NCA24-35	110	2	c	110±2
NCA24-71	111	1	c	n=6
NCA24-80	111	2	c	%7
NCA24-44	112	2	c	
NCA24-52	114	1		
NCA24-27	115	2	d	
NCA24-63	115	1	d	
NCA24-17	116	1	d	
NCA24-38	117	2	d	
NCA24-9	119	2	d	
NCA24-29	119	2	d	
NCA24-73	119	1	d	119±2
NCA24-2	120	2	d	n=15
NCA24-19	120	2	d	%18
NCA24-77	120	2	d	
NCA24-57	121	1	d	
NCA24-6	122	1	d	
NCA24-4	123	2	d	
NCA24-70	123	1	d	
NCA24-3	124	3	d	
NCA24-41	129	1	e	
NCA24-79	129	2	e	130±2
NCA24-54	130	1	e	n=4
NCA24-66	132	1	e	%5
NCA24-31	168	2		
NCA24-46	179	3	f	
NCA24-69	181	2	f	183±4
NCA24-68	186	2	f	n=4
NCA24-34	187	3	f	%5
NCA24-61	195	2		
NCA24-28	200	2	g	
NCA24-47	200	3	g	202±3
NCA24-16	204	2	g	n=4
NCA24-76	209	4	g	%5
NCA24-81	349	4		
NCA24-84	553	6		
NCA24-72	555	6		
NCA24-62	593	8		n=84
NCA24-23	1112	26		N=85

K	70	82
J	6	7
T	4	5
P	0	0
C	1	1
DS	0	0
CO	0	0
PC	4	5
n=	85	NCAL24

CENTRAL TERRANE

MEASURED ISOTOPIC RATIOS

Analysis No.	^{207}Pb/^{206}Pb	±1s	^{207}Pb/^{235}U	±1s	^{206}Pb/^{238}U	±1s	^{208}Pb/^{232}Th	±1s
(2) NCAL10 (R23470). greywacke. Pouembout River. streambank outcrop. mapped as Late Jurassic: Lat.21°06'41"S. Long.165								
NCAL10-3	0.04958	0.00106	0.11043	0.00219	0.01616	0.00015	0.00520	0.00012
NCAL10-4	0.05107	0.00119	0.13673	0.00307	0.01942	0.00022	0.00644	0.00017
NCAL10-5	0.05511	0.00280	0.12373	0.00609	0.01629	0.00025	0.00539	0.00025
NCAL10-6	0.05079	0.00189	0.13143	0.00473	0.01877	0.00025	0.00616	0.00020
NCAL10-7	0.04832	0.00139	0.12444	0.00346	0.01868	0.00023	0.00625	0.00019
NCAL10-8	0.05176	0.00209	0.13123	0.00515	0.01839	0.00029	0.00602	0.00031
NCAL10-9	0.05020	0.00106	0.11590	0.00231	0.01675	0.00017	0.00552	0.00014
NCAL10-10	0.08564	0.00109	2.26504	0.02498	0.19182	0.00161	0.05839	0.00146
NCAL10-11	0.05329	0.00150	0.12328	0.00332	0.01678	0.00019	0.00569	0.00019
NCAL10-12	0.06636	0.00087	1.23262	0.01473	0.13473	0.00123	0.04200	0.00105
NCAL10-13	0.05418	0.00275	0.12865	0.00639	0.01722	0.00025	0.00630	0.00026
NCA10-14	0.15036	0.00179	8.99438	0.09928	0.43386	0.00414	0.12629	0.00255
NCA10-15	0.04750	0.00139	0.12954	0.00366	0.01978	0.00023	0.00632	0.00019
NCA10-16	0.04752	0.00094	0.10761	0.00204	0.01642	0.00017	0.00530	0.00012
NCA10-17	0.05015	0.00209	0.12328	0.00499	0.01783	0.00022	0.00596	0.00024
NCA10-18	0.07658	0.00307	0.18109	0.00694	0.01715	0.00028	0.00819	0.00037

CORRECTED AGES (COMMON PB)

Analysis No.	^{207}Pb/^{206}Pb	±1s	^{207}Pb/^{235}U	±1s	^{206}Pb/^{238}U	±1s	^{208}Pb/^{232}Th	±1s
(2) NCAL10 (R23470). greywacke. Pouembout River. streambank outcrop. mapped as Late Jurassic: Lat.21°06'41"S. Long.165°01'25								
NCAL10-3	175	51	106	2	103.3	1	105	2
NCAL10-4	244	55	130	3	124	1	130	3
NCAL10-5	417	117	118	6	104	2	109	5
NCAL10-6	231	88	125	4	120	2	124	4
NCAL10-7	115	68	119	3	119	1	126	4
NCAL10-8	275	95	125	5	117	2	121	6
NCAL10-9	204	50	111	2	107	1	111	3
NCAL10-10	1330	25	1201	8	1131	9	1147	28
NCAL10-11		124	102	5	106	1	107	3
NCAL10-12	818	28	816	7	815	7	832	20
NCAL10-13	379	117	123	6	110	2	127	5
NCA10-14	2350	21	2337	10	2323	19	2404	46
NCA10-15	74	66	124	3	126	1	127	4
NCA10-16	75	47	104	2	105	1	107	2
NCA10-17	202	98	118	5	114	1	120	5
NCA10-18	1110	82	169	6	110	2	165	7 **

ACCEPTED SET (in ascending age order)

Analysis No.	*Age**	±1s	*Groups*	*Age±2s*
(2) NCAL10 (R23470). greywacke. Pouembout River. streambank outcrop. mapped as Late Jurassic: Lat.21°06'41"S. Long.165°01'25"E				
NCAL10-3	103	1	a	
NCAL10-5	104	2	a	
NCA10-16	105	1	a	
NCAL10-11	106	1	a	
NCAL10-9	107	1	a	
NCA10-29	107	1	a	108±2
NCA10-19	108	1	a	n=16
NCA10-20	108	1	a	%57
NCA10-23	108	1	a	
NCA10-21	109	2	a	
NCA10-22	109	2	a	
NCA10-25	109	3	a	
NCA10-27	109	1	a	
NCAL10-13	110	2	a	
NCA10-26	112	2	a	
NCA10-30	113	1	a	

K	23	82
J	1	4
T	0	0
P	1	4
C	0	0
DS	0	0
CO	0	0
PC	3	11

TABLE 6A: DETRITAL ZIRCON AGE DATA FOR NEW CALEDONIA: PERCENTAGE PROPORTIONS IN GEOLOGICAL PERIODS

DATA SOURCE	SAMPLE NAME/NO.	Location	Strat. range (Ma) young	old	Zircon percentages in selected age ranges Cret	Juras	Trias	Per	Carb	Dev-Sil	Ord-Cam	Precam	SAMPLE NAME/NO.	comments
	FORMATION À CHARBON													
10 *(1)*	**NCAL24**		65	145	82	7	5		1			5	**NCAL24**	
	CENTRAL TERRANE													
C	PIAMB1				■	14	14		4	7	11	■	PIAMB1	
C	PIAMB2				■	3						■	PIAMB2	
C	PIAMB3				100								PIAMB3	
10 *(2)*	**NCAL10**		145*	157*	82	4		4				11	**NCAL10**	
10 *(3)*	**NCAL11**		145	157	3	■	3		3	2	■	■	**NCAL11**	
10*(9)*	**GHP2**		145	155		15	3		5	13	15	■	**GHP2**	
	BOGHEN TERRANE													
10 *(4)*	**NCAL32**				3	6	1			4	■	■	**NCAL32**	
C	NCB134						10	10	3		■	■	NCB134	
C	NCB154					4	13		4	4	4	■	NCB154	
C	NCB169						3	3			■	■	NCB169	
C	TWKB1					7					■	■	TWKB1	
C	TWKD1					19	5				14	■	TWKD1	
	TEREMBA TERRANE													
10 *(5)*	**NCAL15**		237*	245*			■	2	15	4	13	■	**NCAL15**	
10 *(6)*	**TRB20**		241*	245*			9	4		4	17	■	**TRB20**	
10 *(7)*	**TRB21**		203	241		2	96					2	**TRB21**	
10 *(8)*	**TRB23**		200	227			17	4	4	4	13	■	**TRB23**	
					Cret	Juras	Trias	Per	Carb	Dev-Sil	Ord-Cam	Precam		

TABLE 6B: DETRITAL ZIRCON AGE DATA FOR EASTERN QUEENSLAND TERRANES: PERCENTAGE PROPORTIONS IN GEOLOGICAL PERIODS

	SHOALWATER - BEENLEIGH COMPOSITE TERRANE *Shoalwater Terrane*												
A	SHW48	Arthur Point							1	10	13	■	SHW48
A	SHW13	Hummock Str							10	12	11	■	SHW13
K	988	Byfield						3	■	5	1	19	988
A	O21/5	Byfield						3	■	19	5	■	O21/5
	Beenleigh Terrane												
K	983	Miami Beach							4	■	■	■	983
A	BYR10	Broken Hd							6	14	■	■	BYR10
K	982	Broken Hd							12	■	■	■	982
	Gympie Terrane												
A	GYM36	Keafton	200	241			15	■	■		3	8	GYM36
A	GYM106	Eldorado Mine	251	260				95	5				GYM106
	Neranwood Fernvale Belt												
K	984	Neranwood							■	6			984
	SOUTH D'AGUILAR BLOCK												
K	985	Mt. Nebo							■	3	2		985
	WANDILLA TERRANE												
A	WAN30	Alligator Ck							81	11	3	5	WAN30
K	986	Gladstone							97	3			986
A	WAN1	Gladstone						1	96	3			WAN1
					Cret	Juras	Trias	Per	Carb	Dev-Sil	Ord-Cam	Precam	

DATA SOURCES
- 10 this work, data highlighted in bild type
- A Adams, unpublished data
- C Cluzel, unpublished data
- K Korsch, unpublished data

Italic numbers in brackets refer to locality numbers of this study (Table 1)

percentage abundance categories

accessory	1-4%	1-4%
minor	5-19%	5-19%
major	■	20-49%
large	■	50-79%
dominant	80-100%	80-100%

TABLE 5A: DETRITAL ZIRCON AGE DATA FOR NEW CALEDONIA: PERCENTAGE PROPORTIONS IN GEOLOGICAL PERIODS

DATA SOURCE	SAMPLE NAME/NO.	Location	Strat. range (Ma) young	old	Cret	Juras	Trias	Per	Carb	Dev-Sil	Ord-Cam	Precam	SAMPLE NAME/NO.	comments
	FORMATION À CHARBON													
10 *(1)*	**NCAL24**		65	145	82	7	5		1			5	**NCAL24**	
	CENTRAL TERRANE													
C	PIAMB1				■	14	14		4	7	11	■	PIAMB1	
C	PIAMB2				■	3						■	PIAMB2	
C	PIAMB3				100								PIAMB3	
10 *(2)*	**NCAL10**		145*	157*	82	4		4				11	**NCAL10**	
10 *(3)*	**NCAL11**		145	157	3	■	3		3	2	■	■	**NCAL11**	
10(9)	**GHP2**		145	155		15	3		5	13	15	■	**GHP2**	
	BOGHEN TERRANE													
10 *(4)*	**NCAL32**				3	6	1			4	■	■	**NCAL32**	
C	NCB134						10	10	3		■	■	NCB134	
C	NCB154					4	13		4	4	4	■	NCB154	
C	NCB169						3	3			■	■	NCB169	
C	TWKB1					7					■	■	TWKB1	
C	TWKD1					19	5				14	■	TWKD1	
	TEREMBA TERRANE													
10 *(5)*	**NCAL15**		227*	245*			■	2	15	4	13	■	**NCAL15**	*mapped as Ladinian, but probably Norian i.e. <227±4 Ma
10 *(6)*	**TRB20**		241*	245*			9	4		4	17	■	**TRB20**	*mapped as Anisian, but probably Norian i.e. <227±4 Ma
10 *(7)*	**TRB21**		203	241		2	96					2	**TRB21**	
10 *(8)*	**TRB23**		200	227			17	4	4	4	13	■	**TRB23**	

TABLE 5B: DETRITAL ZIRCON AGE DATA FOR NEW ZEALAND EASTERN PROVINCE TERRANES AND NORTHLAND ALLOCHTHONS: PERCENTAGE PROPORTIONS IN GEOLOGICAL PERIODS

DATA SOURCE	SAMPLE NAME/NO.	young	old	Cret	Juras	Trias	Per	Carb	Dev-Sil	Ord-Cam	Precam	SAMPLE NAME/NO.
	NORTHLAND-MOUNT CAMEL ALLOCHTHONS											
A	TK13			■		7		16	6	4	3	TK13
A	HOU8			■	2	7			2	2		HOU8
A	KAEO12			■	10	4	3		3	3	1	KAEO12
	WAIOEKA TERRANE											
3	t420	95	108	■	16	5		8	15	2	2	t420
	PAHAU TERRANE											
7	Ethelton	140	150	18	5	■	10	5	7	13	■	Ethelton
5	HUN4			13	4	■	15	5	3	9	■	HUN4
5	CPD5			5	2	■	■	9		7	■	CPD5
9	RUX2	145	160		16	■	■	8	4	12	7	RUX2
	RAKAIA TERRANE											
5	RBW1	205	220			■	19	6	2	16	■	RBW1
2	OTO1	220	230			■	16	9	4	13	■	OTO1
2	HERM2	220	230			■	18	5	5	15	■	HERM2
5	NGO2	220	230		1	■	19	4	1	14	■	NGO2
5	NGO2	220	230			■	10	4	1	■	■	NGO2
5	PUD1	220	230			■	■	7	1	12	■	PUD1
8	Balmacaan	235	242			14	■	9	5	11	■	Balmacaan
9	SEL4	251	260			5	■	7	5	15	13	SEL4
5	PAR2	251	260			3	■	1	6	10	13	PAR2
1	Aviemore					4	■	4		16	■	Aviemore
8	KUROW	251	260			7	■	■	7	13	10	KUROW
9	BMOX35					2	■	■	16	■	16	BMOX35
	Kakahu Terrane											
5	KAK35	251					■	14	7		14	KAK35
	Akatarawa Terrane											
5	TAKA10	251		6			18	19	■	7	■	TAKA10
3	te94	251				4	■	19	■	4	■	te94
	WAIPAPA TERRANE											
3	t44	133	148		9	■	19	4	10	13	6	t44
3	w4	135	152	3	■	■	■	5	9	11		w4
3	w1	148	160		■	■	■	7	3	7	3	w1
9	TWHX1	148	160		■	■	7	2	3	2	4	TWHX1
3	w5	144	160	4	■	4	2	2	2	2	3	w5
9	TPWX1	150	160		■	13	8	2	2	2	3	TPWX1
9	TWX1	150	155		■	■	15	9	9	5	2	TWX1
5	SPE1				■	■	5	1	10	7	4	SPE1
5	BLU8A				■	■	■	3	10	4	4	BLU8A
5	BOIX31					■	2			1		BOIX31
5	ADMX2				1	■	2	1	1		4	ADMX2
9	PKTNX1					■	6		6			PKTNX1
9	STEPH1	220	230			■	5	14	5			STEPH1
	CAPLES TERRANE											
9	QUOX1	220	230		2	■	14		5			QUOX1
9	VON2					■	11					VON2
A	WRLB1					18	■	15	8		3	WRLB1
	DUN MOUNTAIN-MAITAI TE											
9	STPH12	225	235			16	■	■	7	5		STPH12
9	CST10	235	251			■	■					CST10
6	RODG17	251	260			1	■	17	■	6	11	RODG17
6	WDX1	251	260			10	■	17	17		7	WDX1
	MURIHIKU TERRANE											
9	HURW4	145	160	15	■	5	12		3	3		HURW4
9	ROAR2	210	230		4	■	■		4		4	ROAR2
9	PIOX5	210	230			■	15	■				PIOX5
9	MATI4	251	260			■	17		3			MATI4
	BROOK STREET TERRANE											
6	BAR2A	160	180		■	■	5	2	2		2	BAR2A
9	MAIVX1	251	260			4	■	6	3	4		MAIVX1

DATA SOURCES
- 1 Ireland (1992)
- 2 Adams et al. (1998)
- 3 Cawood et al. (1999)
- 4 Cawood et al. (2002)
- 5 Pickard et al. (2000)
- 6 Adams et al. (2002)
- 7 Wandres et al. (2004a)
- 8 Wandres et al. (2004b)
- 9 Adams et al., 2007
- 10 this work, data highlighted in bold type
- A Adams, unpublished data
- C Cluzel, unpublished data

Italic numbers in brackets refer to locality numbers of this study (Table 1)

percentage abundance categories		
accessory	1-4%	1-4%
minor	░ 5-19%	5-19%
major	▓	20-49%
large	■	50-79%
dominant	■	80-100%

190508

TRB23-16	0.06715	0.00100	0.83775	0.01178	0.09049	0.00093	0.02497	0.00072
TRB23-17	0.06722	0.00112	1.28884	0.02041	0.13907	0.00147	0.04399	0.00098
TRB23-18	0.05257	0.00111	0.22947	0.00463	0.03167	0.00036	0.00925	0.00027
TRB23-19	0.06060	0.00099	0.80865	0.01333	0.09679	0.00116	0.03259	0.00112
TRB23-20	0.07674	0.00115	1.89715	0.02912	0.17933	0.00214	0.04908	0.00151
TRB23-21	0.09369	0.00170	2.74553	0.04695	0.21256	0.00231	0.04988	0.00215
TRB23-22	0.05142	0.00123	0.24712	0.00589	0.03486	0.00049	0.00940	0.00045
TRB23-23	0.06007	0.00113	0.78121	0.01422	0.09433	0.00108	0.02951	0.00081
TRB23-24	0.05291	0.00135	0.28208	0.00697	0.03867	0.00048	0.01332	0.00044

TRB23-16	842	32	618	7	558	5	499	14	
TRB23-17	845	35	841	9	839	8	870	19	
TRB23-18	310	49	210	4	201	2	186	5	
TRB23-19	625	36	602	7	596	7	648	22	
TRB23-20	1114	31	1080	10	1063	12	968	29	
TRB23-21	1502	35	1341	13	1242	12	984	41	
TRB23-22	260	56	224	5	221	3	189	9	
TRB23-23	606	42	586	8	581	6	588	16	
TRB23-24	325	59	252	6	245	3	267	9	N=24

TRB23-6	657	7	
TRB23-1	673	8	
TRB23-17	839	8	
TRB23-9	974	10	
TRB23-20	**1114**	**31**	
TRB23-21	**1502**	**35**	
TRB23-8	**1727**	**31**	
TRB23-13	**2683**	**32**	N=24

MEASURED ISOTOPIC RATIOS

Analysis No.	$^{207}Pb/^{206}Pb$	±1s	$^{207}Pb/^{235}U$	±1s	$^{206}Pb/^{238}U$	±1s	$^{208}Pb/^{232}Th$	±1s
(9) GHP2 (R24477), sandstone; Goipin River valley; Late Jurassic; Lat.21°13'23"S Long.161°16'11"E								
GHP-1	0.05884	0.00076	0.67620	0.00878	0.08341	0.00090	0.02674	0.00042
GHP-2	0.06377	0.00093	0.93404	0.01390	0.10637	0.00124	0.03466	0.00105
GHP-3	0.05107	0.00063	0.17250	0.00215	0.02453	0.00026	0.00872	0.00017
GHP-4	0.06167	0.00070	0.87463	0.00990	0.10295	0.00106	0.03323	0.00051
GHP-5	0.05124	0.00134	0.17027	0.00429	0.02411	0.00028	0.00784	0.00015
GHP-6	0.06108	0.00077	0.84130	0.01086	0.10003	0.00111	0.03068	0.00054
GHP-7	0.05744	0.00102	0.65337	0.01119	0.08258	0.00091	0.02745	0.00051
GHP-8	0.05941	0.00067	0.76746	0.00889	0.09377	0.00101	0.03013	0.00047
GHP-9	0.05982	0.00100	0.78864	0.01305	0.09589	0.00108	0.02872	0.00040
GHP-10	0.07691	0.00056	1.87763	0.02320	0.17725	0.00188	0.05314	0.00067
GHP-11	0.05245	0.00096	0.26782	0.00476	0.03707	0.00041	0.01152	0.00021
GHP-12	0.05799	0.00135	0.81420	0.01404	0.07682	0.00101	0.02304	0.00065
GHP-13	0.17159	0.00212	2.09459	0.02373	0.08853	0.00065	0.01764	0.00037
GHP-14	0.06155	0.00072	0.84442	0.00982	0.09960	0.00103	0.03350	0.00056
GHP-15	0.05537	0.00078	0.43927	0.00584	0.05756	0.00060	0.01592	0.00023
GHP-16	0.07077	0.00098	1.36979	0.01657	0.14034	0.00122	1.36979	0.00110
GHP-17	0.05436	0.00078	0.44921	0.00652	0.05994	0.00068	0.44921	0.00050
GHP-18	0.07168	0.00100	1.57602	0.02248	0.15947	0.00183	1.57602	0.00135
GHP-19	0.04922	0.00262	0.17473	0.00898	0.02575	0.00043	0.17473	0.00037
GHP-20	0.05906	0.00092	0.72053	0.01101	0.08846	0.00097	0.72053	0.00079
GHP-21	0.06922	0.00158	1.21378	0.02636	0.12720	0.00158	1.21379	0.00165
GHP-22	0.05291	0.00093	0.36587	0.00624	0.05016	0.00056	0.36587	0.00048
GHP-23	0.05805	0.00099	0.62981	0.01057	0.07870	0.00090	0.62981	0.00088
GHP-24	0.07307	0.00145	1.63513	0.03077	0.16231	0.00184	1.63513	0.00288
GHP-26	0.07191	0.00131	1.51555	0.02607	0.15289	0.00181	1.51555	0.00228
GHP-27	0.05677	0.00147	0.55502	0.01373	0.07091	0.00090	0.55502	0.00108
GHP-28	0.04942	0.00199	0.16060	0.00623	0.02358	0.00034	0.16060	0.00034
GHP-30	0.05492	0.00108	0.45275	0.00856	0.05980	0.00069	0.45275	0.00080
GHP-31	0.05909	0.00120	0.77524	0.01537	0.09517	0.00115	0.77524	0.00144
GHP-32	0.04900	0.00136	0.17608	0.00469	0.02606	0.00032	0.00821	0.00028
GHP-33	0.04913	0.00233	0.16136	0.00741	0.02382	0.00039	0.00641	0.00033
GHP-34	0.05778	0.00108	0.66270	0.01195	0.08318	0.00094	0.02571	0.00077
GHP-35	0.05932	0.00184	0.78435	0.02368	0.09592	0.00140	0.01653	0.00109
GHP-36	0.05610	0.00304	0.50458	0.02612	0.06525	0.00128	0.02034	0.00154
GHP-37	0.05287	0.00165	0.40989	0.01231	0.05623	0.00080	0.01711	0.00081
GHP-38	0.05698	0.00134	0.70520	0.01634	0.08980	0.00120	0.02411	0.00068
GHP-39	0.05848	0.00207	0.81351	0.02749	0.10089	0.00149	0.02612	0.00133
GHP-40	0.06037	0.00097	0.77167	0.01213	0.09271	0.00104	0.02479	0.00079
GHP-41	0.07258	0.00118	1.53173	0.02478	0.15310	0.00177	0.04067	0.00154
GHP-42	0.11061	0.00178	4.89543	0.08038	0.32101	0.00395	0.05069	0.00195
GHP-43	0.05637	0.00114	0.80715	0.01198	0.07813	0.00093	0.02118	0.00072

CORRECTED AGES (COMMON PB)

Analysis No.	$^{207}Pb/^{206}Pb$	±1s	$^{207}Pb/^{235}U$	±1s	$^{206}Pb/^{238}U$	±1s	$^{208}Pb/^{232}Th$	±1s	
(9) GHP2 (R24477), sandstone; Goipin River valley; Late Jurassic; Lat.21°13'23"S Long.161°16'11"E									
GHP-1	561	29	524	5	516	5	533	8	
GHP-2	734	32	670	7	652	7	689	21	
GHP-3	232	38	161	2	156	2	158	2	
GHP-4	663	25	638	5	632	6	661	10	
GHP-5	252	62	160	4	154	2	158	3	
GHP-6	642	26	620	8	615	7	611	11	
GHP-7	508	40	511	7	512	5	547	10	
GHP-8	582	25	578	5	578	6	600	9	
GHP-9	597	37	590	7	589	6	572	8	
GHP-10	1119	25	1073	8	1052	10	1047	17	
GHP-11	305	43	241	4	235	3	234	4	
GHP-12	529	52	486	9	478	6	460	13	
GHP-13	2573	21	1147	8	547	5	353	7	**
GHP-14	659	26	622	5	612	6	666	11	
GHP-15	427	31	370	4	361	4	319	5	
GHP-16	951	29	876	7	847	7	17439	9	
GHP-17	386	33	377	5	375	4	7499	7	
GHP-18	977	29	961	9	954	10	19126	11	
GHP-19	158	122	164	8	164	3	3255	6	
GHP-20	569	35	551	6	547	6	10958	9	
GHP-21	905	48	807	12	772	9	16053	15	
GHP-22	325	41	317	5	316	3	6302	7	
GHP-23	532	38	496	7	488	5	9873	11	
GHP-24	1016	41	984	12	970	10	19584	22	
GHP-26	983	38	937	11	917	9	18646	18	
GHP-27	483	59	448	9	442	5	8923	14	
GHP-28	168	94	151	5	150	2	3010	6	
GHP-30	409	45	379	6	374	4	7548	11	
GHP-31	570	45	583	9	586	7	11501	18	
GHP-32	148	67	165	4	166	2	165	6	
GHP-33	154	109	152	6	152	2	129	7	
GHP-34	521	42	516	7	515	6	513	15	
GHP-35	579	69	588	13	590	8	331	22	
GHP-36	456	123	415	18	407	8	407	31	
GHP-37	323	73	349	9	353	5	343	16	
GHP-38	490	53	542	10	554	7	482	17	
GHP-39	548	79	604	15	620	9	521	26	
GHP-40	617	35	581	7	572	6	495	16	
GHP-41	1002	34	943	10	918	10	806	30	
GHP-42	1809	30	1801	14	1795	19	1003	38	
GHP-43	467	46	482	8	485	6	424	14	N=41

ACCEPTED SET (in ascending age order)

Analysis No.	*Age**	*±1s*	*Groups*	*Age±2s*
(9) GHP2 (R24477), sandstone; Goipin River valley; Late Jurassic; Lat.21°13'23"S Long.161'				
GHP-28	150	2	a	
GHP-33	152	2	a	153±2
GHP-5	154	2	a	n=4
GHP-3	156	2	a	%10
GHP-19	164	3		
GHP-32	166	2		
GHP-11	235	3		
GHP-22	316	3		
GHP-37	353	5		
GHP-15	361	4		
GHP-30	374	4		
GHP-17	375	4		
GHP-36	407	8		
GHP-27	442	5		
GHP-12	478	6		
GHP-43	485	6		
GHP-23	488	5		
GHP-7	512	5		
GHP-34	515	6		
GHP-1	516	5		
GHP-20	547	6		
GHP-38	554	7		
GHP-40	572	6		
GHP-8	578	6	b	585±7
GHP-31	586	7	b	n=4
GHP-9	589	6	b	%10
GHP-35	590	8	b	n=27
GHP-14	612	6		
GHP-6	615	7		
GHP-39	620	9		
GHP-4	632	6		
GHP-2	652	7		
GHP-21	772	9		
GHP-16	847	7		
GHP-26	917	9		
GHP-41	918	10		
GHP-18	954	10		
GHP-24	970	10		
GHP-10	1119	25		
GHP-42	1809	30	N=40	

K	0	0
J	6	15
T	1	3
P	0	0
C	2	5
DS	5	13
CO	6	15
PC	20	50
n=	40	GHP1

NOTES
s: standard error
* Ages <1000 Ma are $^{206}Pb/^{238}U$; >1000 Ma are $^{207}Pb/^{206}Pb$ data
** discordant age data
Yellow boxes show the number of zircons, and their percentage of total, in selected geological periods.

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