Confronto tra il limite Norico/Retico e il limite Warepiano/Otapiriano (Nuova Zelanda) attraverso la curva isotopica del carbonio organico

Laurea Triennale in Scienze Geologiche
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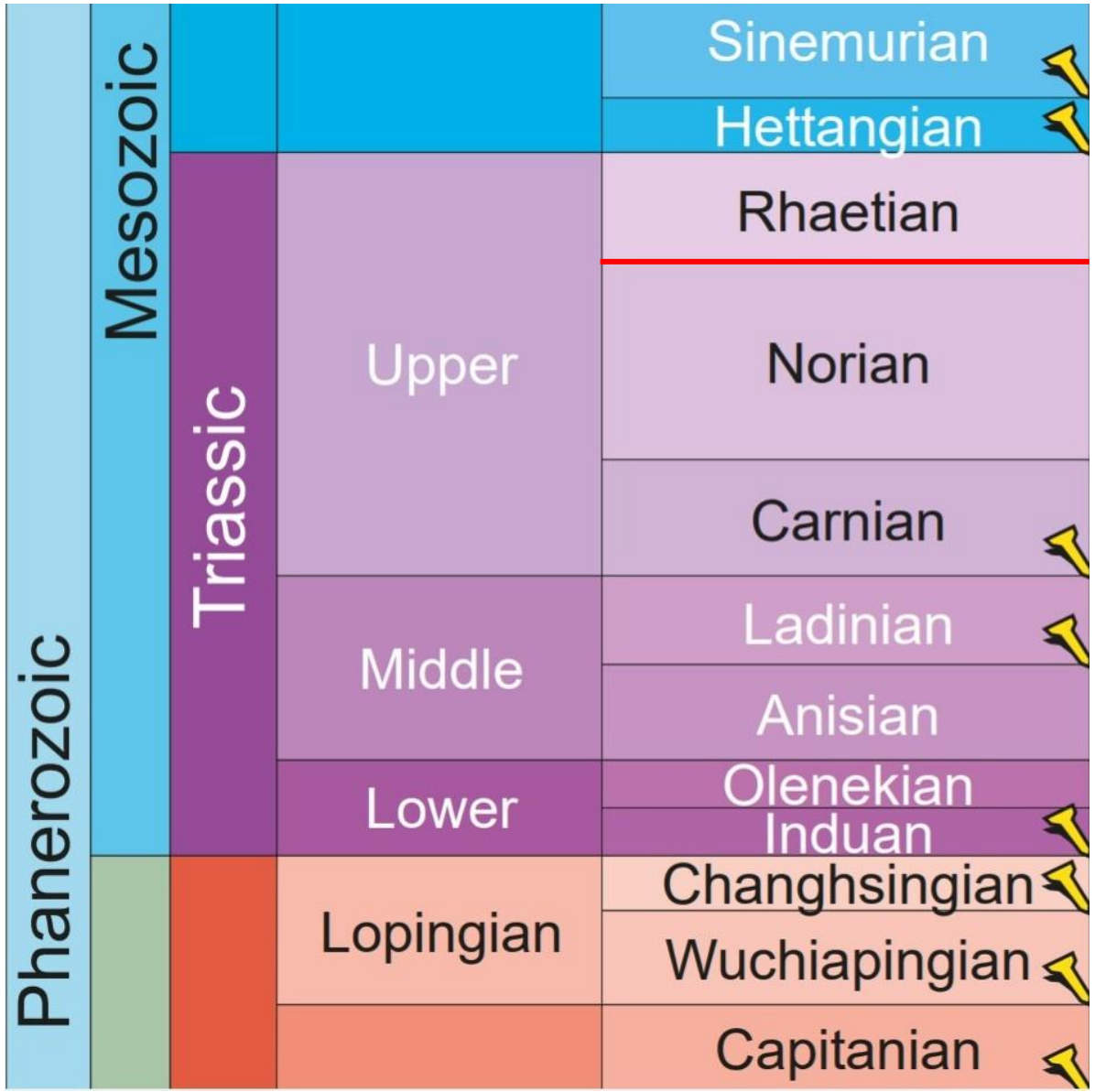
Scopo

Confrontare i limiti Norico/Retico (NRB) e Warepiano/Otapiriano (WOB) tramite tecniche geochimiche e biostratigrafiche condotte nelle sezioni di Pignola-Abriola (Italia) e Kiritehere (Nuova Zelanda)



Herangi Series	H	Ururoan	Hu
		Aratauran	Ha
Balfour Series	B	Otapirian	Bo
		Warepan	Bw
		Otamitan	Bm
		Oretian	Br
Gore Series	G	Kaihikuan	Gk
		Etalian	Ge
		Malakovian	Gm
		Nelsonian	Gn

FO di *M. posthernsteini* è stato votato dal Working Group del Retico (Krystyn, 2010)

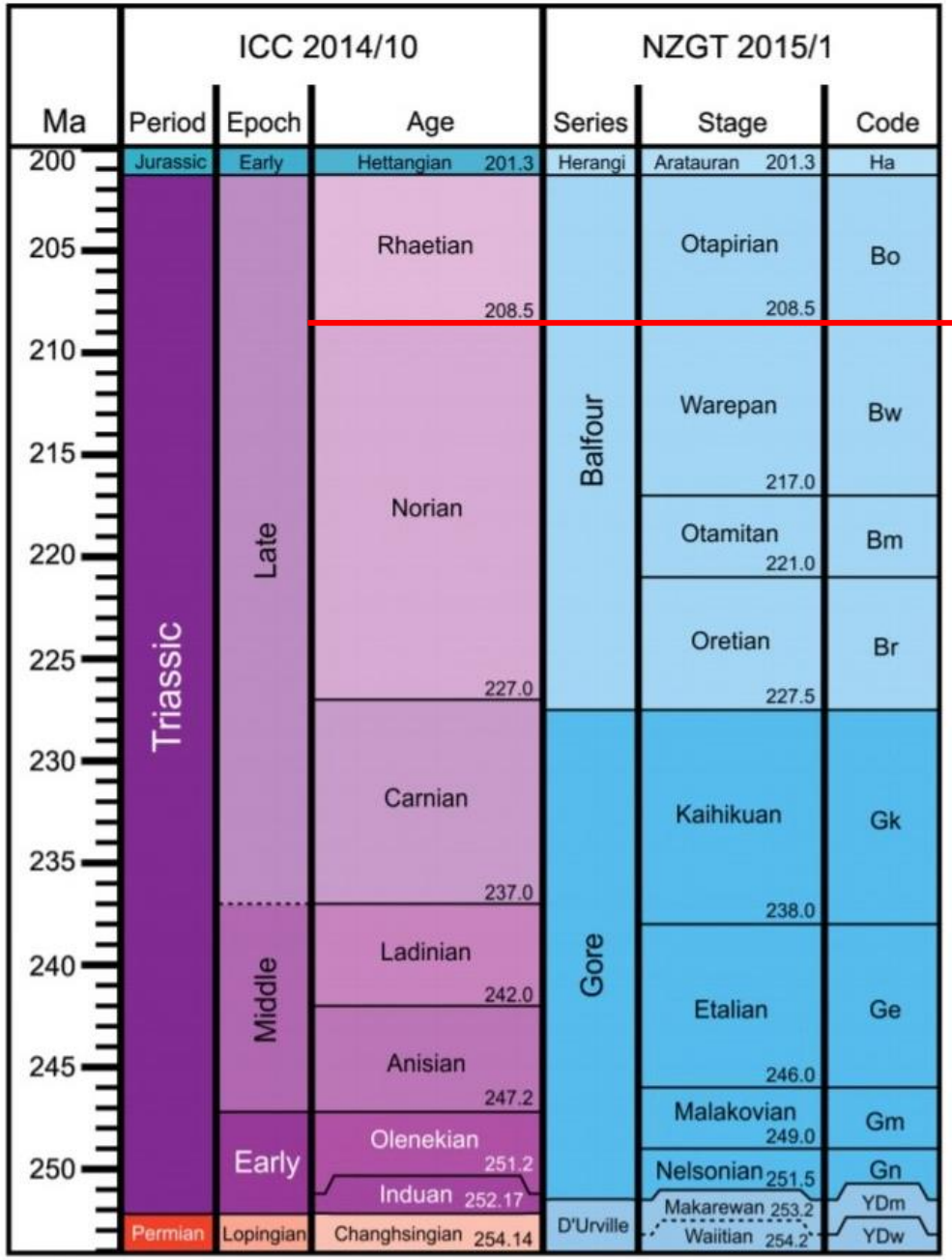


Figure 6 Triassic Timescale. The 2015 calibration of Balfour and Gore Series stages with the Global Geochronological Scale for the Triassic Period, as published in the 2014 International Chronostratigraphic Chart (ICC 2010/10, Cohen et al. 2014).

"We arbitrarily equate the base of the Otapirian Stage with the base […] of the Rhaetian Stage"
Raine et al. (2015), NZGTS 2015

È necessario uno strumento utile a calibrare i due limiti

- biostratigrafia
- chemostratigrafia

PIGNOLA - ABRIOLA

PIGNOLA - ABRIOLA

LITOSTRATIGRAFIA

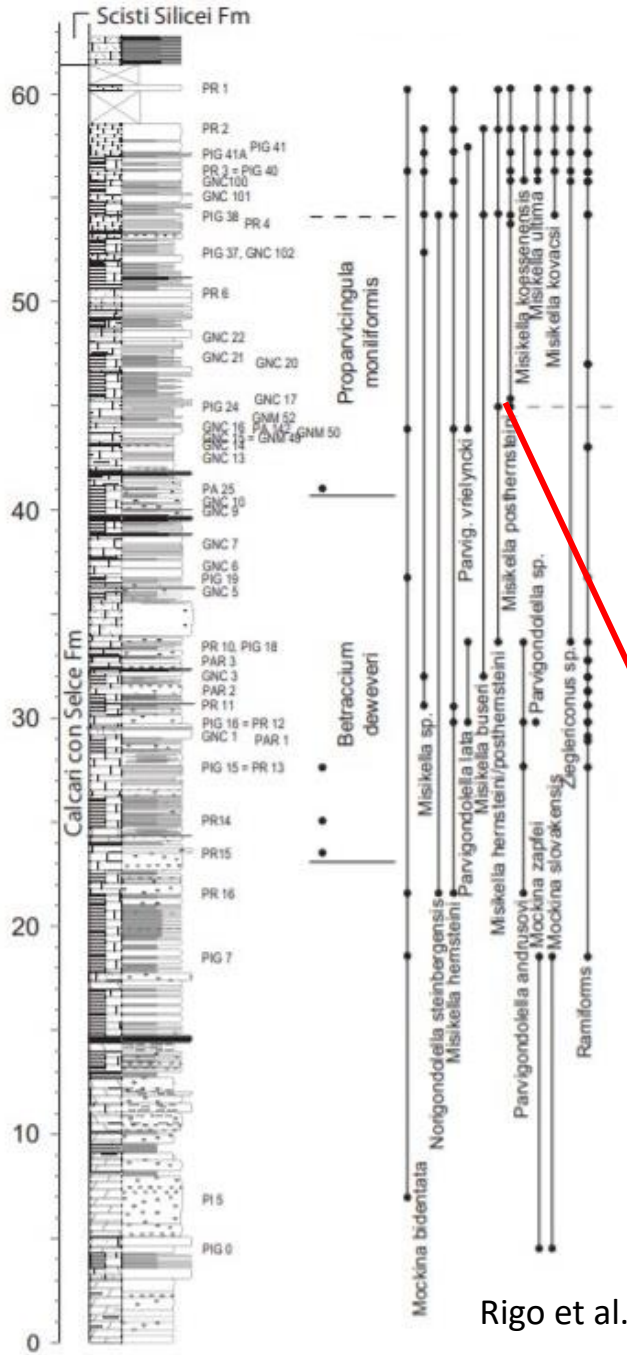
Calcari con selce

Calcari micritici con abbondanti radiolari e bivalvi, con intercalazioni di calcareniti dovute a eventi gravitativi

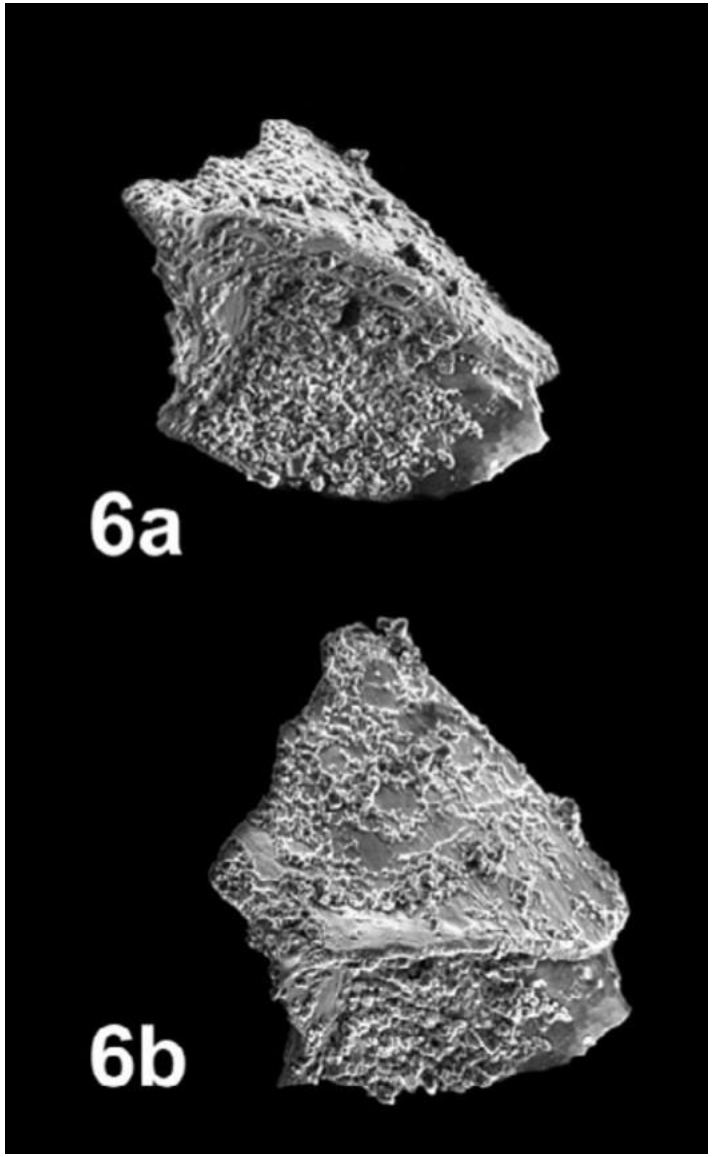
BIOSTRATIGRAFIA

Limite NRB posto con la comparsa di *Misikella posthernsteini*

FO di *M. posthernsteini* è stato votato dalla Working Group del Retico (Krystyn, 2010)



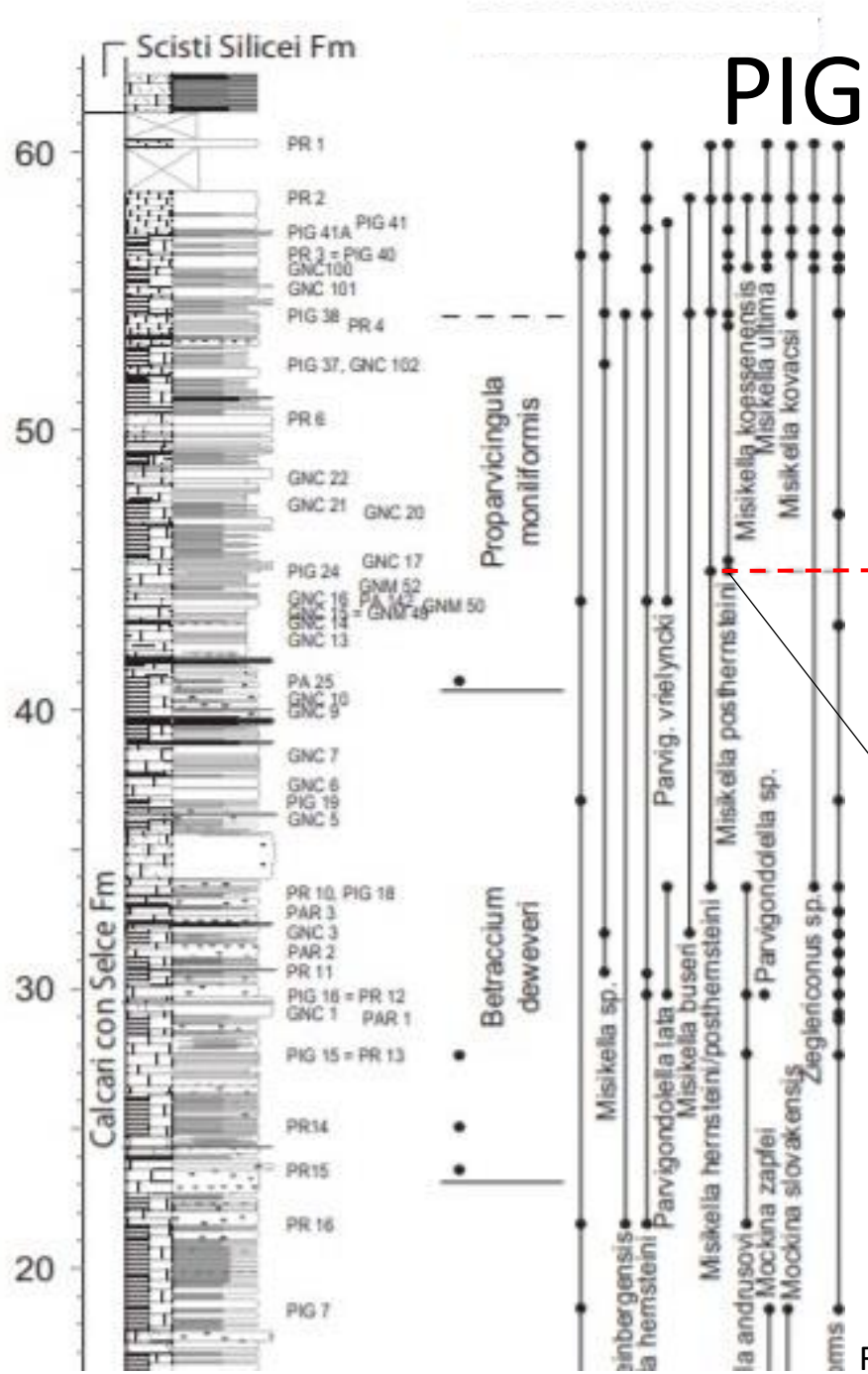
Rigo et al. 2016, Lethaia



SEM micrographs of upper Norian to Rhaetian conodonts: *Misikella posthernsteini.*
Rigo et al. 2016, Lethaia

PIGNOLA - ABRIOLA

CHEMOSTRATIGRAFIA



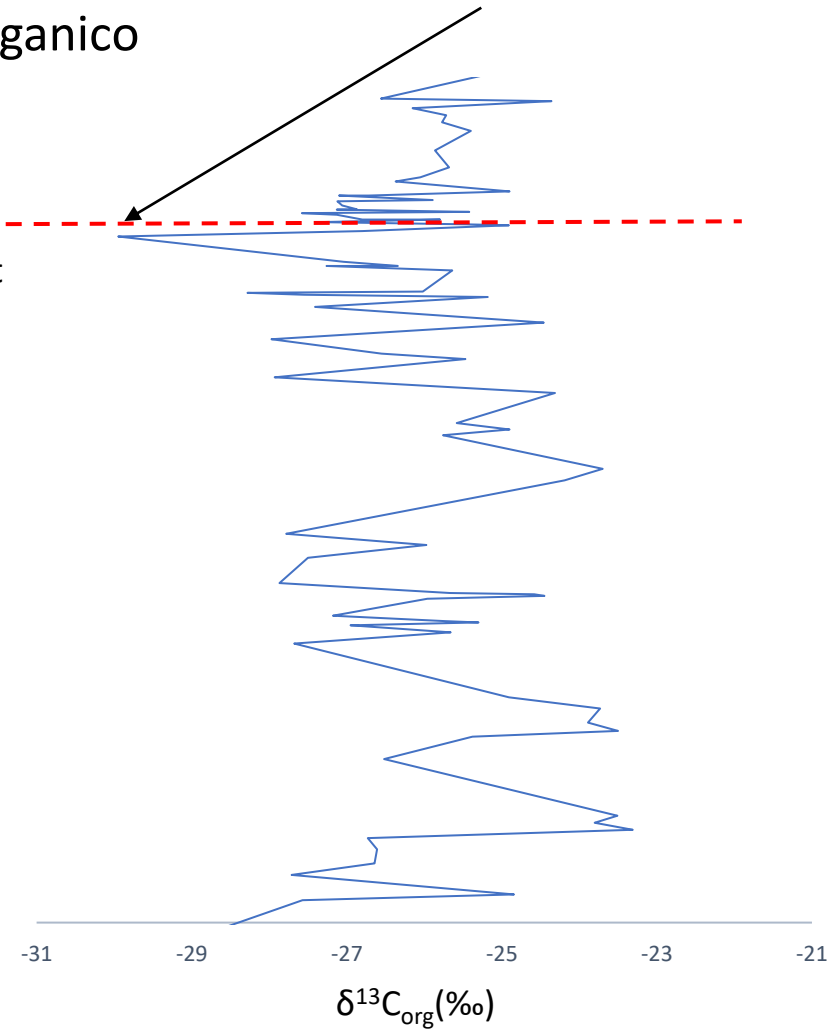
È stata studiata la curva isotopica del carbonio organico

Picco negativo di $\delta^{13}C_{org}$

Limite NRB

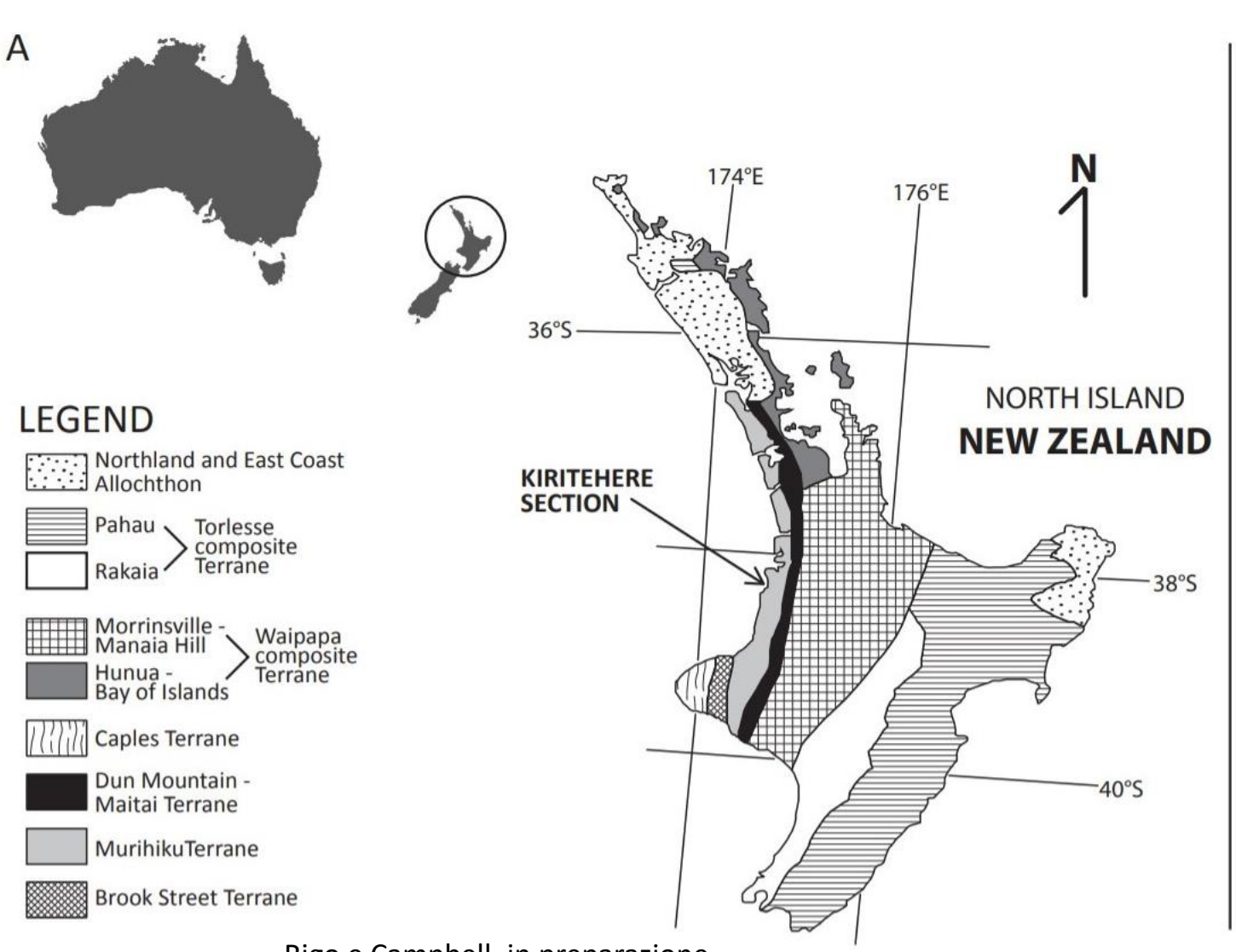
Posto 0,5 metri sopra allo shift negativo di $\delta^{13}C_{org}$

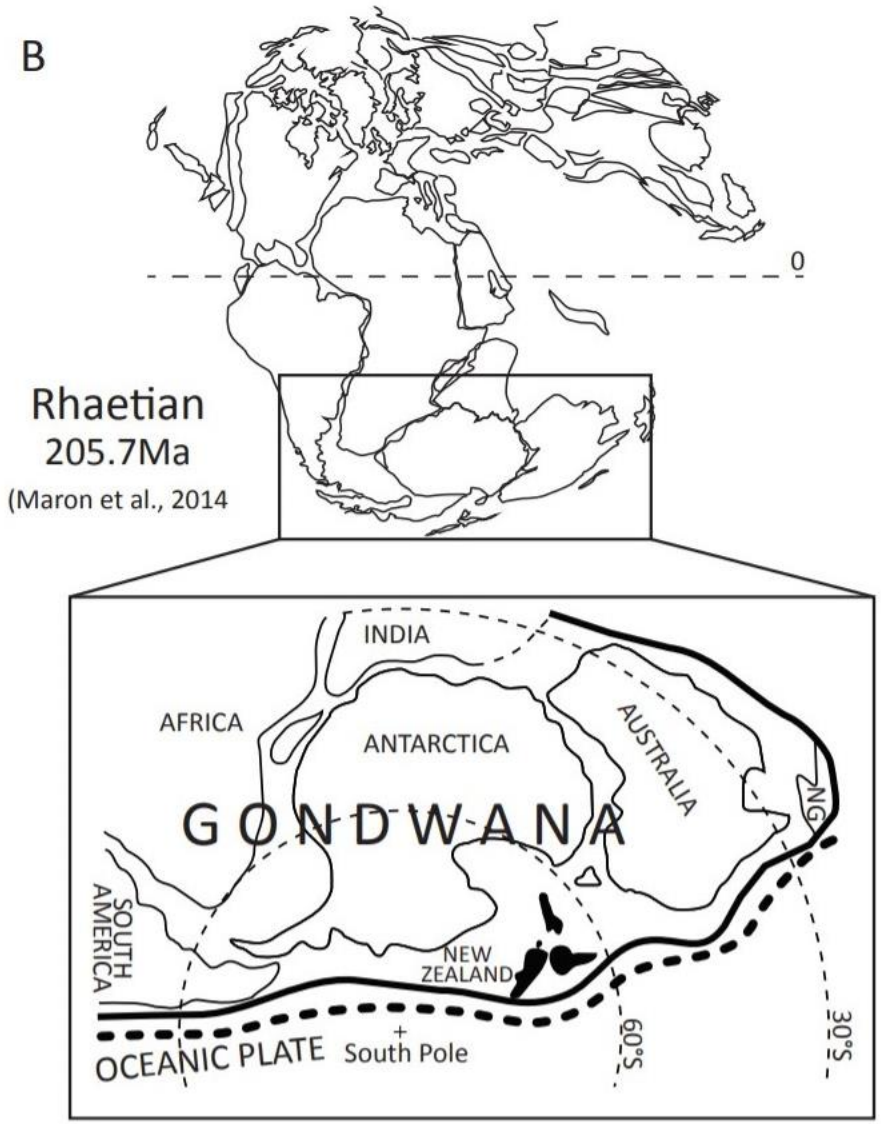
Misikella posthersteini



Rigo et al. 2016, Lethaia

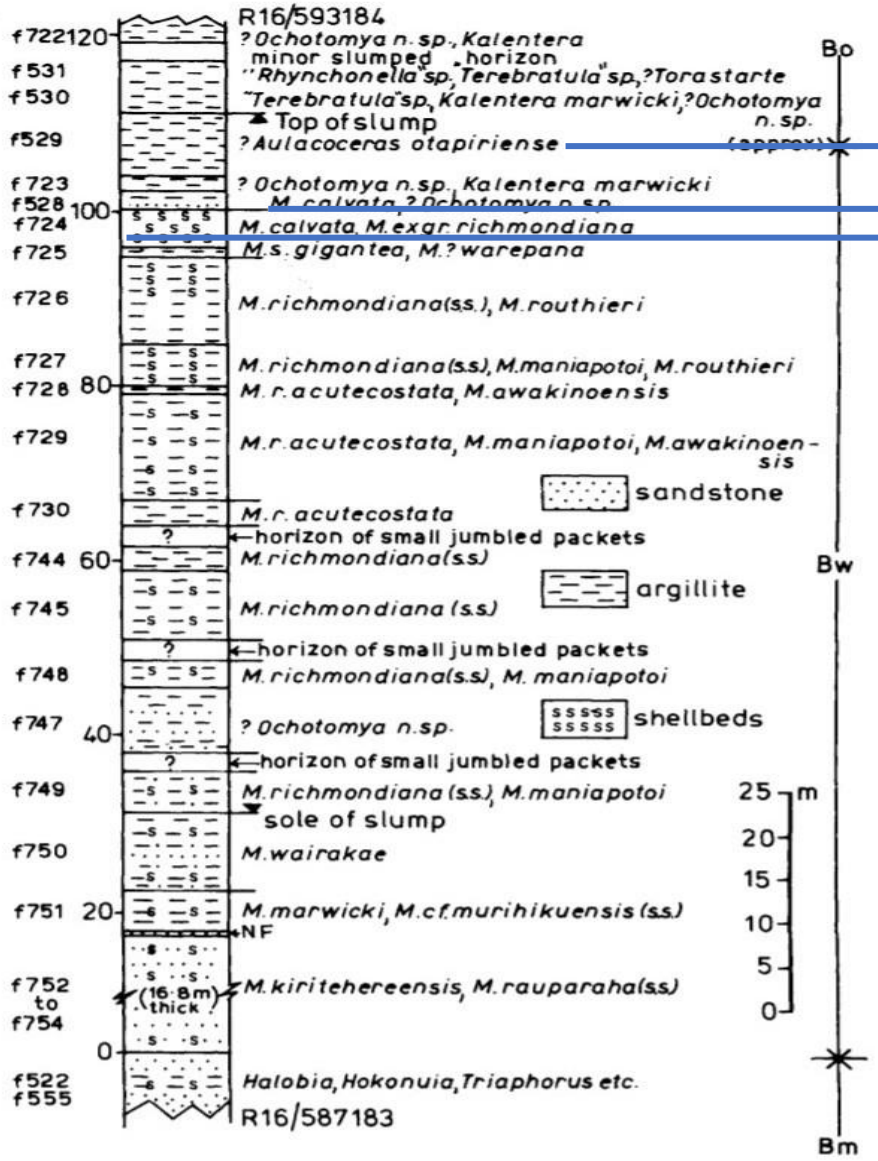
KIRITEHERE COASTAL SECTION
Southwest Auckland





Rigo e Campbell, in preparazione

KIRITEHERE COASTAL SECTION



Grant-Mackie, 1981, Warepan

BIOSTRATIGRAFIA

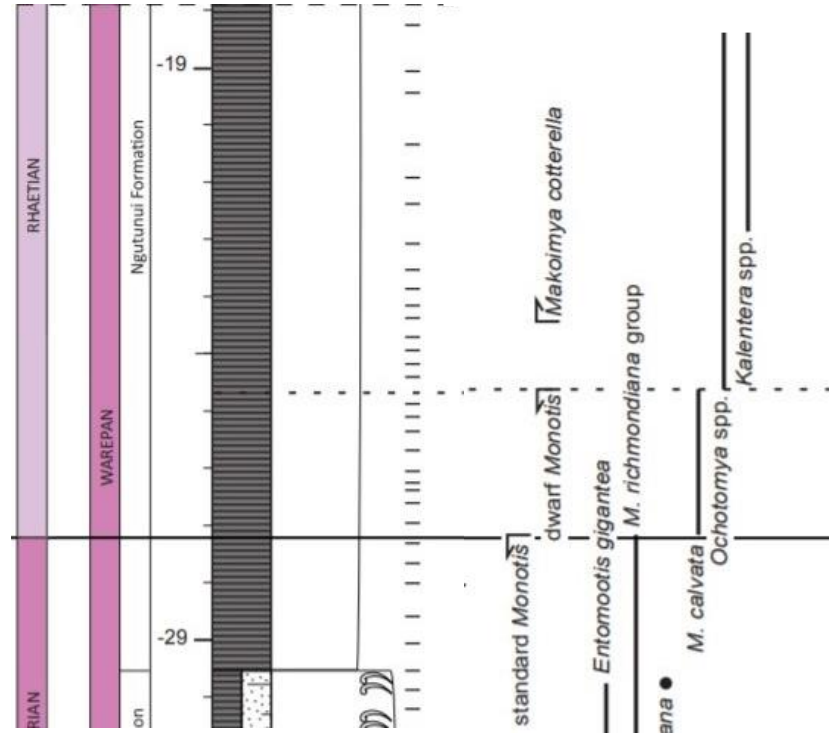
Comparsa *Aulacoceras otapiriense*: limite Warepan/Otapirian

Scomparsa *Monotis calvata*

Scomparsa standard *Monotis*

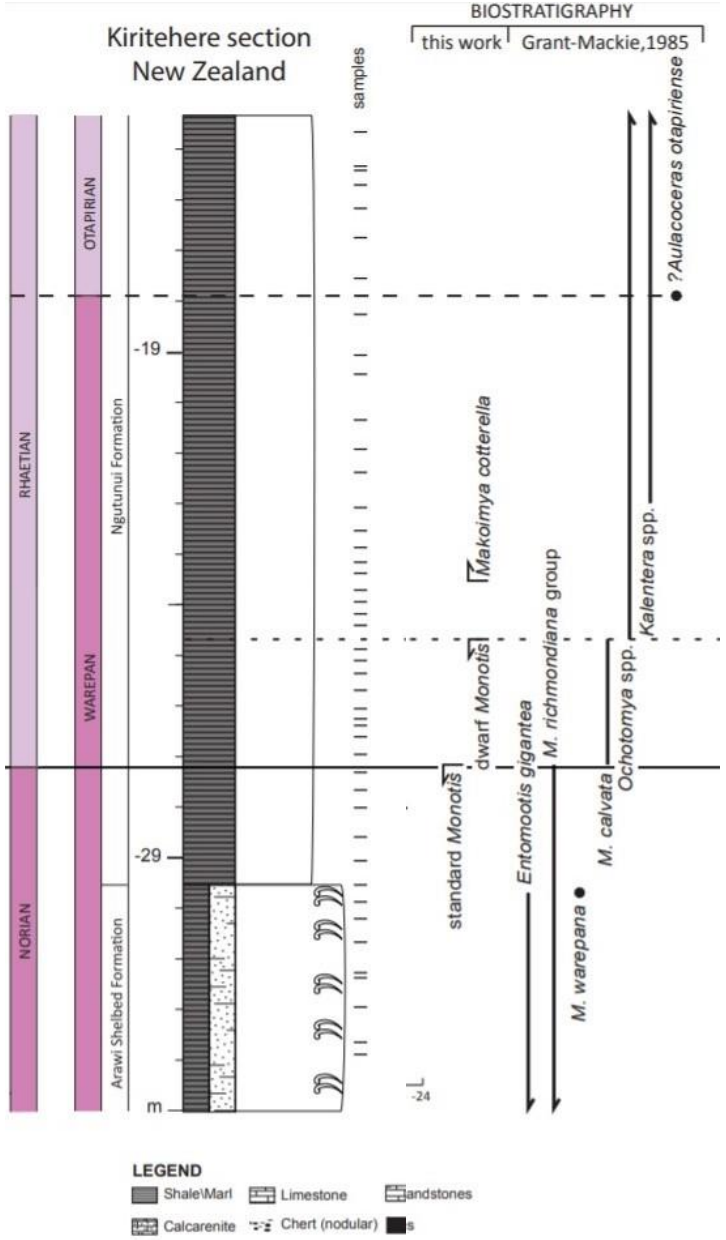
LITOSTRATIGRAFIA

- **Ngutunui Formation**: vulcano siltiti e shale con bivalvi rari
- **Arawi Shellbed Formation**: vulcano siltiti e vulcanoareniti di grana più grossolana ricche in bivalvi



Grant-Mackie, 1985

KIRITEHERE COASTAL SECTION

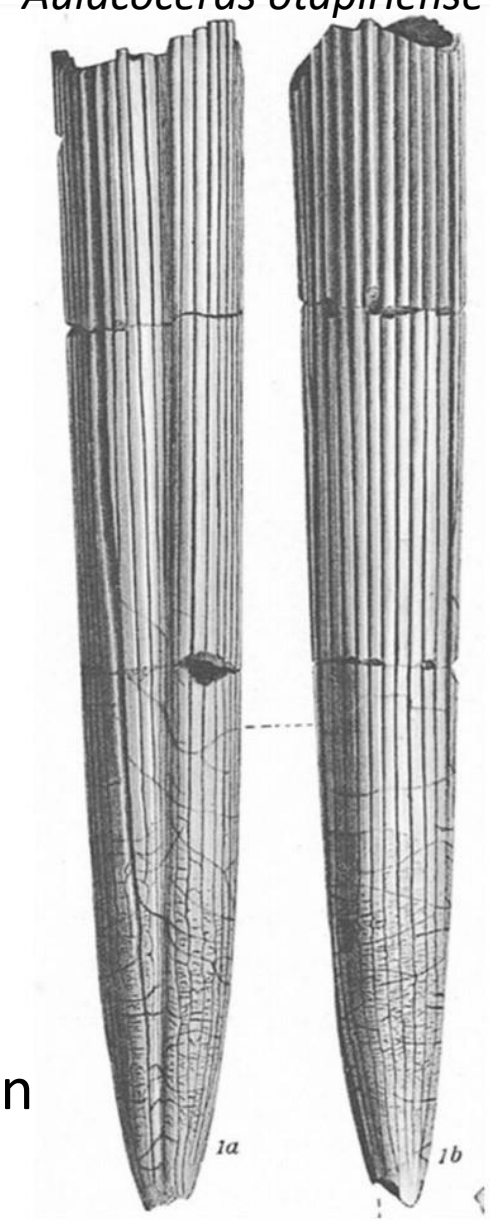


- La definizione di Otapiriano è stata data in base ad un brachiopode: FAD *Rastelligera diomedea*

Rastelligera diomedea
J.D. Campbell, 1968

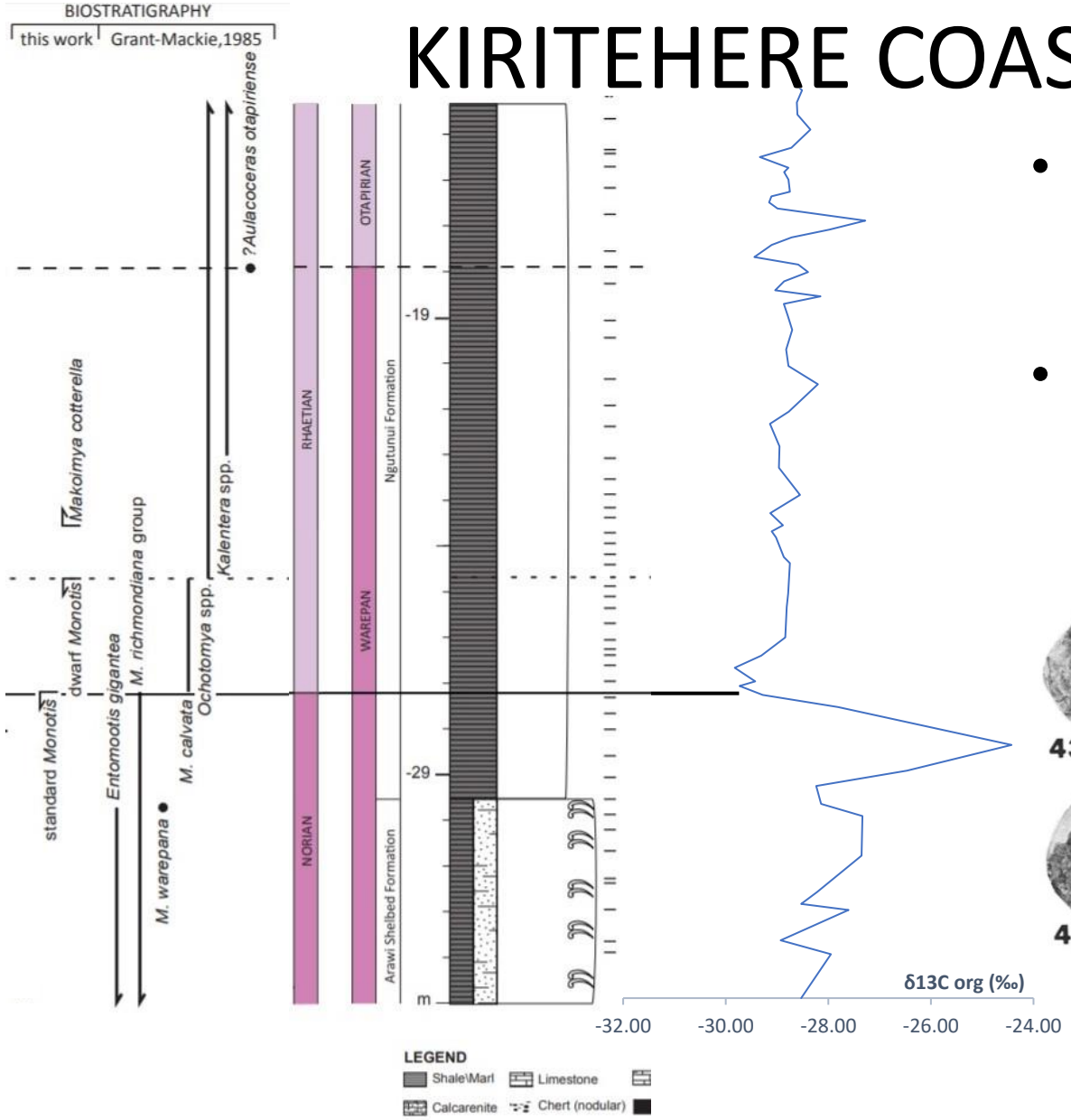
- *R. diomedea* è stata trovata nella "sezione tipo" presso il fiume Otapirian ma no a Kiritehere
- Per questo motivo il WOB è stato approssimato alla comparsa di *Aulacoceras otapiriense*

Aulacoceras otapiriense

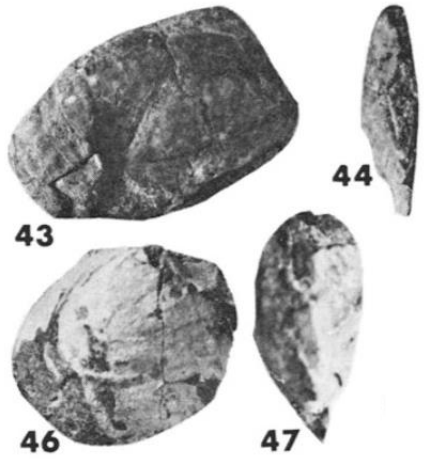


Von Bulow, 1915

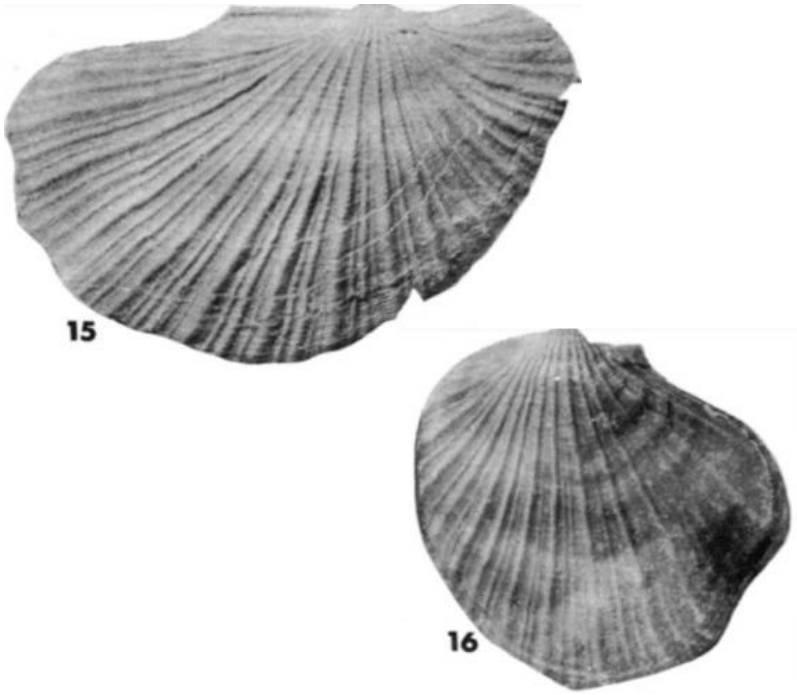
KIRITEHERE COASTAL SECTION



- Curva isotopica del $\delta^{13}C_{org}$ con trend negativo simile a quello di Pignola-Abriola
- Corrisponde alla scomparsa dei *Monotis* standard (dimensioni > 6 cm)



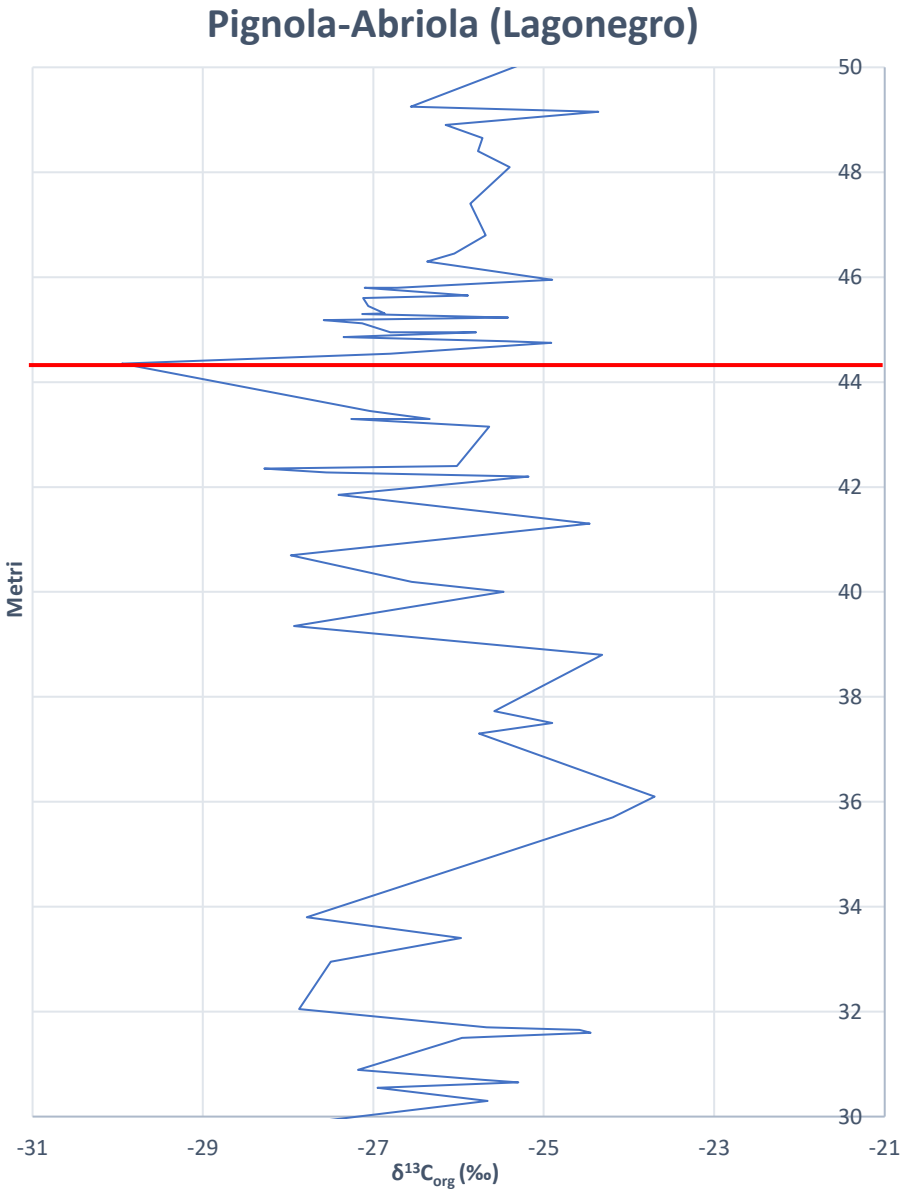
Monotis calvata
Grant-Mackie, 1978

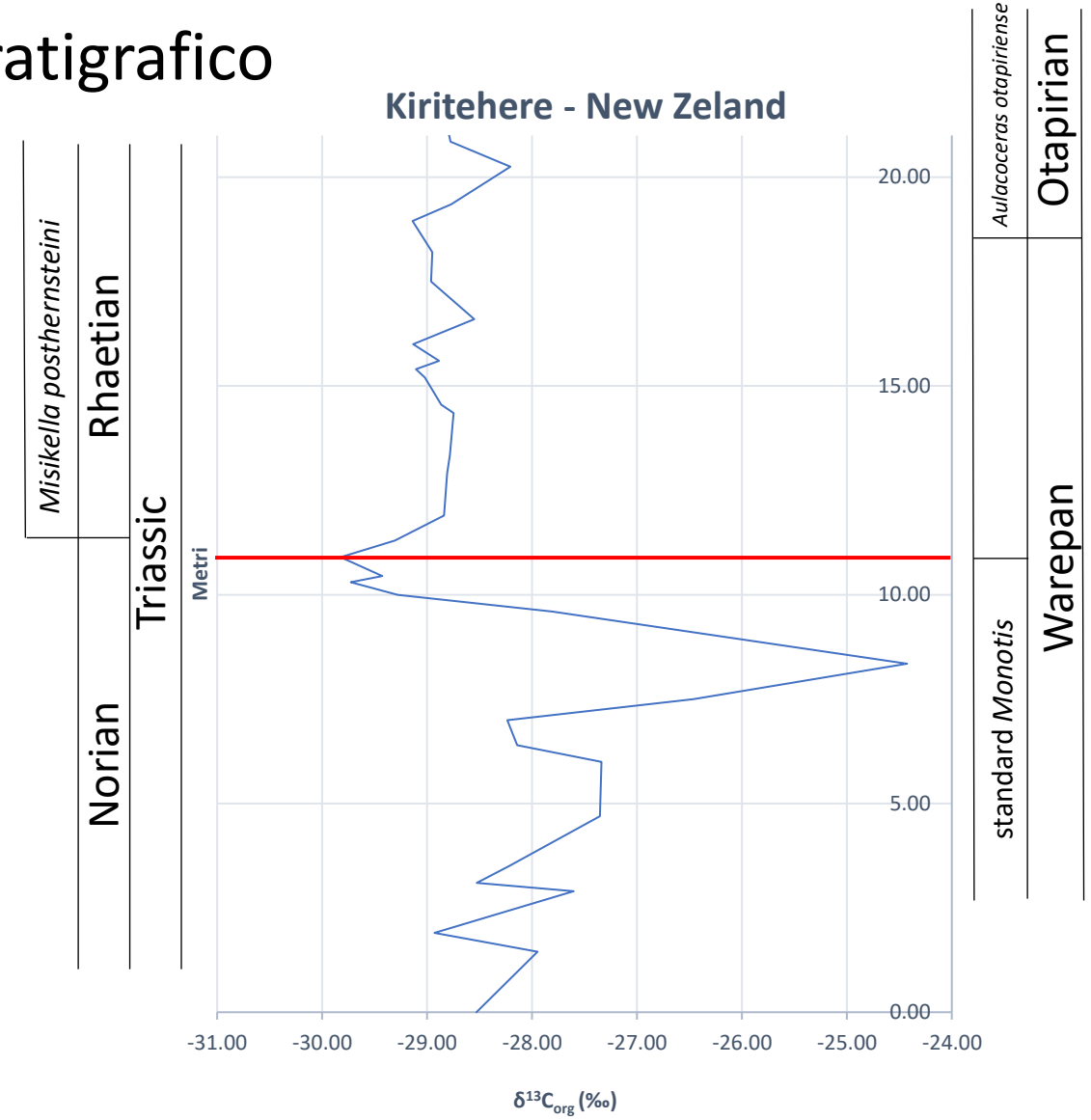


Monotis (Entomonotis) s. gigantea
Grant-Mackie, 1978

- Alla scomparsa del *Monotis* standard è associato il limite Norico/Retico (Rigo et al. 2016)

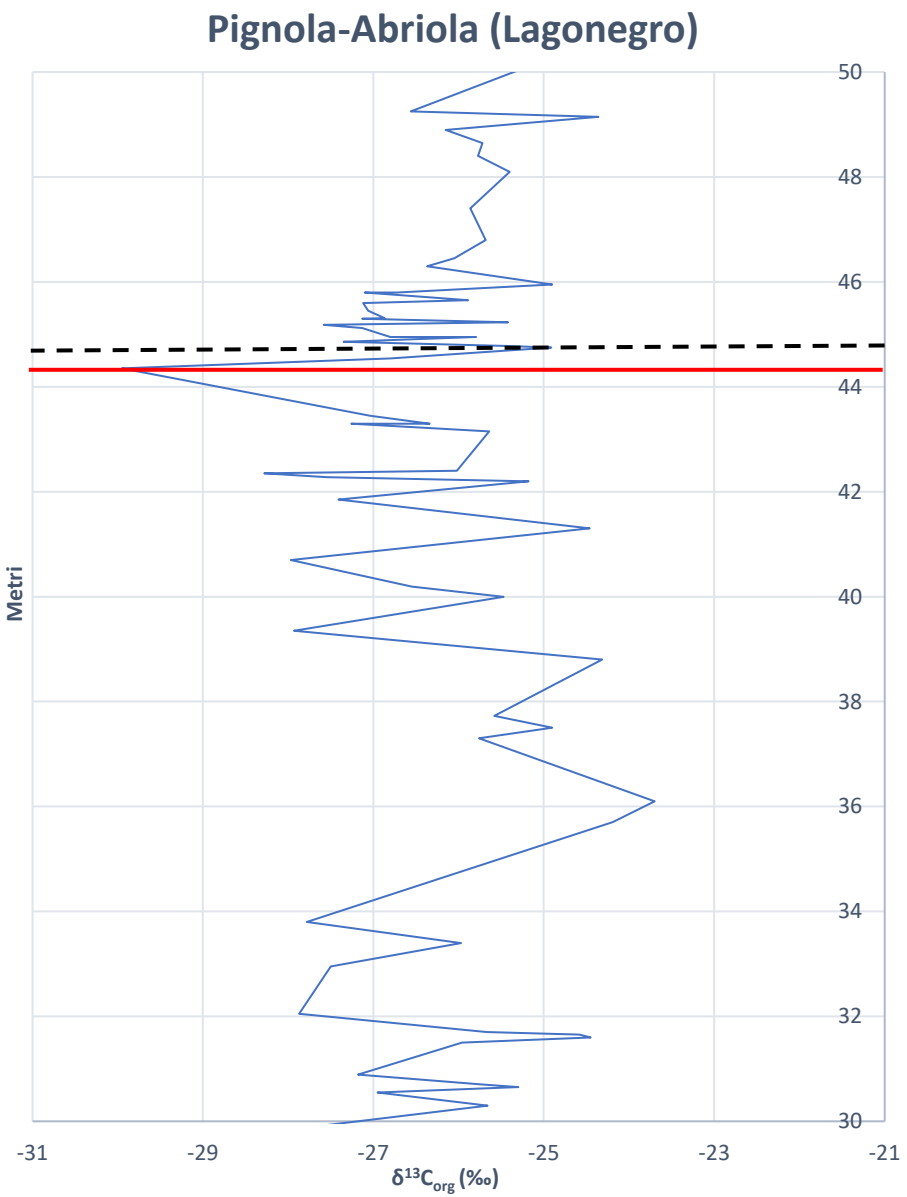
Correlazione con metodo chemostratigrafico

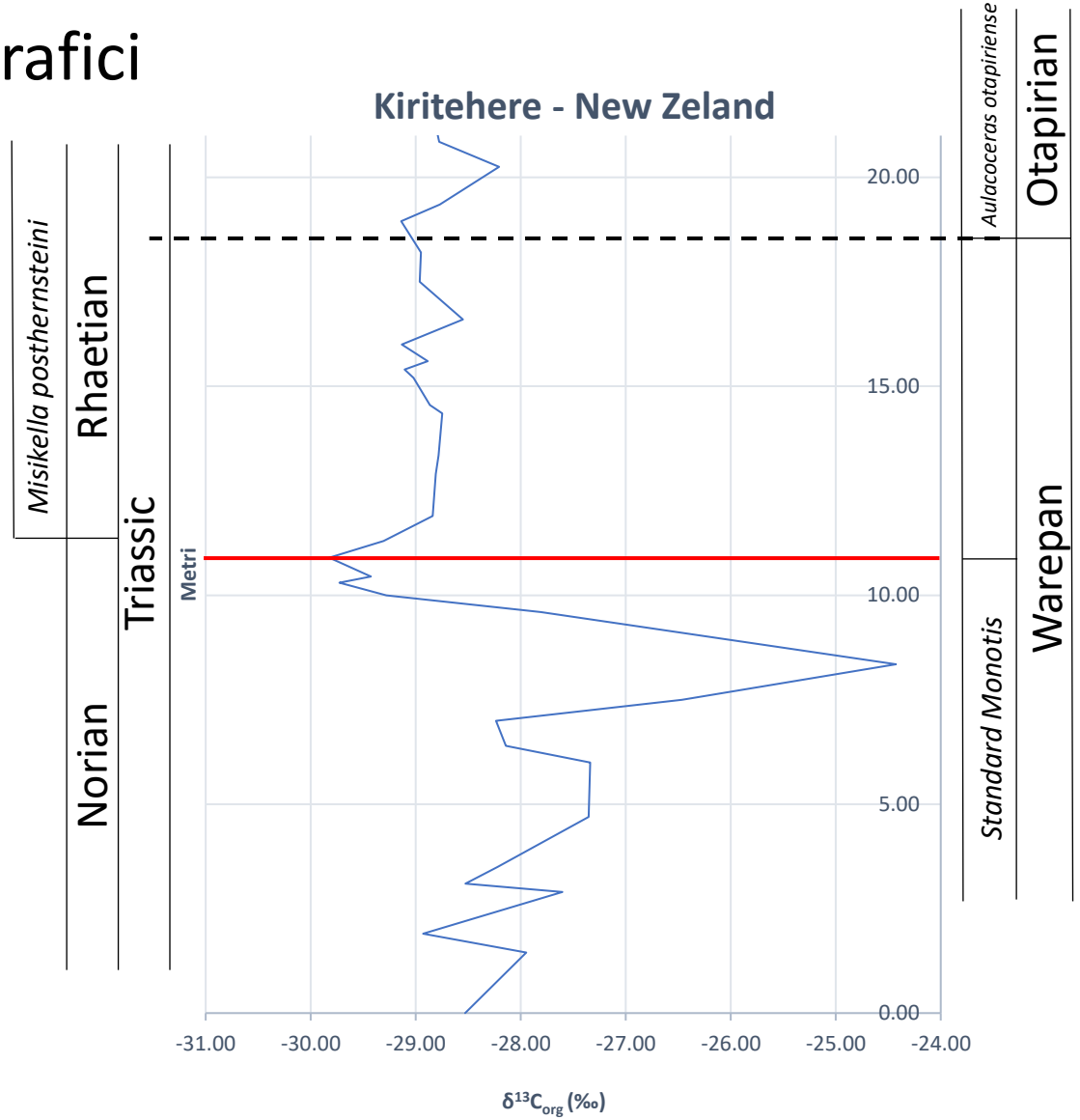




Limite NRB approssimato allo shift negativo di $\delta^{13}C_{org}$ trovato nei campioni della Kiritehere section e di Pignola-Abriola

Considerando anche i dati biostratigrafici





- NRB assegnato alla comparsa di *Misikella posthernsteini*, mezzo metro sopra lo shift negativo di $\delta^{13}C_{org}$.
- WOB assegnato alla comparsa di *Aulacocera otapiriense*

CONCLUSIONI

- Trend negativo del carbonio organico (chemostratigrafia)
- Distribuzione delle specie: *Misikella posthernsteini, Aulacoceras otaipirense,* standard *Monotis, Monotis calvata,* dwarf *Monotis, Rastelligera diomedea* (biostratigrafia)
- Individuati i limiti NRB e WOB distinti su due livelli ben diversi della sezione
- NRB e WOB non possono essere “considerati arbitrariamente uguali”
- Il limite Warepiano/Otapiriano è da considerare più “giovane” rispetto al limite Norico/Retico

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