

## 1. Introductory information

Title of the dataset: Laser ablation Mn/Ca ratios of single foraminiferal shells from the Gulf of Lions

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This data set contains Mn/Ca as measured on single foraminiferal shells

Format of the file: Excel file

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## 2. Methodological information

Foraminiferal trace element concentrations were determined using two laser ablation ICP-MS systems. Prior to laser ablation, all samples were gently cleaned in methanol (x1) and UHQ water (x4). Between each rinse, the samples were placed in a sonic bath for several seconds to thoroughly clean the tests. Benthic foraminifera from 745m (station D), 980m (station C), 1488m (station B), and 1987m (station A) were measured at Utrecht University using a deep UV (193 nm) ArF excimer laser (Lambda Physik) with GeoLas 200Q optics. Ablation was performed at a pulse repetition rate of 10 Hz and an energy density of 1.4 J/cm<sup>2</sup>, with a crater size of 80 µm. Ablated particles were measured by a quadrupole ICP-MS (Micromass Platform) equipped with a collision and reaction cell. Such a collision and reaction cell improves carbonate analyses by eliminating interferences on mass 44. Scanned masses included 24Mg, 26Mg, 27Al, 42Ca, 43Ca, 55Mn, 88Sr, 137Ba, 138Ba, and 208Pb. Benthic foraminifera from stations F (350 m) and E (552 m) were analyzed at ETH Zurich (due to laboratory renovations at Utrecht University). The laser type and ablation parameters were identical to those detailed above. The ablated particles were measured using a quadrupole ICP-MS (ELAN 6100 DRC, PerkinElmer). In both cases, calibration was performed using an international standard (NIST610) with Ca as an internal standard (Jochum et al., 2011). The same masses as measured in Utrecht were monitored, in addition to 7Li, 23Na, 47Ti, 60Ni, 61Ni, and 89Y. Interlaboratory compatibility was monitored using a matrix-matched calcite standard. For Mn, reported here, this standard showed a precision better than 3% over all analyses, at ETH and UU, and with an offset of less than 5% from an offline-determined (solution ICP-AES) concentration analysing discrete subsamples. The matrix-matched standard is routinely included in the analyses and has been monitored since 2010 at Utrecht University.

Analytical error (equivalent to 1 sigma), based on repeated measurement of an external standard, was < 5% for reported elements. Each laser ablation measurement was screened for contamination by monitoring Al and Pb. On encountering surface contamination, the data integration interval was adjusted to exclude any Al or Pb enrichment. Cross-plots between Al and Pb versus Mn showed that they are unrelated, confirming the accuracy of the integrations.

### 3. Data specific information

Individual sheets of Excel refer to the different stations sampled. On each sheet the first column shows code for station. Second column the species analyzed. The third column the sampled interval with respect to the sediment-water interface. The fourth column shows the average depth. The last column shows the Mn/Ca ratio in micro mole per mole. When values were below detection limit this is indicated by <d.l.. Within each sheet the analyses are ordered according to sample depth

### 4. Sharing and Access information

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