**Supplementary information for “Zebra rock and other Ediacaran paleosols from Western Australia” by G. J. Retallack, 2020, Australian Journal of Earth Sciences**

These are tabulations of chemical and petrographic data for fossil soils from Western Australia to supplement a published paper**.**

**Table S1.** Major element chemical composition (wt %) by XRF of selected samples.

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Pedo-type. | R- | SiO2 | TiO2 | Al2O3 | Fe2O3 | FeO | CaO | MgO | Na2O | K2O | MnO | P2O5 | SrO | BaO | LOI | Total | g/cc |
| Waj. | 5668 | 56.34 | 0.95 | 19.91 | 13.76 | 0.33 | 0.01 | 0.08 | 0.03 | 0.33 | <0.01 | 0.11 | 0.11 | 0.007 | 7.70 | 99.04 | 2.6111 |
| Waj. | 5669 | 56.57 | 0.98 | 20.98 | 12.67 | 0.13 | 0.01 | 0.08 | 0.03 | 0.33 | <0.01 | 0.10 | 0.11 | 0.010 | 7.83 | 99.42 | 2.5817 |
| Waj. | 5670 | 60.68 | 0.90 | 19.92 | 9.61 | 0.13 | 0.01 | 0.07 | 0.03 | 0.33 | <0.01 | 0.08 | 0.09 | 0.007 | 7.47 | 98.90 | 2.6773 |
| Waj. | 5670R | 45.97 | 0.67 | 15.77 | 30.15 | 0.65 | 0.02 | 0.07 | 0.04 | 0.33 | <0.01 | 0.07 | 0.06 | 0.010 | 6.00 | 98.90 | 2.6773 |
| Waj. | 5670W | 66.52 | 1.06 | 22.1 | 0.63 | 0.13 | 0.01 | 0.08 | 0.04 | 0.33 | <0.01 | 0.11 | 0.12 | 0.007 | 8.27 | 98.96 | 2.6773 |
| Waj. | 5671 | 68.36 | 0.89 | 19.66 | 3.44 | 0.39 | 0.01 | 0.08 | 0.04 | 0.34 | <0.01 | 0.07 | 0.07 | 0.007 | 7.27 | 99.93 | 2.6141 |
| Waj. | 5672 | 59.34 | 0.98 | 25.42 | 3.17 | 0.01 | 0.02 | 0.12 | 0.07 | 0.42 | <0.01 | 0.10 | 0.07 | 0.020 | 9.53 | 99.27 | 2.6055 |
| Waj. | 5673 | 56.73 | 0.94 | 26.02 | 4.44 | 0.26 | 0.01 | 0.12 | 0.05 | 0.38 | <0.01 | 0.08 | 0.05 | 0.020 | 9.69 | 98.54 | 2.4483 |
| Waj. | 5674 | 57.49 | 0.94 | 25.70 | 4.61 | 0.20 | 0.01 | 0.12 | 0.05 | 0.38 | <0.01 | 0.08 | 0.05 | 0.020 | 9.49 | 98.95 | 2.8912 |
| Waj. | 5675 | 71.72 | 0.73 | 17.11 | 1.91 | 0.59 | 0.01 | 0.11 | 0.06 | 0.53 | <0.01 | 0.06 | 0.04 | 0.020 | 6.72 | 99.02 | 2.6600 |
| Waj. | 5676 | 62.20 | 0.93 | 23.90 | 5.73 | 0.13 | 0.02 | 0.05 | 0.02 | 0.56 | <0.01 | 0.09 | 0.07 | 0.010 | 8.18 | 101.77 | 2.5916 |
| Waj. | 5677 | 60.10 | 0.92 | 24.30 | 5.82 | 0.13 | 0.01 | 0.05 | 0.02 | 0.58 | <0.01 | 0.09 | 0.07 | 0.010 | 8.50 | 100.48 | 2.6028 |
| Waj. | 5678 | 59.80 | 0.91 | 24.10 | 5.63 | 0.07 | 0.01 | 0.05 | 0.02 | 0.56 | <0.01 | 0.09 | 0.07 | 0.010 | 8.47 | 99.73 | 2.6096 |
| Waj. | 5679 | 65.50 | 0.70 | 21.30 | 2.78 | 0.13 | 0.01 | 0.04 | 0.02 | 0.44 | <0.01 | 0.06 | 0.05 | 0.010 | 7.49 | 98.40 | 2.5216 |
| Gal. | 5754 | 77.79 | 0.07 | 1.69 | 1.32 | 0.62 | 5.7 | 3.82 | 0.007 | 0.43 | 0.21 | 0.03 | 0.007 | 0.01 | 8.87 | 99.94 | 2.3019 |
| Gal. | 5755 | 78.03 | 0.16 | 3.58 | 2.4 | 0.59 | 4.32 | 2.97 | 0.02 | 0.8 | 0.13 | 0.04 | 0.007 | 0.02 | 7.26 | 99.73 | 2.2011 |
| Gal. | 5756 | 81.19 | 0.06 | 1.14 | 0.98 | 0.42 | 5.17 | 2.92 | 0.007 | 0.29 | 0.16 | 0.02 | 0.007 | 0.01 | 7.49 | 99.43 | 2.3034 |
| Gal. | 5757 | 82.98 | 0.06 | 1.41 | 1.04 | 0.52 | 4.32 | 2.62 | 0.008 | 0.35 | 0.17 | 0.02 | 0.007 | 0.02 | 6.63 | 99.62 | 2.3983 |
| Gal. | 5761 | 81.71 | 0.15 | 3.48 | 2.21 | 0.59 | 2.86 | 2.53 | 0.02 | 0.8 | 0.14 | 0.04 | 0.007 | 0.02 | 5.61 | 99.57 | 2.3095 |
| Gal. | 5763 | 80.7 | 0.17 | 3.14 | 1.98 | 0.59 | 3.25 | 2.56 | 0.03 | 0.72 | 0.14 | 0.03 | 0.007 | 0.01 | 6.02 | 98.75 | 2.3825 |
| Gal. | 5764 | 80.28 | 0.13 | 3.01 | 2.1 | 0.78 | 3.67 | 2.7 | 0.03 | 0.67 | 0.13 | 0.03 | 0.007 | 0.01 | 6.48 | 99.24 | 2.3750 |
| Gal. | 5765 | 83.95 | 0.14 | 3.09 | 2.13 | 0.59 | 2.36 | 2.03 | 0.02 | 0.68 | 0.11 | 0.03 | 0.007 | 0.01 | 4.69 | 99.24 | 2.3209 |
| Gal. | 5766 | 79.88 | 0.07 | 1.66 | 1.38 | 0.65 | 5.06 | 2.86 | 0.03 | 0.35 | 0.13 | 0.02 | 0.007 | 0.01 | 7.48 | 99.02 | 2.5562 |
| Gal. | 5767 | 80.36 | 0.16 | 3.39 | 2.31 | 0.78 | 3.33 | 2.58 | 0.03 | 0.76 | 0.13 | 0.04 | 0.007 | 0.02 | 6.04 | 99.15 | 2.3683 |
| Tham. | 5769 | 63.83 | 0.74 | 18.14 | 8.87 | 0.13 | 0.03 | 0.07 | 0.04 | 0.28 | <0.01 | 0.08 | 0.04 | 0.02 | 6.79 | 98.94 | 2.6148 |
| Tham. | 5770 | 68.92 | 0.81 | 19.58 | 1.39 | 0.13 | 0.03 | 0.09 | 0.04 | 0.3 | <0.01 | 0.09 | 0.04 | 0.02 | 7.36 | 98.67 | 2.5012 |
| Tham. | 5771 | 69.46 | 0.64 | 17.82 | 4.18 | 0.13 | 0.02 | 0.06 | 0.04 | 0.28 | <0.01 | 0.07 | 0.03 | 0.02 | 6.63 | 99.25 | 2.3882 |
| Tham.. | 5772 | 57.93 | 0.63 | 14.66 | 17.4 | 0.2 | 0.31 | 0.06 | 0.04 | 0.23 | <0.01 | 0.042 | 0.07 | 0.04 | 6.98 | 99.01 | 2.6086 |
| Error | ±2σ | 2.705 | 0.06 | 0.825 | 0.395 | 0.09 | 0.22 | 0.18 | 0.11 | 0.13 | 0.025 | 0.030 | 0.02 | 0.02 | 0.04 | 0.35 | 0.02 |

Errors are from 10 replicate analyses of the standard, CANMET SDMS2 (British Columbia granodioritic sand). Sample R5670 is whole rock, but R5670R is red band only and R5670W is white band only.

**Table S2**. Trace element chemical composition (ppm) from ICP-AES of selected samples.

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Spec. |  | La | Ce | Pr | Nd | Sm | Eu | Gd | Tb | Dy | Y | Ho | Er | Tm | Yb | Lu | Ba | Sr | Zr |
| R5676 |  | 63.3 | 121.5 | 13.3 | 47.1 | 8.27 | 1.21 | 5.09 | 0.66 | 3.18 | 16.2 | 0.69 | 2.31 | 0.36 | 3.13 | 0.48 | 128.5 | 543 | 255 |
| R5677 |  | 63.3 | 121 | 13.2 | 47.2 | 8.3 | 1.18 | 5.27 | 0.63 | 3.26 | 16.4 | 0.72 | 2.15 | 0.4 | 3.11 | 0.44 | 128.0 | 554 | 258 |
| R5678 |  | 62.7 | 119.5 | 13.1 | 47.5 | 8.34 | 1.15 | 5.06 | 0.64 | 3.31 | 16.4 | 0.71 | 2.35 | 0.4 | 3.18 | 0.47 | 126.5 | 558 | 257 |
| R5679 |  | 44.9 | 85.6 | 9.27 | 33.4 | 6.23 | 0.74 | 3.77 | 0.53 | 2.68 | 13.2 | 0.57 | 1.71 | 0.27 | 2.28 | 0.40 | 102.0 | 427 | 231 |
| ±2σ |  | 0.3 | 0.5 | 0.1 | 0.4 | 0.1 | 0.1 | 0.3 | 0.1 | 0.4 | 2.6 | 0.1 | 0.1 | 0.1 | 0.3 | 0.1 | 2.2 | 0.1 | 13.5 |

**Table S3.** Grain-size data by point counting thin sections (500 points) of selected samples

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Pedotype | Hoz | No. | % sand | % silt | % clay | Textural class | Gran fabric | Plasmic fabric |
| Wajing | A | R5668 | 2.2 | 47.6 | 50.0 | silty clay | intertextic | insepic |
| Wajing | Bg | R5669 | 4.0 | 58.4 | 37.6 | silty clay loam | intertextic | insepic |
| Wajing | Bg | R5670 | 2,4 | 66.6 | 31.0 | silty clay loam | intertextic | insepic |
| Wajing | C | R5671 | 6.4 | 63.4 | 30.2 | silty clay loam | intertextic | insepic |
| Wajing | A | R5672 | 5.8 | 73.4 | 20.8 | silt loam | intertextic | insepic |
| Wajing | Bg | R5673 | 6.8 | 80.0 | 13.2 | silt loam | intertextic | insepic |
| Wajing | Bg | R5674 | 11.8 | 69.4 | 18.8 | silt loam | intertextic | insepic |
| Wajing | C | R5675 | 18.2 | 68.2 | 13.6 | silt loam | granular | silasepic |
| Wajing | A | R5676 | 3.4 | 72.6 | 24.0 | silt loam | intertextic | insepic |
| Wajing | Bg | R5677 | 4.2 | 80.6 | 15.2 | silt loam | intertextic | insepic |
| Wajing | Bg | R5678 | 7.2 | 78.8 | 14.0 | silt loam | intertextic | insepic |
| Wajing | C | R5679 | 15.2 | 77.8 | 7.0 | silt loam | intertextic | insepic |
| Galadil | above | R5753 | 61.2 | 32.8 | 6.0 | sandy loam | intertextic | calciaspeic |
| Galadil | A | R5754 | 49.4 | 31.0 | 19.6 | loam | agglomeroplasmic | calciasepic |
| Galadil | Bk | R5755 | 57.6 | 24.6 | 17.8 | sandy loam | intertextic | calciasepic |
| Galadil | Bk | R5756 | 57.8 | 25.4 | 16.8 | sandy loam | intertextic | calciasepic |
| Galadil | C | R5757 | 62.4 | 27.8 | 9.8 | sandy loam | intertextic | calciasepic |
| Jilam | above | R5758 | 69.4 | 24.6 | 6.0 | sandy loam | granular | calciasepic |
| Jilam | A | R5759 | 60.0 | 29.2 | 10.8 | sandy loam | intertextic | calciasepic |
| Jilam | C | R5760 | 66.2 | 30.4 | 3.4 | sandy loam | intertextic | calciasepic |
| Galadil | above | R5761 | 60.6 | 30.8 | 8.6 | sandy loam | granular | calciasepic |
| Galadil | A | R5762 | 49.6 | 27.0 | 23.4 | sandy clay loam | agglomeroplasmic | insepic |
| Galadil | A | R5763 | 46.8 | 31.0 | 22.2 | loam | agglomeroplasmic | insepic |
| Galadil | Bk | R5764 | 55.4 | 31.8 | 12.8 | loam | granular | calciasepic |
| Galadil | Bk | R5765 | 47.8 | 36.6 | 15.6 | loam | granular | calciasepic |
| Galadil | C | R5766 | 60.0 | 33.2 | 6.8 | sandy loam | granular | calciasepic |
| Galadil | C | R5767 | 61.2 | 32.4 | 6.4 | sandy loam | granular | calciasepic |
| Thamberalg | above | R5768 | 13.8 | 80.8 | 5.4 | silt | imtertextic | silasepic |
| Thamberalg | A | R5769 | 3.2 | 71.6 | 25.2 | silt loam | agglomeroplasmic | mosepic |
| Thamberalg | By | R5770 | 2.2 | 79.6 | 18.2 | silt loam | intertextic | insepic |
| Thamberalg | By | R5771 | 20.6 | 60.2 | 19.2 | silt loam | intertextic | silasepic |
| Thamberalg | C | R5772 | 22.8 | 59.6 | 17.6 | silt loam | intertextic | isotic |
| Danggang | above | R5773 | 6.6 | 75.4 | 18.0 | silt loam | intertextic | argillasepic |
| Danggang | A | R5774 | 29.0 | 49.0 | 22.0 | loam | intertextic | insepic |
| Danggang | C | R5775 | 26.4 | 64.0 | 9.6 | silt loam | intertextic | silasepic |
| Danggang | C | R5776 | 23.0 | 68.8 | 8.2 | silt loam | intertextic | silasepic |

**Table S4.** Mineral content by point counting thin sections (500 points) of selected samples

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Pedotype | Hoz | No. | % clay | % dolomite | % rock | % feldspar | % mica | % quartz | % opaque |
| Wajing | A | R5668 | 49.4 | 0 | 1.0 | 19.0 | 2.4 | 9.2 | 16.8 |
| Wajing | Bg | R5669 | 37.8 | 0 | 1.4 | 26.8 | 2.4 | 18.0 | 13.6 |
| Wajing | Bg | R5670 | 29.8 | 0 | 3.4 | 28.8 | 2.8 | 20.2 | 15.0 |
| Wajing | C | R5671 | 31.6 | 0 | 3.8 | 34.6 | 3.4 | 24.4 | 2.2 |
| Wajing | A | R5672 | 21.0 | 0 | 4.2 | 29.6 | 27.4 | 16.0 | 0.8 |
| Wajing | Bg | R5673 | 12.6 | 0 | 2.6 | 35.0 | 22.2 | 22.8 | 4.8 |
| Wajing | Bg | R5674 | 19.2 | 0 | 3.0 | 30.4 | 19.6 | 22.4 | 5.2 |
| Wajing | C | R5675 | 12.8 | 0 | 3.2 | 37.6 | 16.8 | 28.6 | 1.0 |
| Wajing | A | R5676 | 23.2 | 0 | 1.8 | 30.0 | 12.4 | 25.8 | 6.8 |
| Wajing | Bg | R5677 | 15.0 | 0 | 2.0 | 31.8 | 27.0 | 19.6 | 4.6 |
| Wajing | Bg | R5678 | 14.6 | 0 | 2.0 | 31.6 | 28.0 | 21.0 | 2.8 |
| Wajing | C | R5679 | 6.0 | 0 | 3.8 | 37.6 | 25.6 | 23.8 | 3.2 |
| Galadil | above | R5753 | 5.8 | 16.0 | 4.6 | 37.2 | 0.6 | 33.6 | 2.2 |
| Galadil | A | R5754 | 19.2 | 12.2 | 4.8 | 29.8 | 0.8 | 31.2 | 2.0 |
| Galadil | Bk | R5755 | 19.0 | 6.2 | 6.4 | 34.2 | 1.6 | 29.4 | 3.2 |
| Galadil | Bk | R5756 | 16.0 | 18.2 | 4.2 | 29.6 | 0.6 | 26.8 | 4.6 |
| Galadil | C | R5757 | 10.8 | 11.6 | 3.8 | 35.6 | 1.4 | 33.2 | 3.6 |
| Jilam | above | R5758 | 5.6 | 18.6 | 4.4 | 34.2 | 0.4 | 35.4 | 1.4 |
| Jilam | A | R5759 | 12.6 | 12.0 | 5.0 | 31.8 | 0.6 | 35.8 | 2.2 |
| Jilam | C | R5760 | 3.0 | 24.4 | 4.8 | 32.0 | 0.6 | 32.0 | 3.2 |
| Galadil | above | R5761 | 13.0 | 14.6 | 6.2 | 31.0 | 2.2 | 29.8 | 3.2 |
| Galadil | A | R5762 | 23.0 | 4.6 | 6.0 | 30.4 | 0.4 | 31.8 | 3.8 |
| Galadil | A | R5763 | 24.4 | 10.2 | 5.4 | 29.2 | 0.6 | 26.6 | 3.6 |
| Galadil | Bk | R5764 | 14.4 | 16.4 | 4.6 | 30.4 | 1.0 | 30.0 | 3.2 |
| Galadil | Bk | R5765 | 16.8 | 14.2 | 6.6 | 29.2 | 1.4 | 28.4 | 3.4 |
| Galadil | C | R5766 | 7.0 | 17.0 | 7.8 | 33.0 | 1.2 | 31.2 | 2.8 |
| Galadil | C | R5767 | 7.2 | 14.0 | 6.8 | 34.4 | 1.0 | 34.0 | 2.6 |
| Thamberalg | above | R5768 | 3.8 | 0 | 2.2 | 45.6 | 36.4 | 10.6 | 1.4 |
| Thamberalg | A | R5769 | 26.2 | 0 | 2.8 | 36.6 | 12.2 | 17.6 | 4.6 |
| Thamberalg | By | R5770 | 18.2 | 0 | 1.2 | 40.0 | 17.6 | 20.8 | 2.2 |
| Thamberalg | By | R5771 | 17.8 | 0 | 5.2 | 38.0 | 10.0 | 26.6 | 2.4 |
| Thamberalg | C | R5772 | 18.6 | 0 | 4.4 | 37.0 | 10.8 | 27.6 | 1.6 |
| Danggang | above | R5773 | 18.2 | 0 | 1.6 | 31.2 | 24.4 | 19.2 | 5.2 |
| Danggang | A | R5774 | 22.8 | 0 | 4.0 | 34.0 | 18.0 | 20.2 | 1.0 |
| Danggang | C | R5775 | 10.0 | 0 | 3.8 | 38.0 | 21.6 | 24.0 | 2.6 |
| Danggang | C | R5776 | 8.4 | 0 | 5.0 | 36.8 | 36.8 | 27.8 | 4.0 |