**FIGURES**

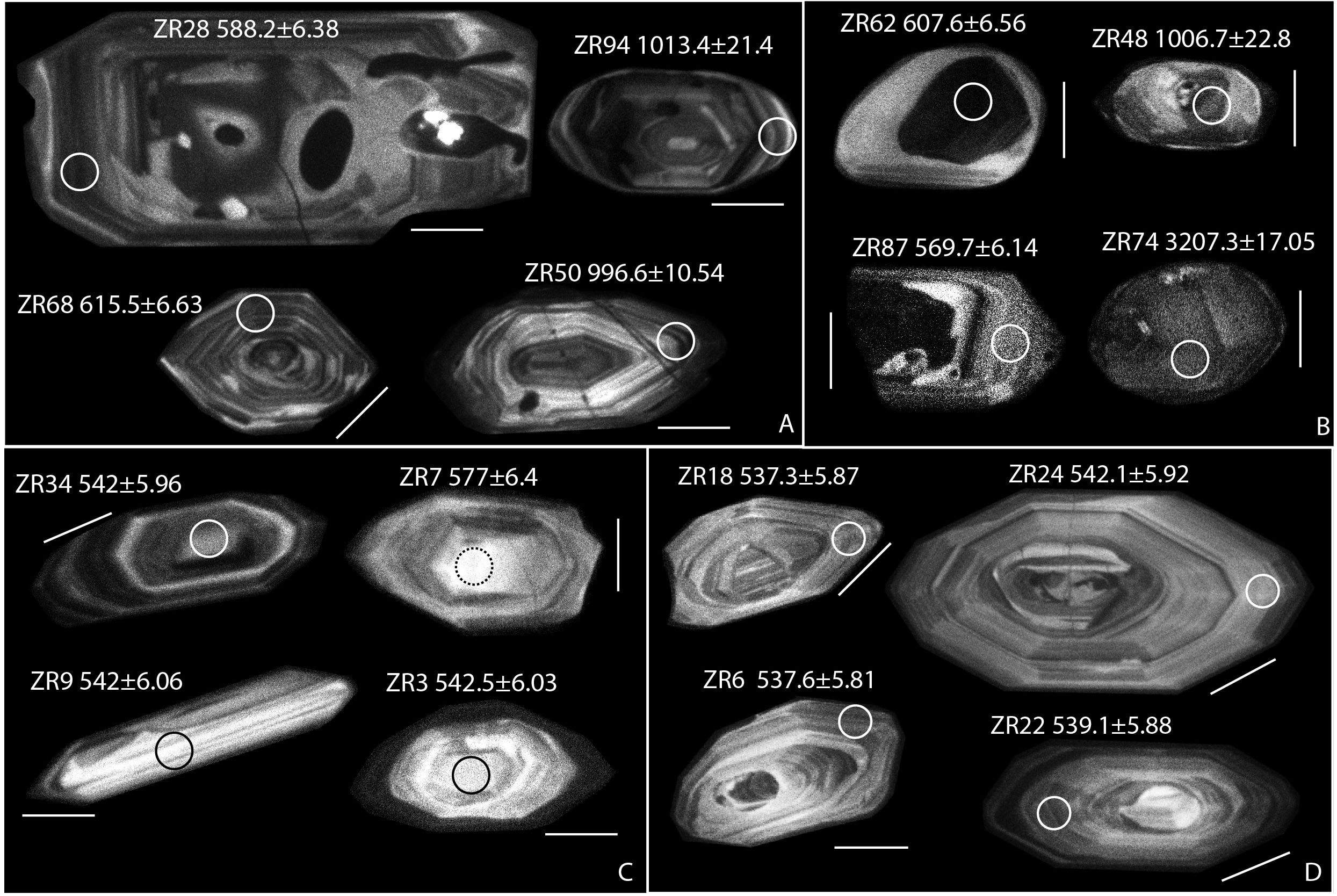


Fig. S1. Example of CL-imaging for analyzed zircon. A: sample MN1, B: sample MN4, C: sample MN2, D: sample MN3. Scale bars are 50 µm. Zircon numbers (ZRxx) and dates are in supplementary tables.

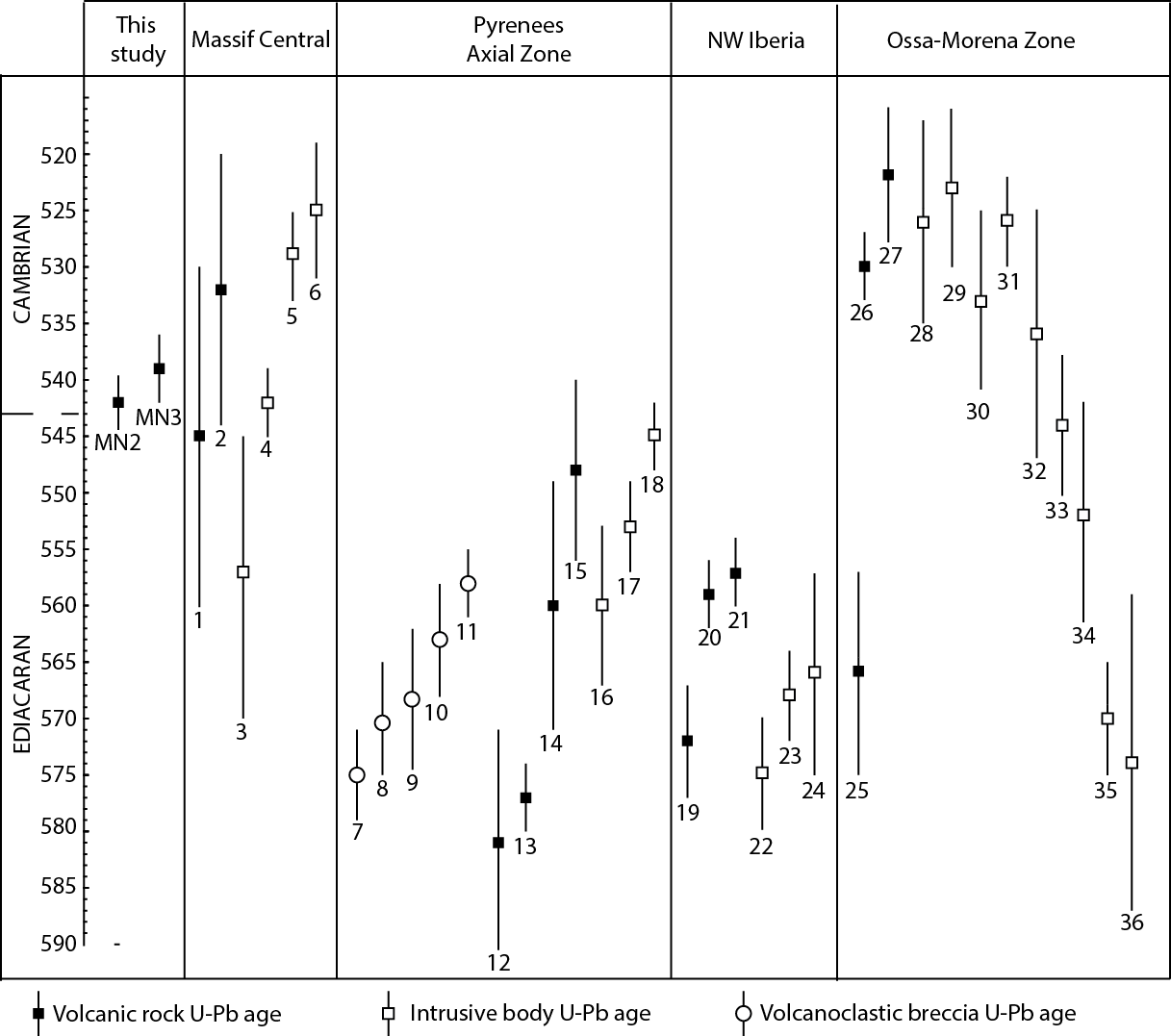


Fig. S2. Rivernous Fm U–Pb ages, **MN2 and MN3**, compared with regional magmatic ages in the Massif Central and Pyrenean massifs and in the Iberian domain across the Ediacaran–Cambrian transition. **Massif Central** : 1 – Sériès metadacite, 545±15 Ma(1); 2 – Murat Fm, 532±12 Ma(2) ; 3 - Caplongue granodiorite, 557±12 Ma (3); 4 – Arc-de-Fix and Ardéchois augen 541.8 ± 3.1 and 542.5 ± 3.1 Ma (4); 5 – Li14, Moulin du Chambon orthogneiss, 529±4Ma(3); 6 – Vergonzac orthogneiss, 525±6 Ma(3). **Pyrenees Axial Zone** : 7 – TG03, Tregurà volcanoclastic breccia, 575±4 Ma(5); 8 – TG01, Tregurà volcanoclastic breccia, 570±5 Ma(5); 9 - TG02, Tregurà volcanoclastic breccia, 568±6 Ma(5); 10 – CC0807, Cap de Creus volcanoclastic breccia 563±5 Ma(5); 11 – CC0808, Cap de Creus volcanoclastic breccia, 558±3Ma(5) ; 12 – GRA1, Mas des Sitges metarhyolithic tuff, 581±10 Ma(6); 13 – CC0801, 577±3 Ma(5); 14 – CC0502, Cap de Creus metatuff 560±11 Ma(7); 15 – RF3 Mas Blanc metarhyolithic tuff, 548±8 Ma(7); 16 – RF4, Mas Blanc gneiss, 560±7Ma(7); 17 – CC0507, Port gneiss 553±4 Ma(6); 18 – LOG, Laparan gneiss, 545±3 Ma(8). **NW Iberia**: 19 – PEN552, Allande group dacitic tuff, 572±5 Ma (9) ; 20 – NWIb, 559±3 Ma(10); 21 – CQ39 Cudillero rhyolite, 557±2.7 Ma(9) ; 22 – PEN151, Escrita diorite, 575±5 Ma(9) ; 23 – Lomes tonalite, 568±4 Ma(9) ; 24 – La Cueta granodiorite, 566±9 Ma(9). **Ossa-Morena Zone** : 25 – La Cardenchosilla amphibolite, 566±9 Ma(11); 26 – Bodonal porphyroid, 530±3 Ma(11); 27 – Escoural felsic gneiss, 522±5 Ma(11); 27 - Alcaçovas felsic gneiss, 526±9 Ma(11); 29 – Mina afortunada granitoids and migmatites, 523±7 Ma(11); 30 – Monestério granitoids and migmatites, 533±8 Ma(11); 31 –Barquete granite, 526±4 Ma(11); 32 – Monteagudo gabbro, 536±11 Ma(11); 33 – Mosquil tonalite 544±6 Ma(11); 34 – Ahillones granite, 552±10 Ma(11) ; 35 – Mouriscas gneiss, 570±5 Ma(11) ; 36 – Vale de Serena-Zalamea granodiorite, 573±14 Ma(11). **Reference numbers**: (1) Lescuyer and Cocherie 1992 ; (2) Ducrot et al., in Demange et al., 1995 ; (3) Melleton et al., 2010 and therein references ; (4) Couzinié et al., this issue ; (5) Casas et al., 2015 ; (6) Cocherie et al., 2005 ; (7) Castiñeiras et al., 2008 ; (8) Mezgher et al., 2016 ; (9) Rubio-Ordoñez et al., 2015 ; (10) Gutiérrez-Alonso et al., 2004 ; (11) Pereira et al., 2011 and references therein.

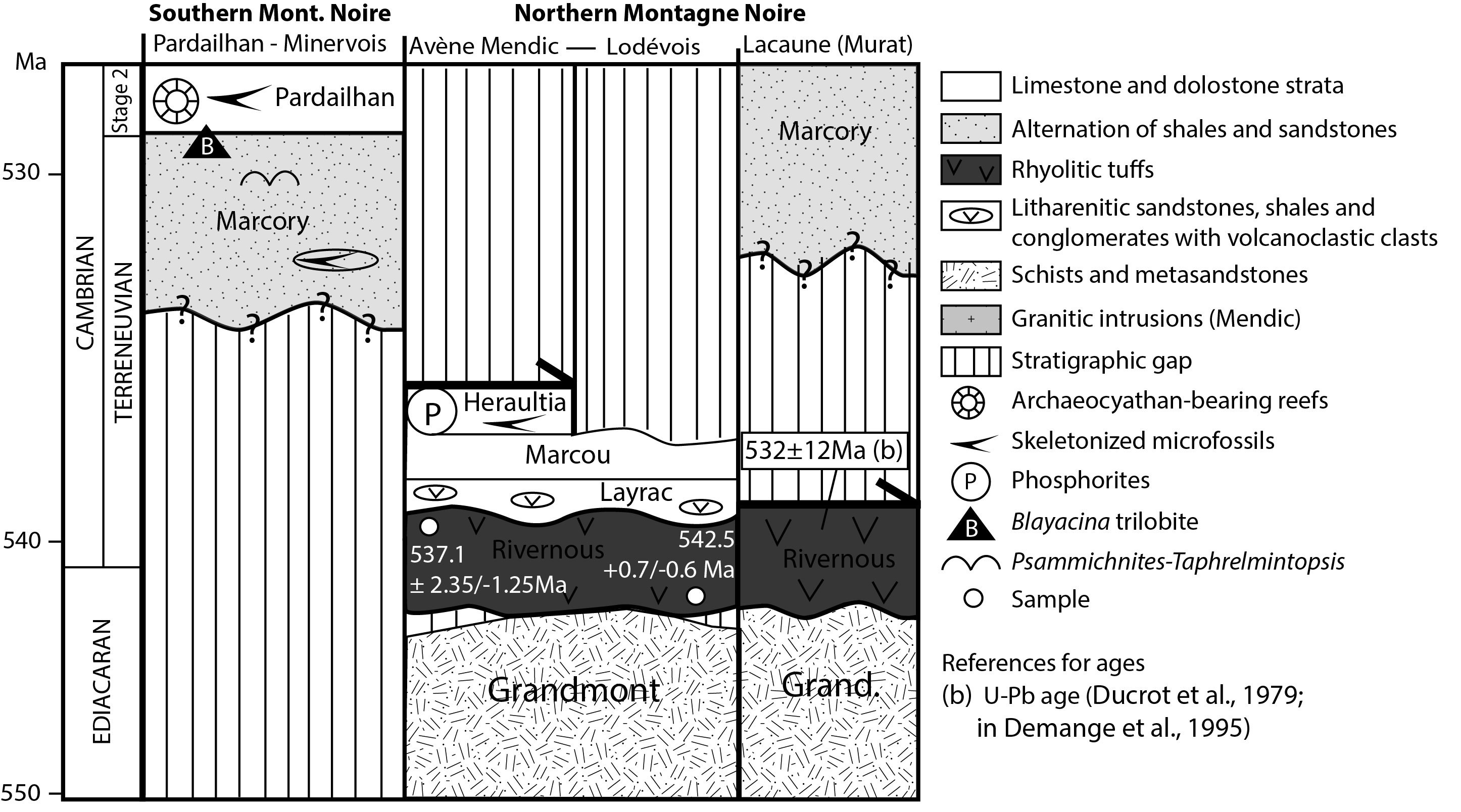


Fig. S3. Updated stratigraphy of the Ediacaran–Cambrian transition in the Montagne Noire with new U–Pb ages.