

Supplement of Geochronology, 2, 17–31, 2020  
<https://doi.org/10.5194/gchron-2-17-2020-supplement>  
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*Supplement of*

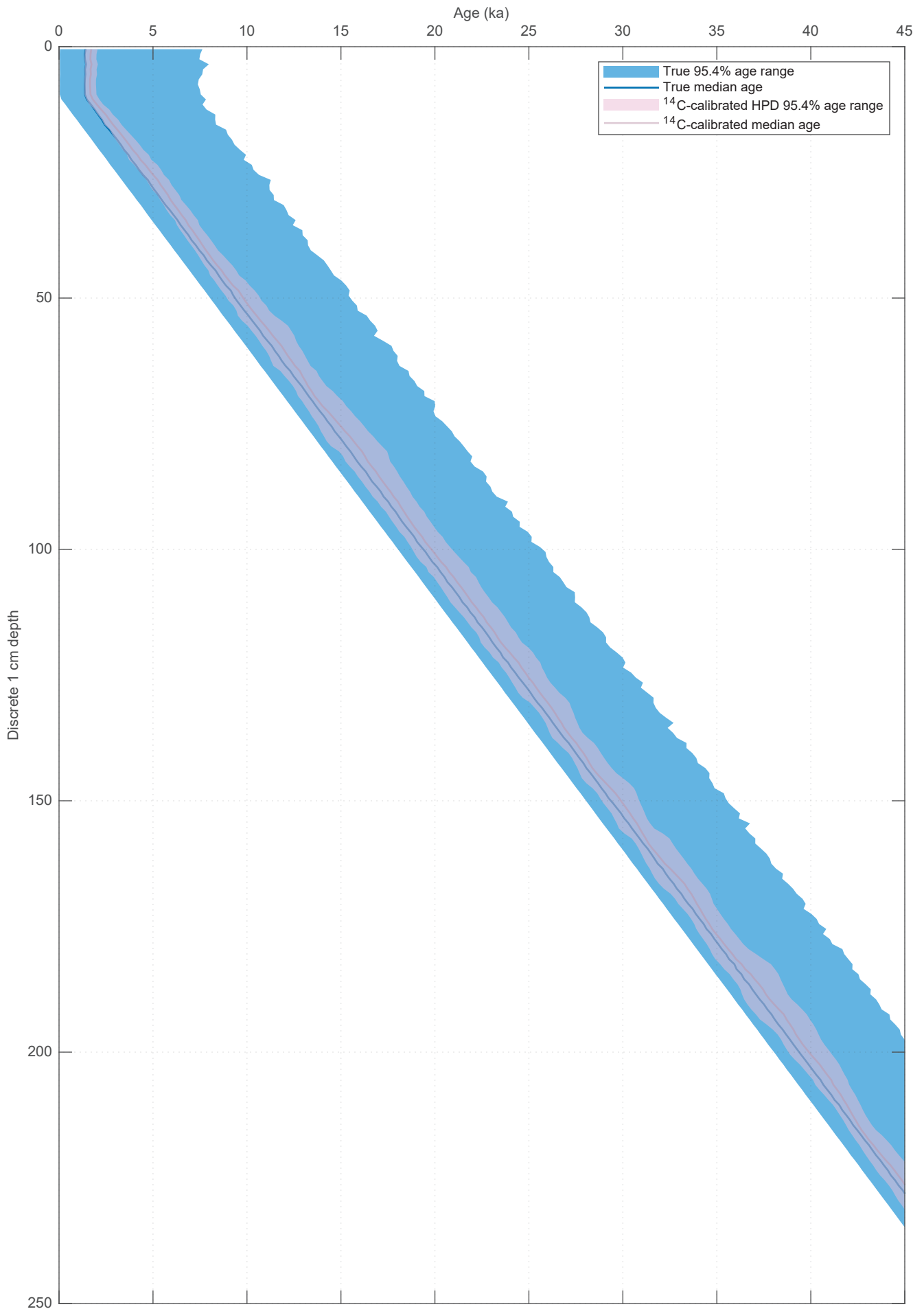
## **Re-evaluating $^{14}\text{C}$ dating accuracy in deep-sea sediment archives**

**Bryan C. Lougheed et al.**

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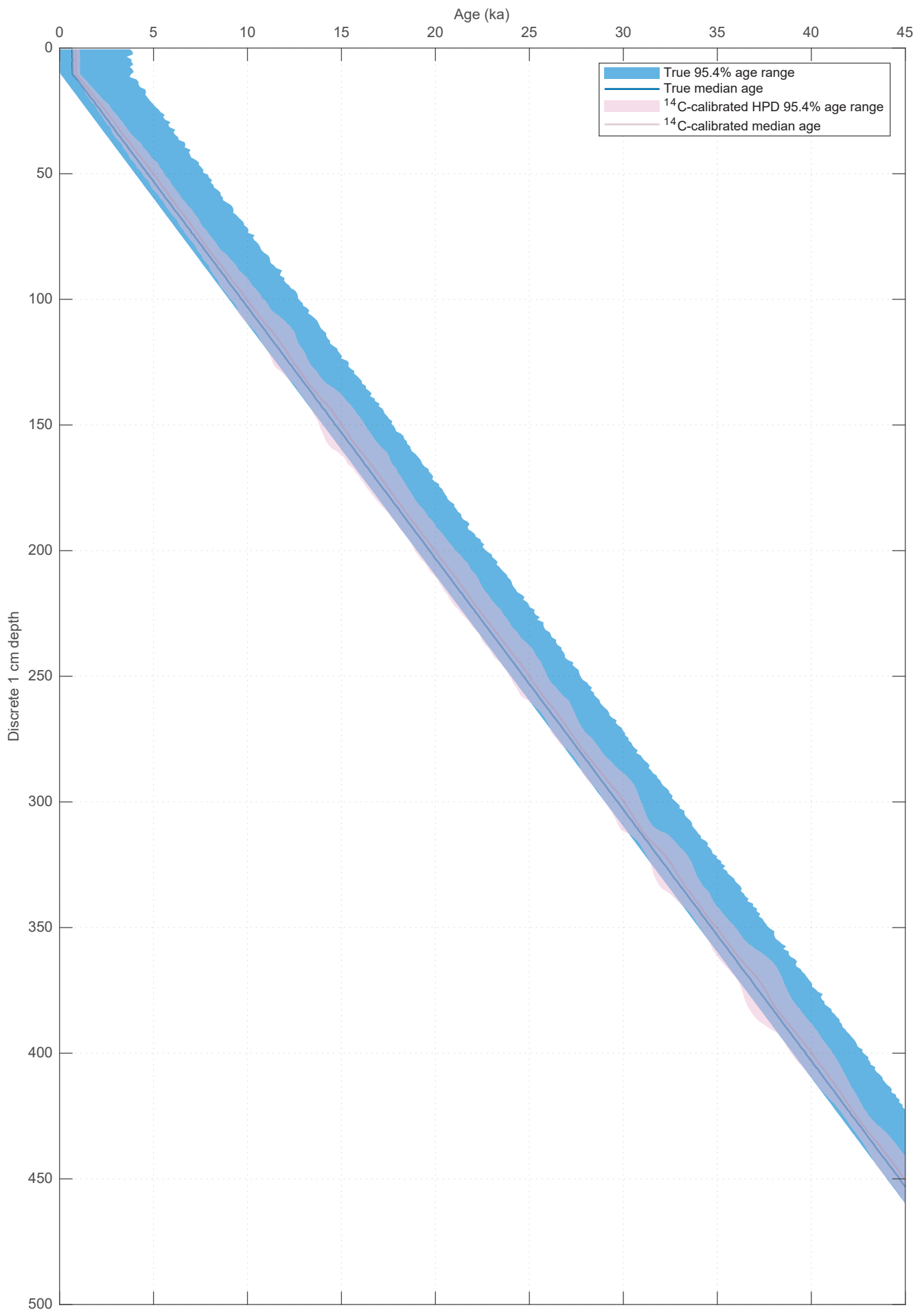
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Constant SAR of 5 cm kyr<sup>-1</sup> with Marine13  $\Delta^{14}\text{C}$ ,  
constant BD of 10 cm, constant abundance of 100% and 0% broken foraminifera



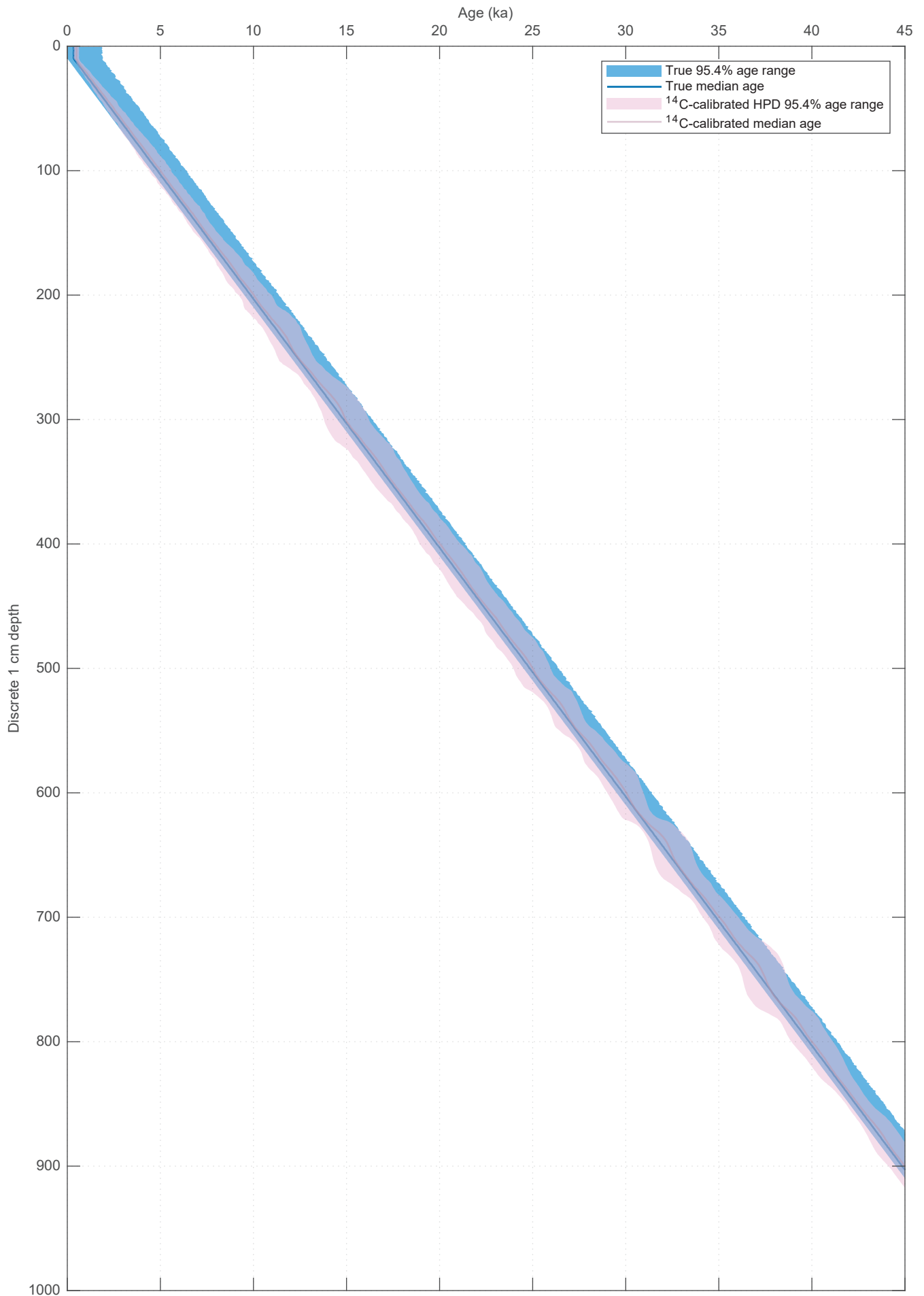
**Figure S1.** Simulated 1 cm discrete-depth 95.4% true age range (light blue), true median age (dark blue), <sup>14</sup>C-calibrated 95.4% HPD age range (light pink) and <sup>14</sup>C-calibrated median age (dark pink) for whole foraminifera in a simulation scenario with a constant SAR of 5 cm kyr<sup>-1</sup>, constant BD of 10 cm and 0% broken foraminifera.

Constant SAR of 10 cm kyr<sup>-1</sup> with Marine13  $\Delta^{14}\text{C}$ ,  
constant BD of 10 cm, constant abundance of 100% and 0% broken foraminifera



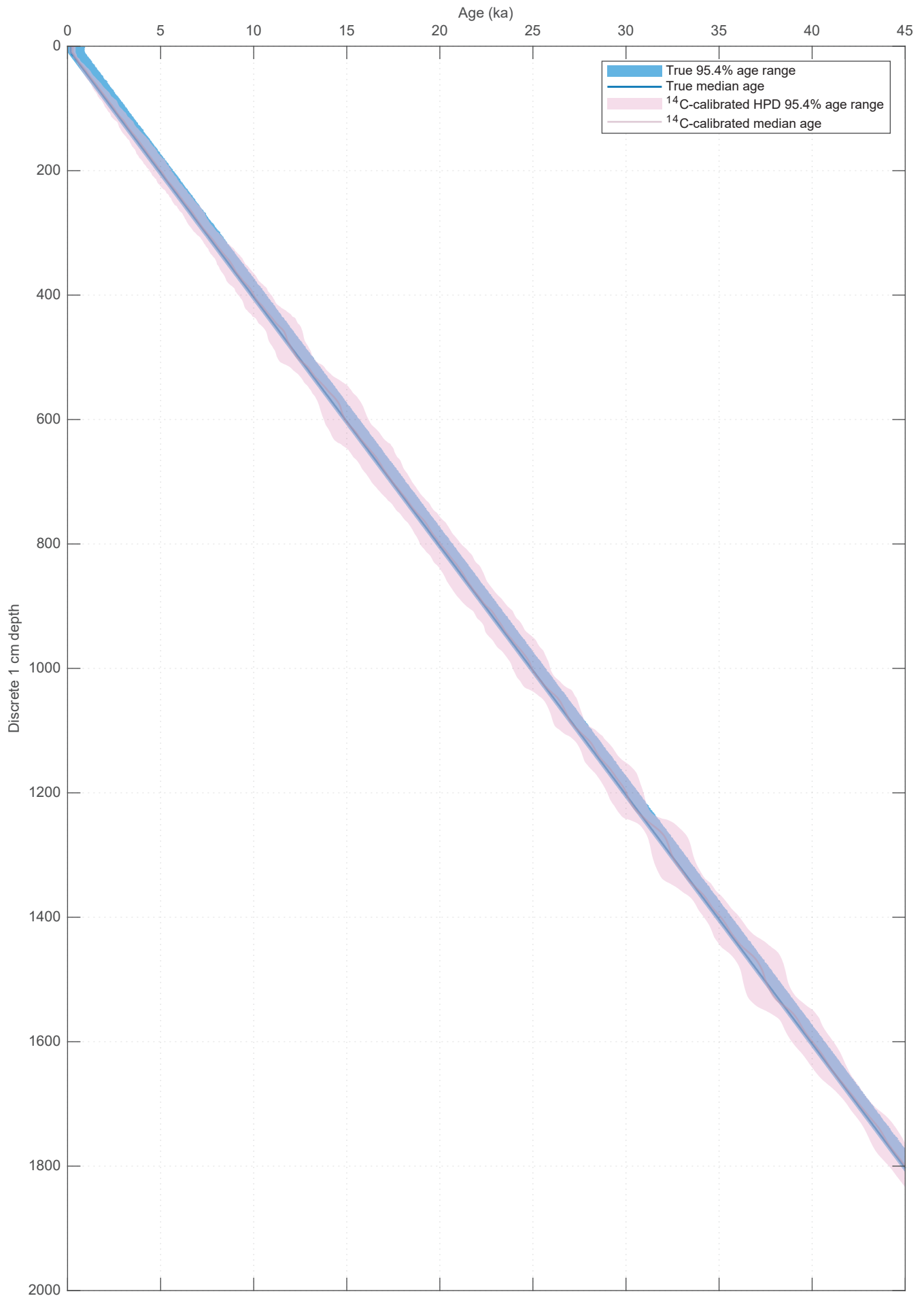
**Figure S2.** Simulated 1 cm discrete-depth 95.4% true age range (light blue), true median age (dark blue), <sup>14</sup>C-calibrated 95.4% HPD age range (light pink) and <sup>14</sup>C-calibrated median age (dark pink) for whole foraminifera in a simulation scenario with a constant SAR of 10 cm kyr<sup>-1</sup>, constant BD of 10 cm and 0% broken foraminifera.

Constant SAR of 20 cm kyr<sup>-1</sup> with Marine13  $\Delta^{14}\text{C}$ ,  
constant BD of 10 cm, constant abundance of 100% and 0% broken foraminifera



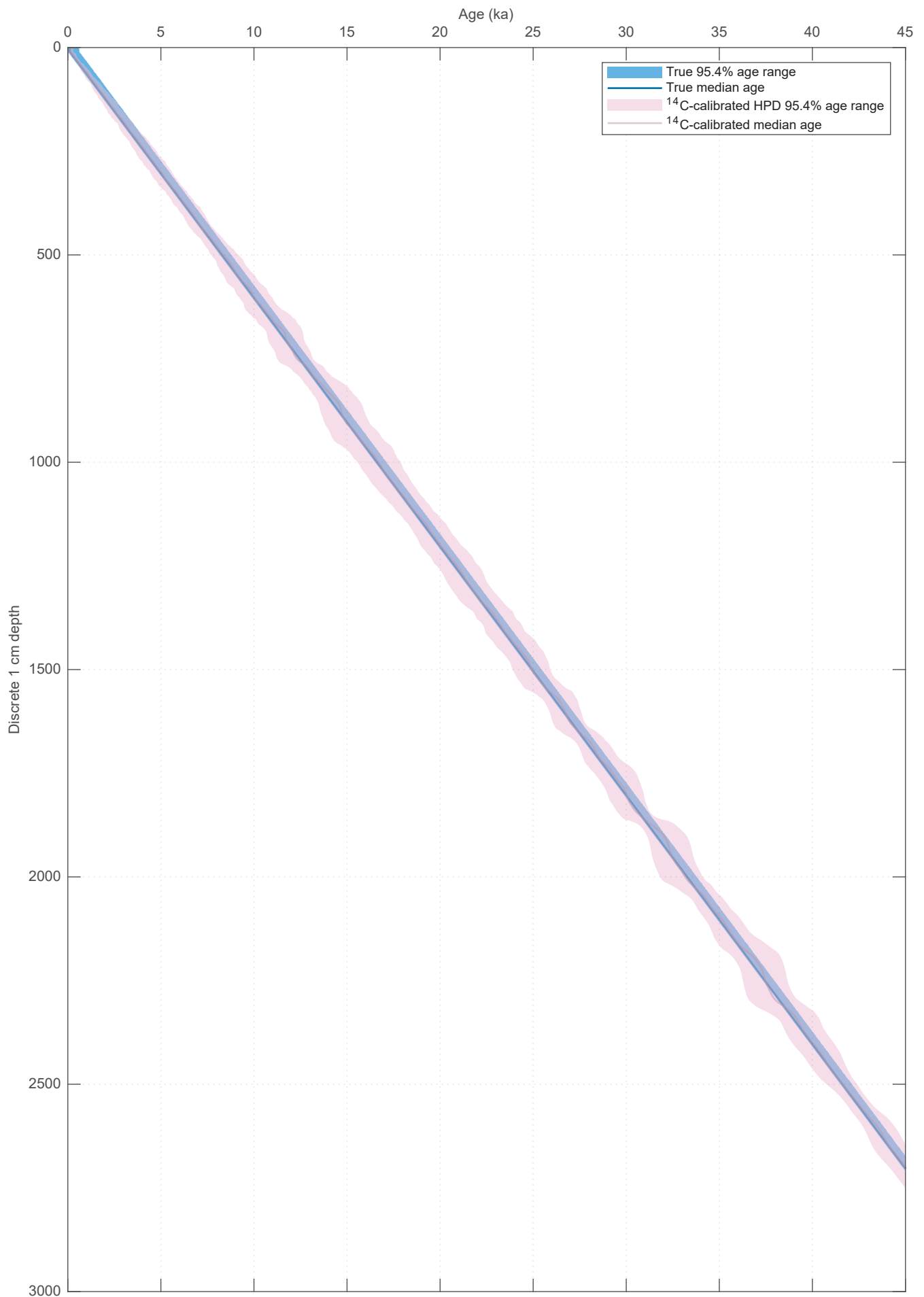
**Figure S3.** Simulated 1 cm discrete-depth 95.4% true age range (light blue), true median age (dark blue), <sup>14</sup>C-calibrated 95.4% HPD age range (light pink) and <sup>14</sup>C-calibrated median age (dark pink) for whole foraminifera in a simulation scenario with a constant SAR of 20 cm kyr<sup>-1</sup>, constant BD of 10 cm and 0% broken foraminifera.

Constant SAR of 40 cm kyr<sup>-1</sup> with Marine13  $\Delta^{14}\text{C}$ ,  
constant BD of 10 cm, constant abundance of 100% and 0% broken foraminifera



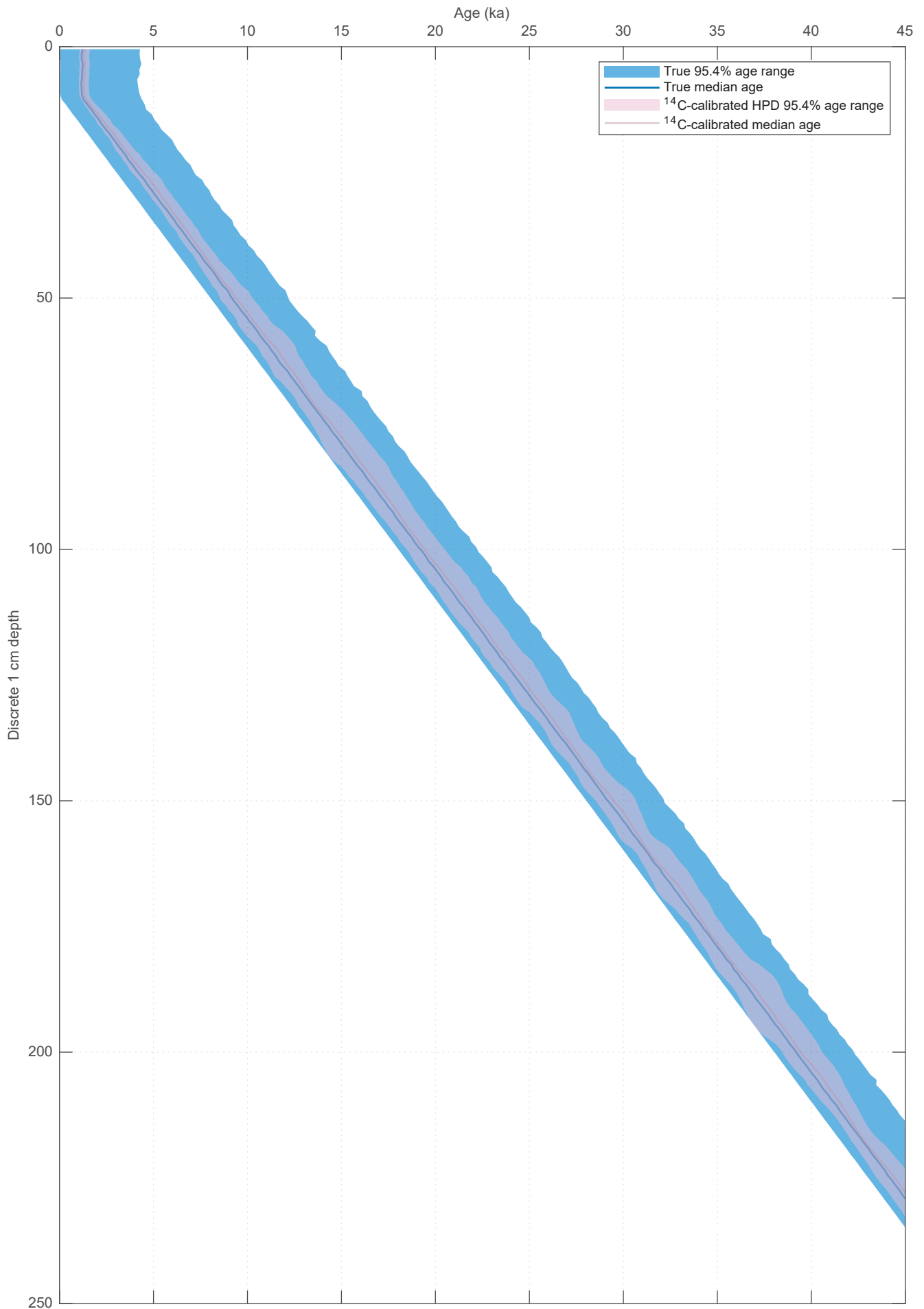
**Figure S4.** Simulated 1 cm discrete-depth 95.4% true age range (light blue), true median age (dark blue), <sup>14</sup>C-calibrated 95.4% HPD age range (light pink) and <sup>14</sup>C-calibrated median age (dark pink) for whole foraminifera in a simulation scenario with a constant SAR of 40 cm kyr<sup>-1</sup>, constant BD of 10 cm and 0% broken foraminifera.

Constant SAR of 60 cm kyr<sup>-1</sup> with Marine13  $\Delta^{14}\text{C}$ ,  
constant BD of 10 cm, constant abundance of 100% and 0% broken foraminifera



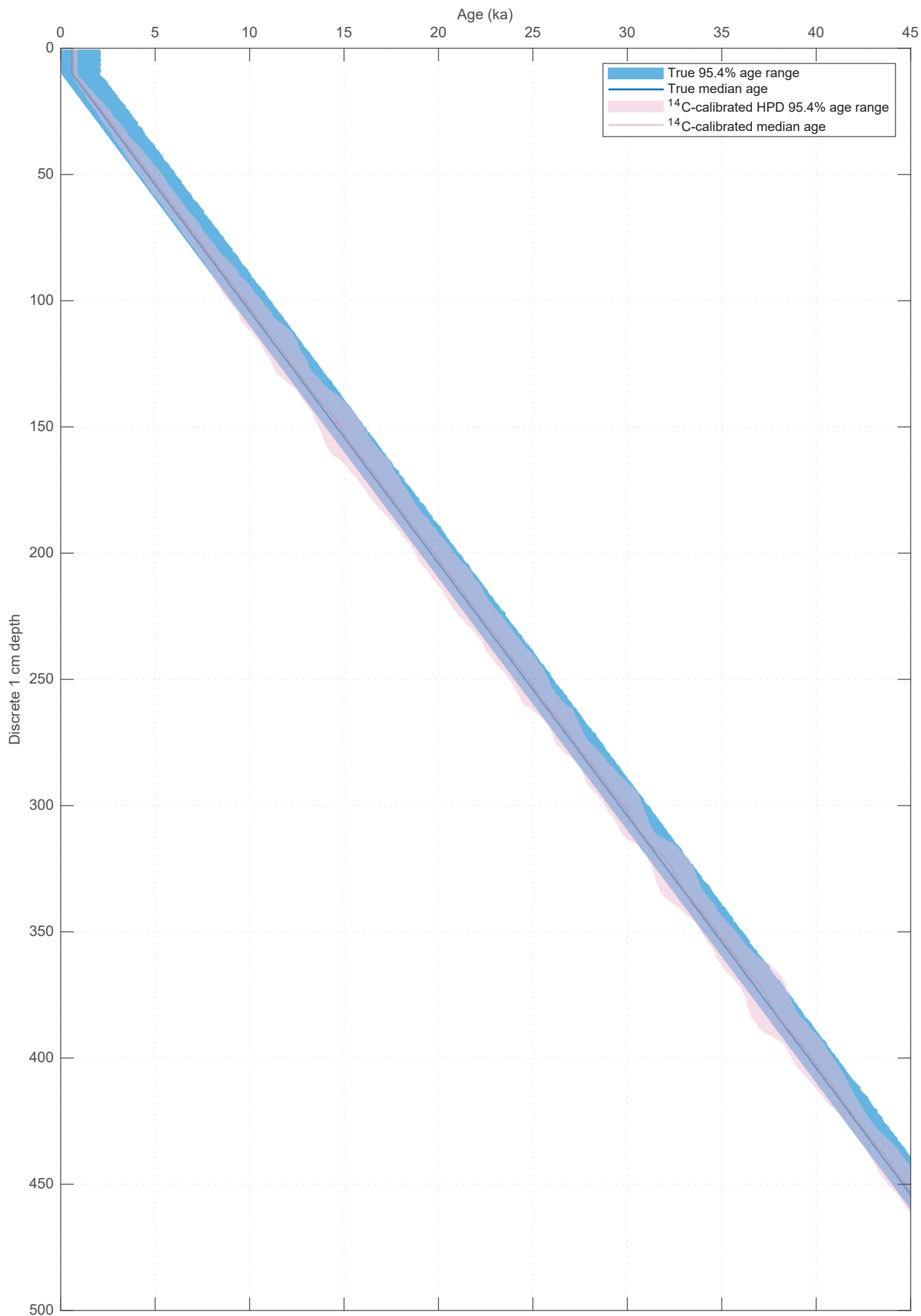
**Figure S5.** Simulated 1 cm discrete-depth 95.4% true age range (light blue), true median age (dark blue), <sup>14</sup>C-calibrated 95.4% HPD age range (light pink) and <sup>14</sup>C-calibrated median age (dark pink) for whole foraminifera in a simulation scenario with a constant SAR of 60 cm kyr<sup>-1</sup>, constant BD of 10 cm and 0% broken foraminifera.

Constant SAR of 5 cm kyr<sup>-1</sup> with Marine13  $\Delta^{14}\text{C}$ ,  
constant BD of 10 cm, constant abundance of 100% and 10% broken foraminifera



**Figure S6.** Simulated 1 cm discrete-depth 95.4% true age range (light blue), true median age (dark blue), <sup>14</sup>C-calibrated 95.4% HPD age range (light pink) and <sup>14</sup>C-calibrated median age (dark pink) for whole foraminifera in a simulation scenario with a constant SAR of 5 cm kyr<sup>-1</sup>, constant BD of 10 cm and 10% broken foraminifera.

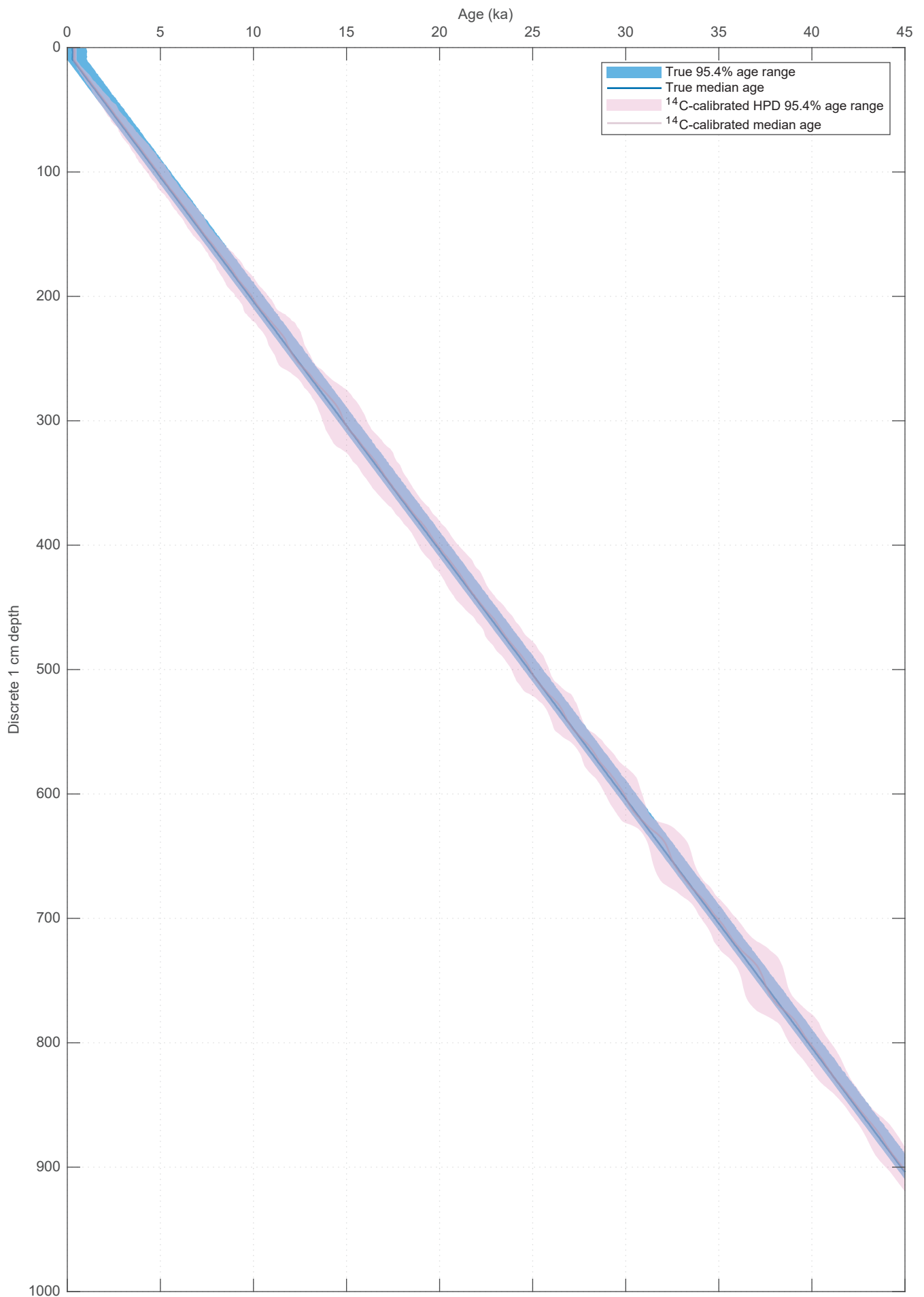
Constant SAR of 10 cm kyr<sup>-1</sup> with Marine13  $\Delta^{14}\text{C}$ ,  
constant BD of 10 cm, constant abundance of 100% and 10% broken foraminifera



**Figure S7.** Simulated 1 cm discrete-depth 95.4% true age range (light blue), true median age (dark blue), <sup>14</sup>C-calibrated 95.4% HPD age range (light pink) and <sup>14</sup>C-calibrated median age (dark pink) for whole foraminifera in a simulation scenario with a constant SAR of 10 cm kyr<sup>-1</sup>, constant BD of 10 cm and 10% broken foraminifera.

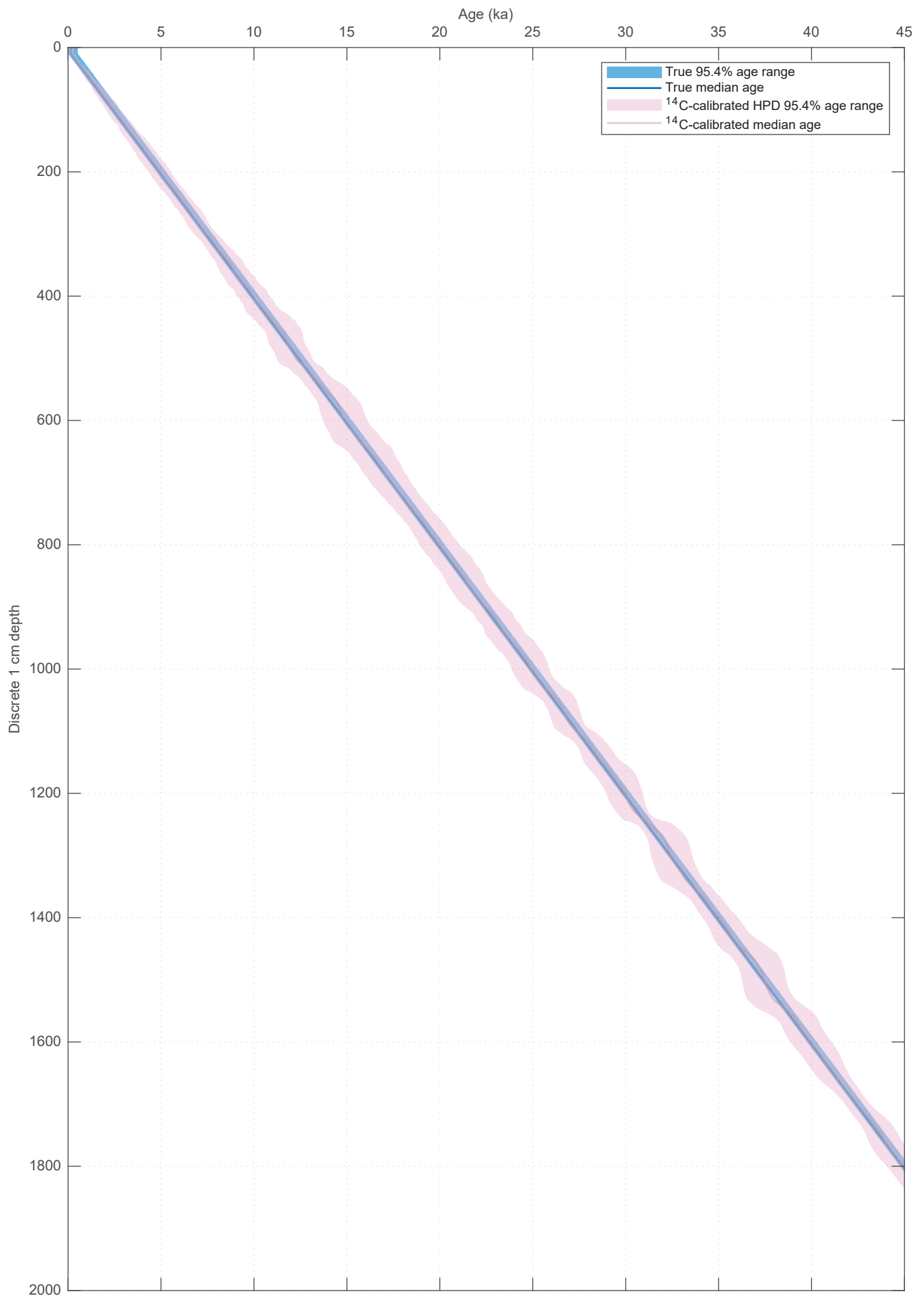


Constant SAR of 20 cm kyr<sup>-1</sup> with Marine13  $\Delta^{14}\text{C}$ ,  
constant BD of 10 cm, constant abundance of 100% and 10% broken foraminifera



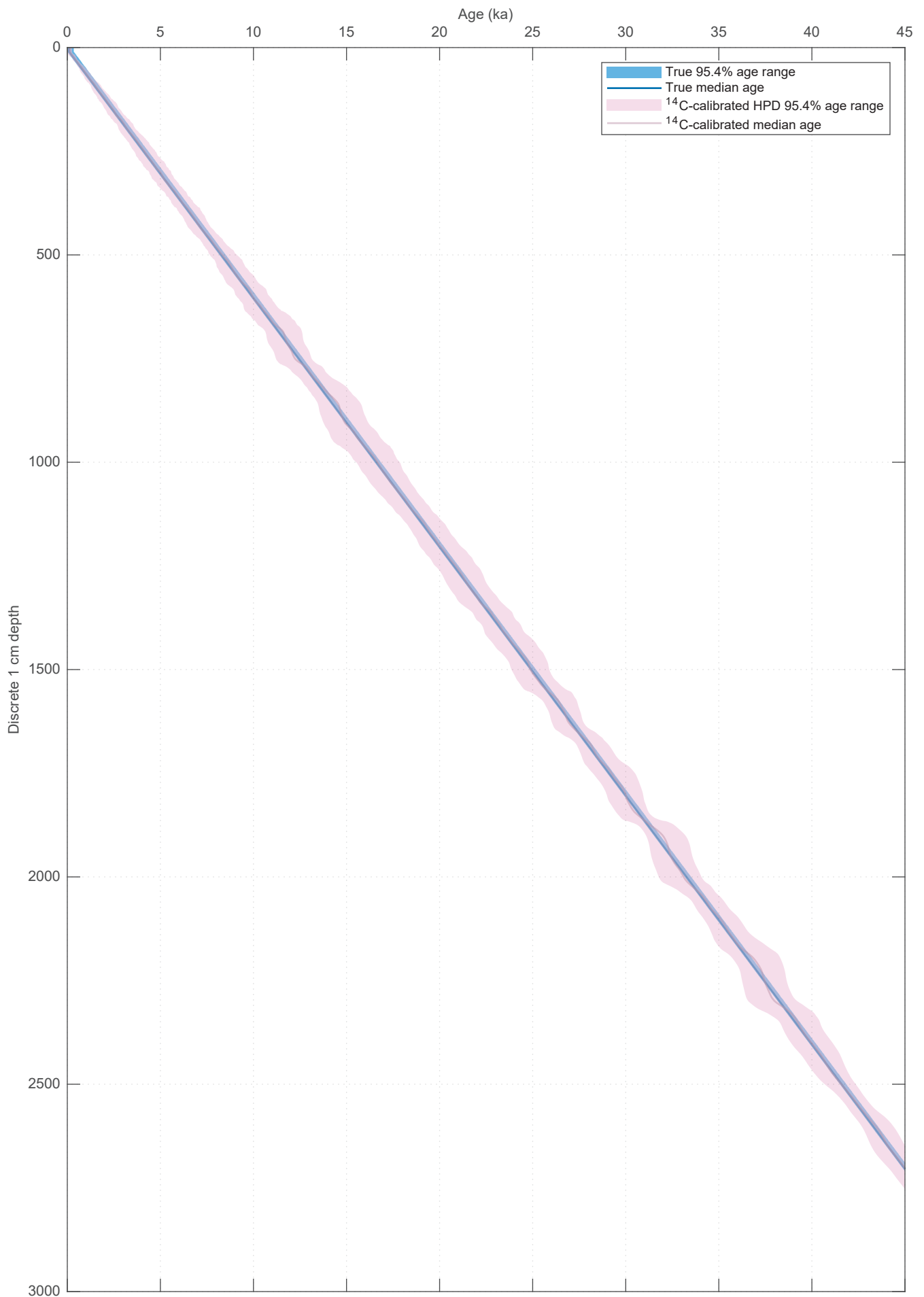
**Figure S8.** Simulated 1 cm discrete-depth 95.4% true age range (light blue), true median age (dark blue), <sup>14</sup>C-calibrated 95.4% HPD age range (light pink) and <sup>14</sup>C-calibrated median age (dark pink) for whole foraminifera in a simulation scenario with a constant SAR of 20 cm kyr<sup>-1</sup>, constant BD of 10 cm and 10% broken foraminifera.

Constant SAR of 40 cm kyr<sup>-1</sup> with Marine13  $\Delta^{14}\text{C}$ ,  
constant BD of 10 cm, constant abundance of 100% and 10% broken foraminifera



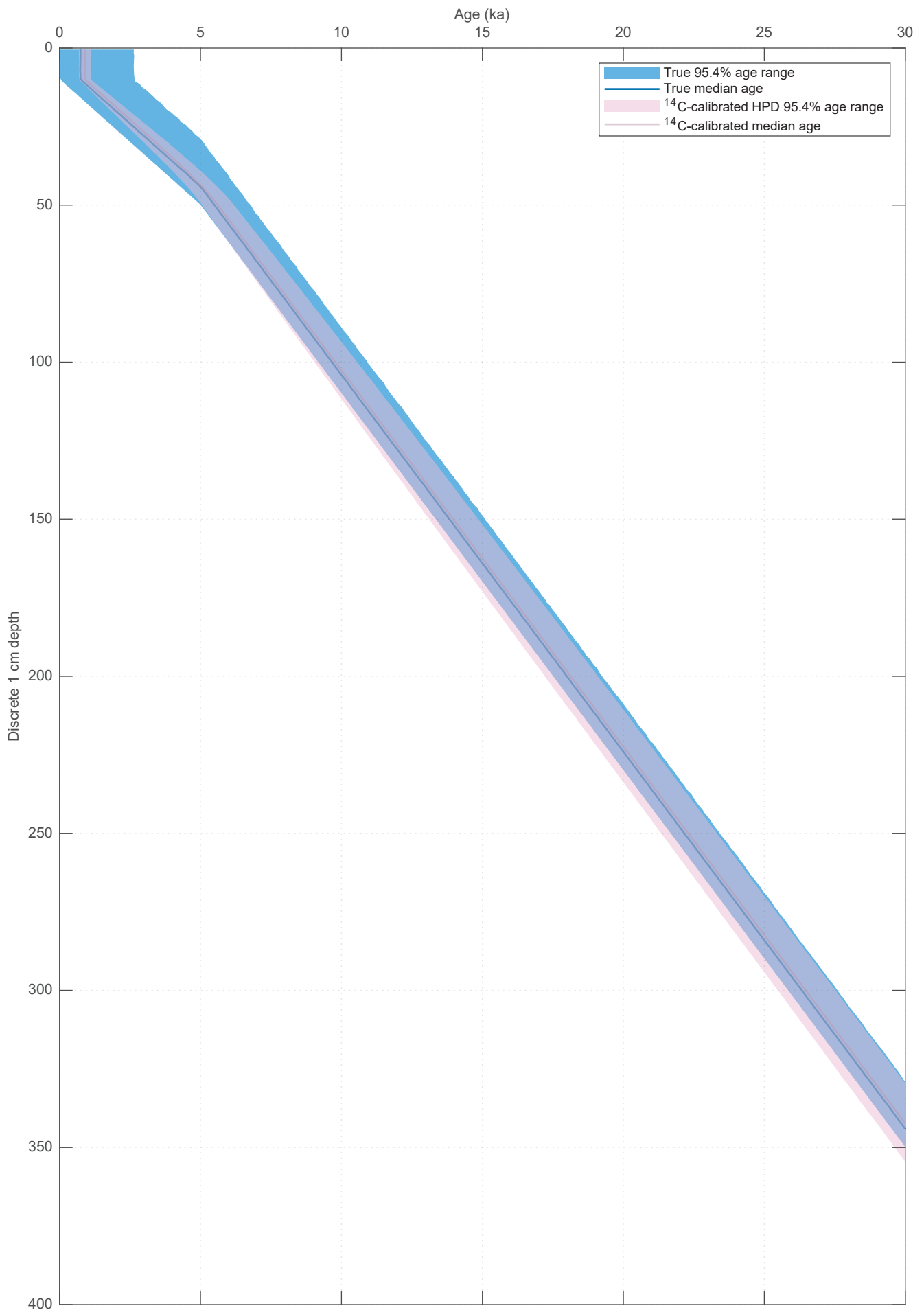
**Figure S9.** Simulated 1 cm discrete-depth 95.4% true age range (light blue), true median age (dark blue), <sup>14</sup>C-calibrated 95.4% HPD age range (light pink) and <sup>14</sup>C-calibrated median age (dark pink) for whole foraminifera in a simulation with a constant SAR of 40 cm kyr<sup>-1</sup>, constant BD of 10 cm and 10% broken foraminifera.

Constant SAR of 60 cm kyr<sup>-1</sup> with Marine13  $\Delta^{14}\text{C}$ ,  
constant BD of 10 cm, constant abundance of 100% and 10% broken foraminifera



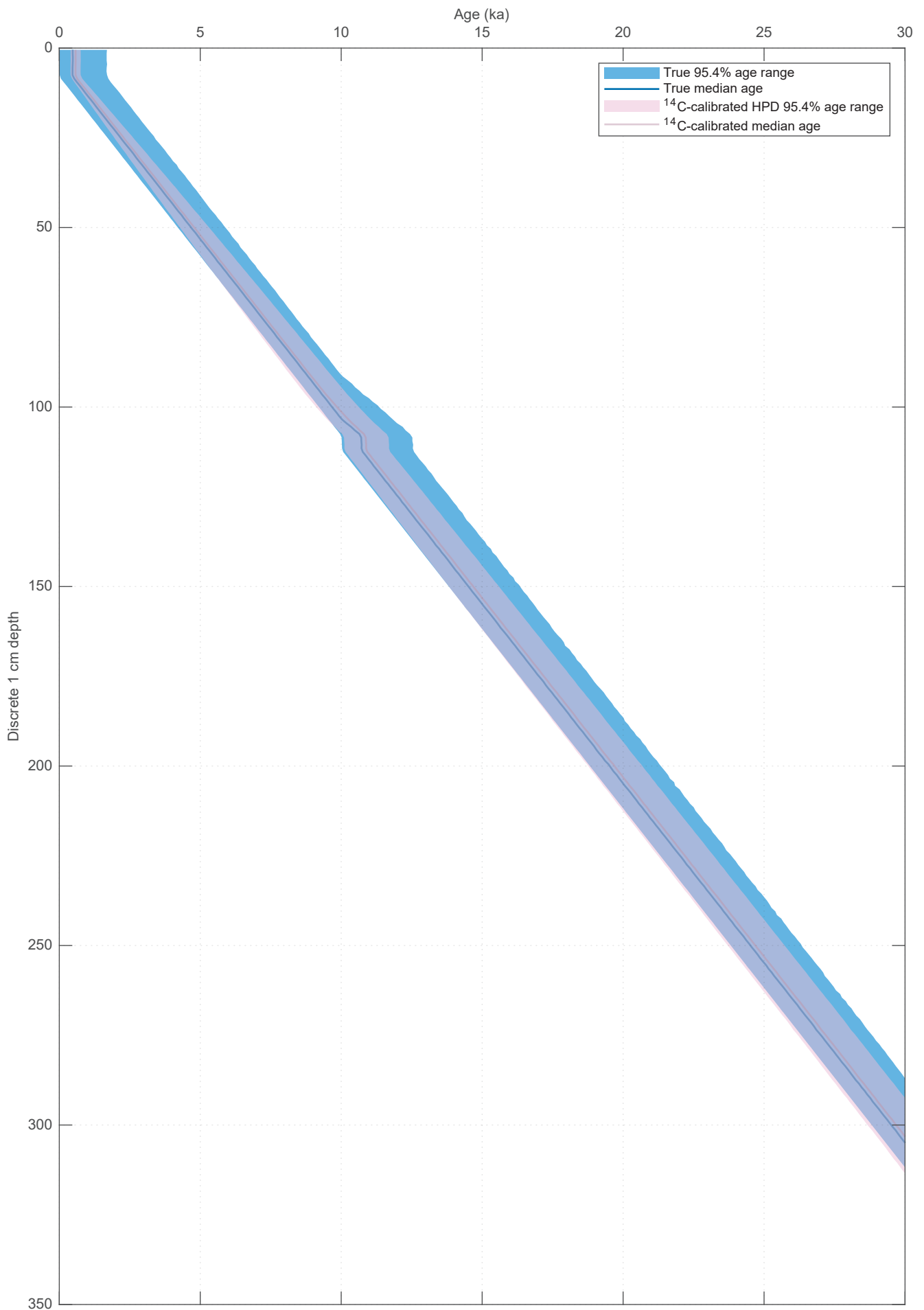
**Figure S10.** Simulated 1 cm discrete-depth 95.4% true age range (light blue), true median age (dark blue), <sup>14</sup>C-calibrated 95.4% HPD age range (light pink) and <sup>14</sup>C-calibrated median age (dark pink) for whole foraminifera in a simulation scenario with a constant SAR of 60 cm kyr<sup>-1</sup>, constant BD of 10 cm and 10% broken foraminifera.

Dynamic SAR (Fig. 5a) with constant  $\Delta^{14}\text{C}$ , constant BD,  
constant abundance and constant  $\Delta R$



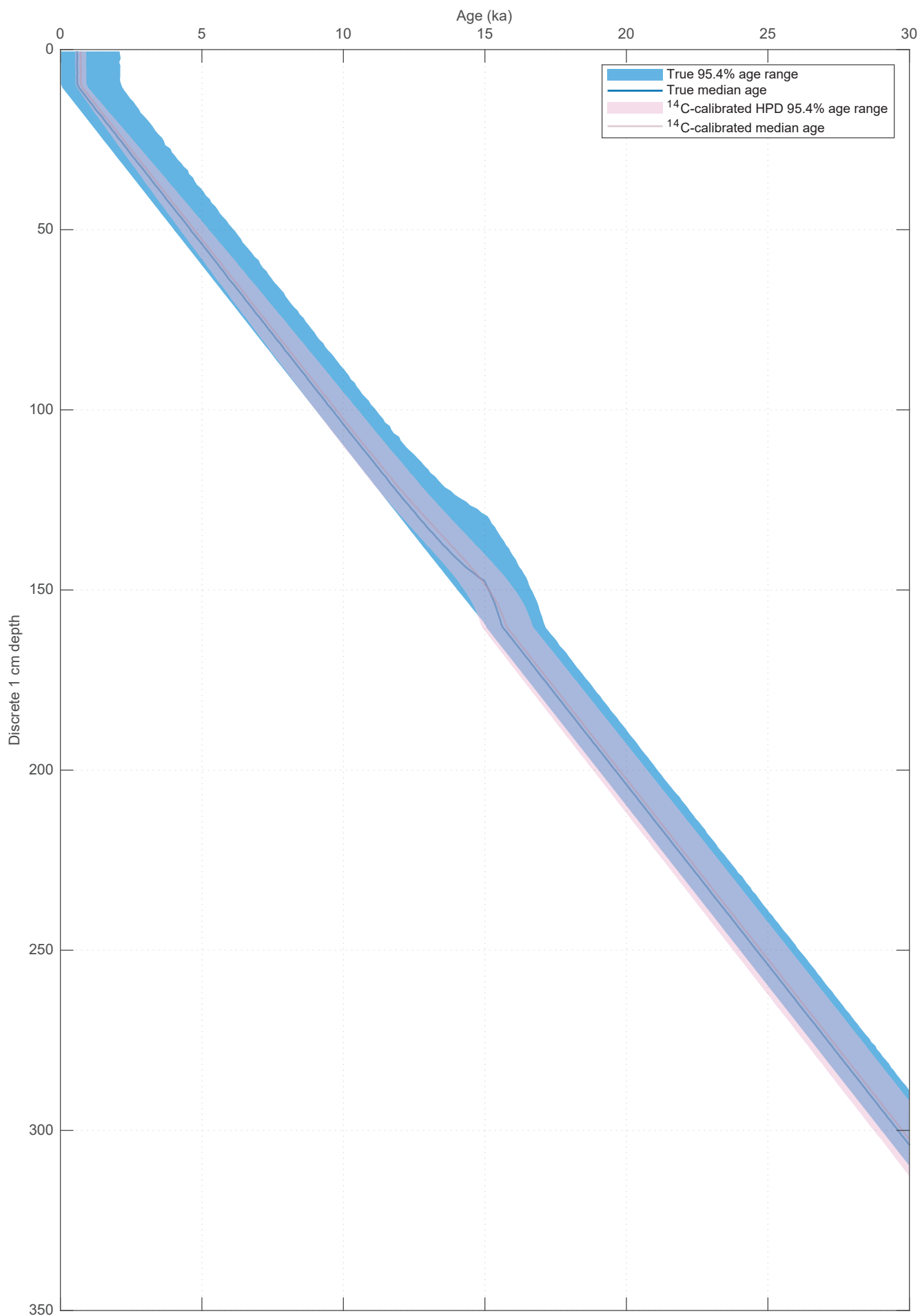
**Figure S11.** Simulated 1 cm discrete-depth 95.4% true age range (light blue), true median age (dark blue),  $^{14}\text{C}$ -calibrated 95.4% HPD age range (light pink) and  $^{14}\text{C}$ -calibrated median age (dark pink) for the scenario using constant  $\Delta^{14}\text{C}$  and dynamic SAR as detailed in Fig. 5 (blue lines in Fig. 5).

Dynamic BD (Fig. 5b) with constant  $\Delta^{14}\text{C}$ , constant SAR,  
constant abundance and constant  $\Delta R$



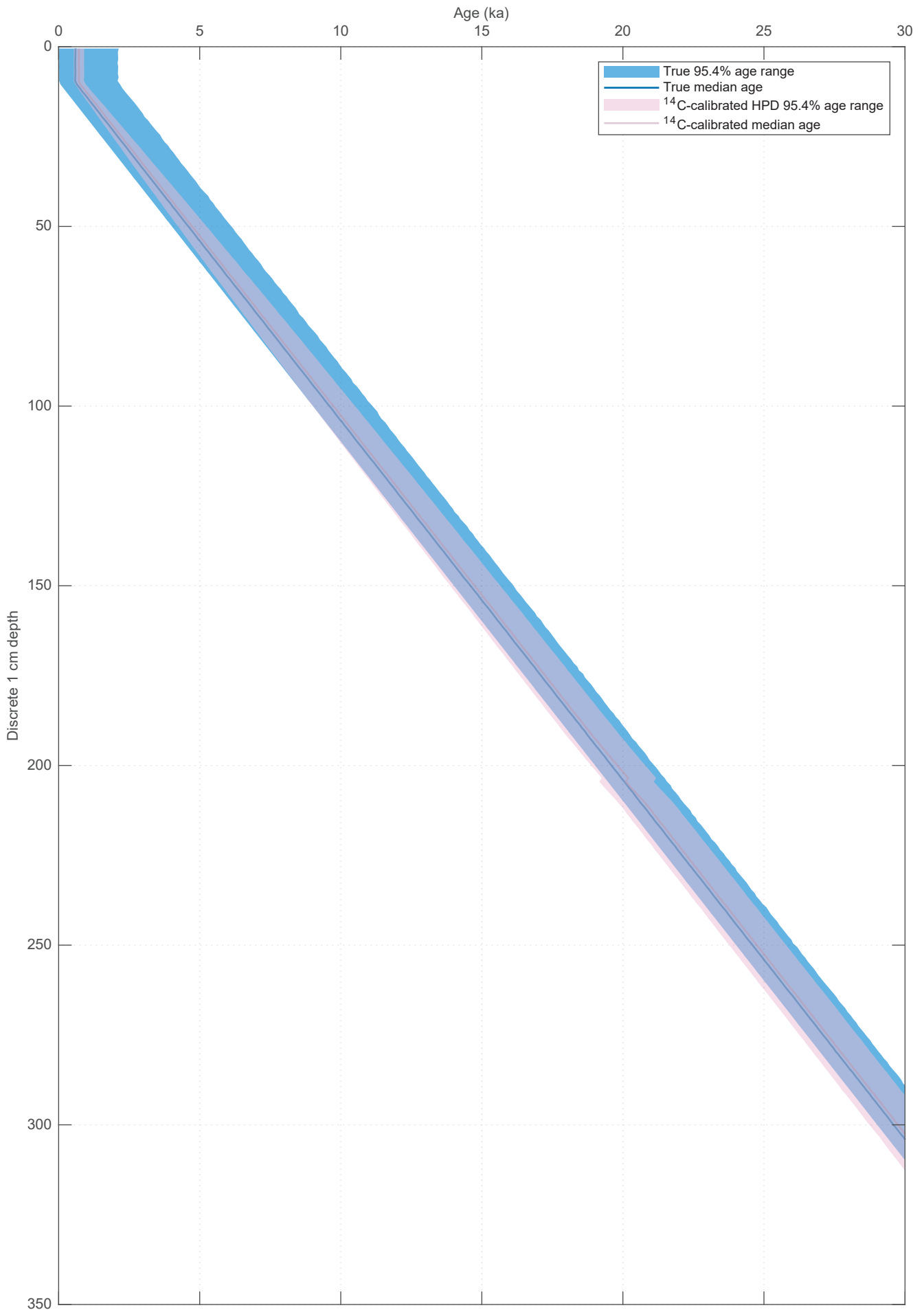
**Figure S12.** Simulated 1 cm discrete-depth 95.4% true age range (light blue), true median age (dark blue),  $^{14}\text{C}$ -calibrated 95.4% HPD age range (light pink) and  $^{14}\text{C}$ -calibrated median age (dark pink) for the scenario using constant  $\Delta^{14}\text{C}$  and dynamic BD as detailed in Fig. 5 (orange lines in Fig. 5).

Dynamic abundance (Fig. 5c) with constant  $\Delta^{14}\text{C}$ , constant SAR, constant BD and constant  $\Delta R$



**Figure S13.** Simulated 1 cm discrete-depth 95.4% true age range (light blue), true median age (dark blue),  $^{14}\text{C}$ -calibrated 95.4% HPD age range (light pink) and  $^{14}\text{C}$ -calibrated median age (dark pink) for the scenario using constant  $\Delta^{14}\text{C}$  and dynamic abundance as detailed in Fig. 5 (yellow lines in Fig. 5).

Dynamic  $\Delta R$  (Fig. 5d) with constant  $\Delta^{14}\text{C}$ , constant SAR,  
constant BD and constant abundance



**Figure S14.** Simulated 1 cm discrete-depth 95.4% true age range (light blue), true median age (dark blue),  $^{14}\text{C}$ -calibrated 95.4% HPD age range (light pink) and  $^{14}\text{C}$ -calibrated median age (dark pink) for the scenario using constant  $\Delta^{14}\text{C}$  and dynamic reservoir age ( $\Delta R$ ) as detailed in Fig. 5 (purple lines in Fig. 5).