

MicroRange, a tool for determining the stratigraphic distribution and geologic age of microfossils

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MicroRange is a software program that processes biostratigraphic information to provide a faster and more efficient method for making age calculations of microfossil samples. This software was created using the multi-paradigm programming language Python 3.6.5. Its algorithm was fashioned to calculate ages by taking into account the existing micropalaeontological associations in a sample, as well as the base and top occurrences of some microfossil species. To construct this software, we took into account the databases available on the Internet (i.e. Mikrotax.org of Young et al., 2017a, b) and papers with biostratigraphic and biochronological data (i.e. Lourens et al., 2004; Raffi et al., 2006; Jaramillo et al., 2011; Wade et al., 2011; Backman et al., 2012; Agnini et al., 2014). The database created from this software currently summarises the biostratigraphic distribution and bioevents of more than 1500 Cenozoic microfossil events of calcareous nannofossils, planktonic foraminifera and palynomorphs in northwestern South America.

The MicroRange operation calculates the numerical age range of a sample by means of its micropalaeontological content. In order to input information, the software only needs a micropalaeontological count table in Excel. The software can display results as a graphic of taxon distribution based on the Geologic Time Scale 2102 (Gradstein et al., 2012) and as a table with the biostratigraphic information presented by species (age range and author of the biostratigraphic datum) for each sample. This tool may be of benefit to the entire micropalaeontology community, and can be used both for academic and industrial purposes.

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