Revision notes

Manuscript title: Ordovician to Silurian graptolite specimen images for global correlation and shale gas exploration

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Comments from two reviewers are all considered and reflected in the revised manuscript. The main problem comprises two aspects, the dataset quality and the tool. We made the revision accordingly.

(1).The dataset quality, improvment

The dataset is updated and the newly uploaded to share. A new DOI is given in the revision. https://doi.org/10.5281/zenodo.619494

We re-organized all images and assured that every specimen image shows with the scale in its own photo or separated photo. Now the updated dataset includes 2951 images and the whole size is 10.4 G. every scaled photo file is named with a postfix S. The image name consists of the number of specimen and the species name. one only trouble is that the volume of the whole dataset is quite large. It takes a while to upload and download all files.

Now it is ensured that every specimen is shown with additional scale bar and that any measurement to the fossil is available.

The reviewer also stated that some images are not quite clear, or some images seem too empty. These are all problem of image quality. The new dataset, with more hi-resolution images and scale, some microscope images were selected for the case that the fossil itself is small but the whole specimens is quite large.

(2).The visualization tool

The FSIDvis is an interactive visual explorer of graptolite specimen image data (FSIDvis), which is accessed through:

http://fsidvis.fossil-ontology.com:8089/

Hit the spacebar to view the details of graptolite specimen. The tool, FSIDvis, is also updated and more detailed instruction of this software is given. the revision, in the fig caption part of this software.

The naming system or the method is explained in the text. Every image file is named after its unique number and labeled species name. When the specimens wad re-studied or transferred to another taxon, the file name does not reflect its taxonomic status. a brief revision record is given in the updated tool, FSIDvis. And I also suggest that readers or users of our dataset check our spreadsheet file for detailed information.

Furthermore, the whole text is revised in text and writing by colleagues. Hoping this version is much better.

Non-related part of fossil specimens collection is deleted as response to the first reviewer. TSNE, or t-SNE (t-Distributed Stochastic Neighbor Embedding), a technique for dimensionality reduction, is particularly well suited for the visualization of high-dimensional datasets that our specimens image dataset belongs to. We tried to analyze these data using this method and show a feasible way to classifying these specimens based on images only.