A NEW TEKTITE STREWN FIELD DISCOVERED IN BRAZIL: GERAIITES.

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Introduction: Tektites are rare natural glasses formed during meteorite impacts on Earth and found in strewn fields at hundreds of kilometers away from their source crater [1,2]. Although visually very similar to volcanic glass (obsidian), tektites have unique distinctive characteristics, the significant one being their extremely low (<0.03 wt.%) water content [3]. There are only six known strewn fields on Earth, four historical ones, namely the Australasian, the Central European, the Ivory Coast, and the North American strewn fields, as well as the more recently described strewn fields in Belize [4, 5] and in Uruguay [6]. It was recently brought to the authors’ attention the finding of a few unusual glass specimens in northeastern Brazil. Residents of two localities from northern Minas Gerais state independently sent us some of these specimens for analysis. Preliminary investigations allowed to exclude a volcanic origin. An expedition to the region was then conducted by the three first authors in November 2023, during which 10 specimens were found in the field (87 km apart from each other for the most distant ones) and some other specimens were obtained from local residents. Subsequently, several additional specimens were found by residents. A total of ca. 200 specimens has been collected so far.

Results and Discussion: The specimens, with masses ranging from ca. 85 g to <1 g, exhibit various shapes (spherical, ellipsoidal, teardrop, and dumbbell) (Fig. 1). They are all black in color (except for one olive green specimen), show characteristic pitted surfaces, and exhibit olive green to brown colors in transmitted light (when thickness is less than a few millimeters). Electron microprobe investigations of six specimens show that they are very homogeneous in composition and that rare lechatelierite inclusions occur. Microprobe data place the tektites in the dacite and rhyolite fields of the total alkali versus silica diagram, with similar SiO2 (between 70.3 and 73.7 wt.%) and slightly higher Na2O+K2O (between 5.86 and 8.01 wt.%) content in comparison with other known tektites (Fig. 2). ICP-MS data obtained for four specimens show some variations in trace elements from sample to sample, such as for Cr (10–48 ppm) and Ni (9–63 ppm). Water contents obtained for three specimens (using Fourier-transform infrared spectroscopy) are extremely low, ranging between 70 and 110 ppm, well within the range for tektites from the other known strewn fields (i.e., typical range for tektites is between 20 and 300 ppm [3]). 40Ar/39Ar dating is currently in progress.

Conclusion: The current area of occurrence of tektites defines a ca. 87 km long ellipse in northern Minas Gerais state. However, the extension of the strewn field is not yet well defined and probably extends over a (much) larger area. No impact crater possibly related to this tektite occurrence is yet known anywhere in Brazil, nor in neighboring countries. In conclusion, our work led to the discovery and confirmation of a new tektite strewn field, the 7th known in the world, hereby named “geraisites” (after the Brazilian state of Minas Gerais).