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## Forensic Geophysics: ground penetrating radar application in archaeological research in Tekoha Jevy village, Parana, Brazil

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Before the arrival of Europeans in South America, tribes of the Guarani ethnic group inhabited the places of the great Rio Parana, border of Brazil, Argentina and Paraguay. Tekoha Jevy village is located near the east bank of the Paraná River, in the city of Guaira in the state of Paraná, southern Brazil. In 2013, regional public and private companies denounced it as one of the numerous existing archaeological sites in the region places suffering irregular extraction, by economic, political and social conflicts. The Technical-Scientific Sector of Brazilian Federal Police investigated at the request of the police authorities and the Public Prosecutor's Office. The deposit of ceramic fragments in and around the homes of Tekoha Jevy, crafts indicators, tools, ritual objects and funeral urns, that can prove a crime against the historical and traditional occupation at the site, in a coveted area for the construction of an intermodal river port. The predominant rocks in the area are basalts of the Serra Geral Formation (150-130 Ma). The survey included mapping and surface collection, geophysical profiling, prospecting and subsurface anthropological characterization made through the applied geophysics of the Federal University of Paraná and the archaeological protocols [1] of the Institute of Historical and Artistic Heritage.

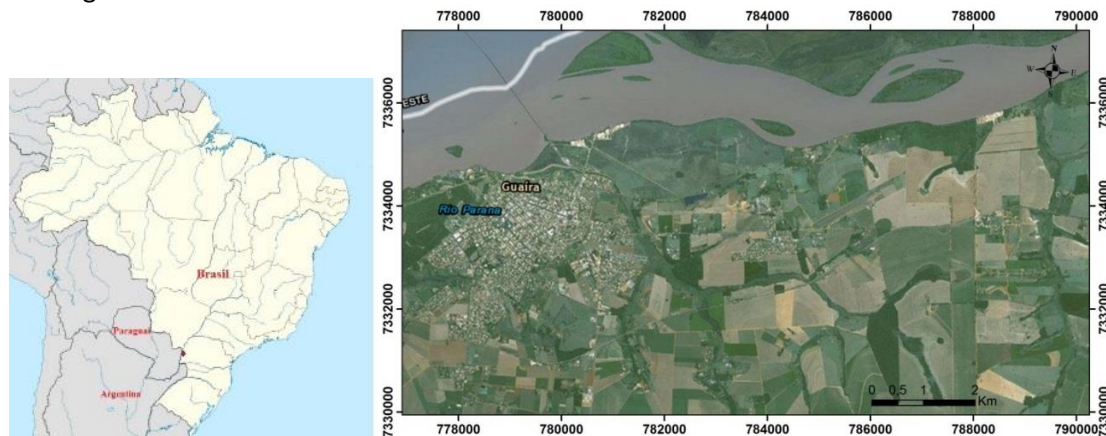


Figure 1: Tekoha Jevy village, on the banks of Parana River, Brazil (UTM WGS84 zone 21S)

The purpose of this abstract is to present the results of applying the geophysical method of ground penetrating radar in forensic examinations carried out by geologists and a multidisciplinary team. The equipment for the acquisition of geophysical data was the Duo detector of the Department of Federal Police of Parana, which consists on a shielded antenna 700 and 250 MHz. The geophysical survey included an area of approximately 30m<sup>2</sup>, resulting in a total of 32 profiles spaced 20 cm length, which were interpreted and analyzed in situ by means of 2D sections. The parameters used for field acquisition were spacing between lines of 0.02m, 512 samples per line and time window of 120 ns. In the analysis of 2D sections it was observed the presence of many anomalies possibly indicating objects in different soil depths. Two prospection excavations were made: in the first, there was the discovery of several pottery

fragments with irregular small formats and sizes, observed to a depth of approximately 0.30m. The second excavation in the ground, as directed, has been performed to remove a ceramic artifact of approximately 0.12m in situ. The geophysical method was essential to characterize and indicate possible traces, which were subsequently proven by excavations, however, at this initial investigation stage, no burial urns were detected that are supposedly buried on site.

*References:*

[1] Chartkoff, J. (1978) Transept interval sampling in forests. *American Antiquity*, 43(1):46-53

