

**IMPACT CRATERS IN BRAZIL: HOW FAR WE'VE GOT**

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The first mention to impact craters in Brazil was due to R. S. Dietz and B. M. French, in an article published in 1973 about two probable astroblemes, found with the help of ERTS-1 (nowadays LANDSAT) satellite images [1]. These were Araguinha Dome (d=40km) and Serra da Cangalha (d=12km). The authors reported evidences of shock metamorphism at Araguinha (impact breccia with PDFs in several directions), but none at Serra da Cangalha. At that time, the only known craters in South America were the young, small size meteorite craters of Campo del Cielo (Argentina, d=50m) and Monturaqui (Chile, d=460m), first reported in 1965 and 1966, respectively. The authors pointed out that Araguinha was one of the largest among the 40 astroblemes known on Earth at that time. Even though, it wasn't until the next decade that Araguinha's impact features were studied in some detail [2].

Since then, research on Brazilian impact craters has experienced some progress, although limited. In 1986, evidences of shock metamorphism were reported at Serra da Cangalha and Riachão [3]. The first review on the Brazilian craters, published in 1987 [4], added a 4th crater to the list, Vargeão (d=12 km), and pointed out two other probable impact sites: Colônia (d=3.6 km) and São Miguel do Tapuio (d=20 km).

The most recent review [5] shows the same number of proved craters, with a significant increase in the number of candidate impact sites, with the addition of Cerro Jarau (d=5.5 km), Piratininga (d=10 km), Santa Marta (d=10km), Inajah (d=6km) and Curuçá (d=1km) [6] [7] [8]. Another circular structure, named Aimorés (d=8.5km), should also be considered a candidate impact site.

The most recent among the proved craters is being reported at this meeting: the Vista Alegre astrobleme [9]. The period of nearly two decades between the discovery of shock metamorphic features at Vargeão and the announcement of Vista Alegre is suggestive of the limited research carried out in Brazil on the subject.

In summary, there are currently five proved impact craters and another eight candidate sites in Brazil. For a country with such dimensions (8.5 million km<sup>2</sup>), and a significant proportion of its territory comprised of geologically stable terrains, this is quite a reduced population. It suggests that a larger number of craters still remain to be unveiled in Brazil, in particular over the large extensions of the Phanerozoic basins that cover a considerable proportion of the territory. It should also be noted that there isn't a single buried crater known or suspected in Brazil, probably because the local petroleum industry hasn't paid enough attention to the fact that impact craters are a favorable site for oil/gas accumulations.

Limitations of in-country research funding and the lack of some analytical facilities for the study of impact-related features contribute to hold back advances on the subject. There are therefore good opportunities for collaborative work between Brazilian scientists involved in the study of impact craters and foreign impact research groups and institutions.

**References:** [1] Dietz, R.S. & French, B.V. (1973) *Nature*, v. 244, p.561-62. [2] Crósta et al. (1981) *Rev. Bras. Geociências*, 11, 139-146. [3] McHone, F. (1986), PhD thesis, Univ. Illinois/Urbana-Champaign. [4] Crósta A. P. (1987) In: Pohl J. *Research in Terrestrial Impact Structures*, 30-38. [5] Romano & Crósta (2004), 35<sup>th</sup> Lunar & Planetary Conference. [6] Hachiro J. & Coutinho (1993) 3<sup>o</sup> *Simp. Geol. Sudeste*, Brazilian Geol. Soc., 276-281. [7] Martini & Liu (1997) *VIII Simposio Latino Americano de Percepción Remota*. [8] Hachiro (2000) 31<sup>st</sup> *Int. Geol. Congress*, Abstract G2505011.