

BAJO HONDO, CHUBUT, PATAGONIA, ARGENTINA: A NEW METEORITE IMPACT CRATER IN BASALT?

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Introduction: Bajo Hondo is a very puzzling crater in Chubut Province, Patagonia, Argentina, (S 42°15' W 67° 55'). Diameter: 4.8 kilometers. This crater is in fact very similar to Barringer's crater, USA, but of a much more gigantic size. Bajo Hondo has a 100 to 150 meters raised rim. In the aerial photos there are also visible some 50-60 meters wide boulders resting on the crater's rim. Bajo Hondo is located in the Somuncura plateau, 10 km. SE to the Sierra de Talagapa stratovolcano. The Sierra de Talagapa, which is part of the Somuncura plateau, consists of a large 25 x 10 kilometer stratovolcano. The large Talagapa volcanic center was active during late Oligocene-Miocene times erupting both pyroclastic ignimbritic flows and basaltic lava flows [1]. Bajo Hondo has been interpreted as a collapsed basaltic caldera [1,2]. Close examination of satellite images (LANDSAT, X-SAR), aerial photographs, its published geologic map and a review of the geological characteristics of Bajo Hondo reveals flaws in the volcanic caldera interpretation. The lava in the surrounding plateaux was no doubt erupted from Sierra de Talagapa volcano during the Oligocene-Miocene. The crater is located on those older lava floods. The association of some lava floods to Bajo Hondo is quite doubtful. Probably the reported ones [2] were erupted by Sierra de Talagapa and not by Bajo Hondo itself. A reported "pyroclastic cone" located in the inner Western rim of Bajo Hondo [2] was probably erupted by Talagapa and now it is just an eroded and collapsed part of Bajo Hondo's rim. There is also good evidence of uplifted strata exposed in the inner rims of Bajo Hondo. Uplifted Talagapa's basaltic rock strata were probably misinterpreted as "vertical or almost vertical basaltic dykes located in the inner rims of Bajo Hondo" by the volcanologists [2]. Rocks exposed on Bajo Hondo's rims are clearly pyroclastic: 1) Lapilly-like basaltic breccia enclosing irregular clasts and blocks up to 3 meters in diameter. 2) A great abundance of 13 to 7 centimeter wide brown-redish scoriaceous bombs showing aerodynamic shapes and deformation. The peculiar shape of those glass bomb bodies prove that whilst still in a viscous state they must have flown through the air i.e. were ballistically transported. The same type of rocks are present in Lonar Lake's crater rim, a well confirmed impact crater in basalt in India [3].

Bajo Hondo could be a gigantic maar [4]. Comparing aerial photos of both Bajo Hondo and several maars shows that they are very different both in their shape and rim's characteristics. The hypothesis of Bajo Hondo as a maar can not be completely rejected at the present stage of investigation but so far it seems to be quite unlikely. Bajo Hondo is probably too big to be a Maar.

If Bajo Hondo is in fact a maar then it would be the largest maar in the World. The author believes Bajo Hondo is in fact a misinterpreted gigantic simple-type impact crater located on a volcanic plateau. Lonar Lake impact crater was misinterpreted as a volcanic caldera for many decades [3]. The age of Bajo Hondo crater is estimated in less than 10 Ma. Further investigation of this interesting crater is in progress.

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References: [1] Ardolino A. (1987) *Dirección Nacional de Minería y Geología Boletín* 203:1- 91 in Spanish [2] Ardolino A. and Delpino D. (1986) *Revista Asociación Geológica Argentina* 41:386-396 In Spanish [3] Fredriksson K. et al. (1973) *Science* 180: 862-864. [4] Ollier C.D. (1967) *Bulletin Volcanologique* 31, BV: 45-75.