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Biodiversity and Mars Meteorite Analog of Tintina Stone at Darima, Ambikapur, Surguja CG , India

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Abstract:

An exploration was conducted for geo biological study of 'Tintina stone' situated at 13 Km away from Botany Dept. at Ambikapur. The geological position of 'Tintina stone' is $22^0$59'52.27'' N; latitude, $83^0$10'56.74'' E longitude and 535 meter altitude. It is located at Darima village beside temporary air base of Ambikapur CG India. The exploration timing was winter season (Dec.2014) an at atm. temp. 15^0C.

Biodiversity on Tintina stone, common stones, and land around Tintina stone' was observed. Their samples along with soil sample of the land below Tintina stone' were collected for identification of microbes. Physical measurement was done and morphology of Tintina stone' was observed. The cup like pits present on it represents an analog with meteorites of mars. The tuning property of Tintina stone' like bell metal was recorded. Comparative musical property of 'Singing stone' and 'Musical stone of 'Stonehenge' is discussed.

Key words:

Tintina stone, Musical stone, Meteorite analog stones, Meteorites of mars, Lithophytes

1. Introduction:

The morphology of Tintina stone is found to have an analogy with mars meteorites. There are many meteorites found all over the world. Most of them have been found to be came from mars (1,2) The discovery of tiny carbon rich balls and microtubules inside a Martian meteorite, has the possibility

that the red planet was teeming with primitive life millions of year ago. The meteorites, which fell during Stone Age, contains microscopic burrows and spheres that resembles the marks micro-organisms leave when they eat through rocks on earth (3, 4). These features seem to have been pressed into the mars rock before it was hurled off the red planet by impact event. The researchers are not claming they have found evidence of ancient life on mars. In fact, in their papers, they do not use "world life". Their preferred term is "biotic activity". But their findings revive the debate about the possibility of microbes in "mars" past through information gained from Martian meteorites that end up on earth. (5, 6, 7)

The most common meteorite in mars is named as Allan Hill (ALH14840001). It was found in Allan Hills, Antarctica on December 27, 1984 by a team of U.S. meteorite hunters. In their project. ALH14840001 is displayed at Smithssonian Museum of Natural History. In their project, they found a group of SNCs (Shergottite, Nakhlite and Chassignite) from the meteorite. ALH14840001 is thought to be from Mars, It's mass is 1.93 kilograms (4.3 lb) Scientists announced that it might contain evidence for microscopic fossils of Martian bacteria based on observed carbon globules (8, 9, 10)

An another Mars meteorite (1611x1086 astrobiology .com) is one of the oldest piece of the solar system, proposed to have crystallized form of molten rocks 4.091 billion years ago.(11), based on chemical analysis , it is thought to have it's life originated from Mars (12), from a period when liquid water existed on the planet surface which now has turned in to barren land.(13,14).

The theory holds that ALH14840001 was blasted off from the surface of Mars by a meteorite impact 4.5 billion years ago and fell on earth roughly 13,000 years ago. These dates were established by a variety of radiometric dating techniques including Samarium –Neodymium (Sm-Nd) , Rubidium – Strontium (Rb-Sr) and Carbon-14. The meteorite that have a potential to biological markings, have generated interest because they are originated from 'wet' Mars.(15)

Deepa Gopal studied 'The Musical stones of Stonehenge" .in Africa's Serengeti, and in the caves in the south of France. These stones are either artificially arranged in such a position that music sound is produced by hit , or they are naturally arranged in such position , that singing – whistling sound is produced when wind blows through it in specific direction . Their exact purpose is not known but it appears that our ancestors have gone to great length of time to collect these stones. The Stonehenge builders had hauled blue stones from hundreds of kilometers. These stones produce a "gong" like sound instead of a 'dull clunk'. This discovery increases the interest in a structure that has baffled archeologists for a long time (16)

Objective of this paper is to explore the natural tuning Tintina stone and compare its morphology with various meteorites of Mars and lay a basis of similarities, in origin and structure between Tintina stone and Mars meteorite. Secondly, to show the extra ordinary behavior *i.e.* the tuning property of Tintina stone and compare it with the singing stones and musical stones of Stonehenge.

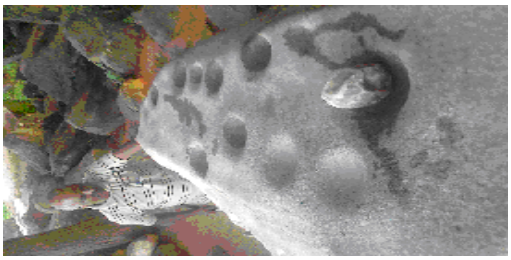
2. Material and method

The exploration of Tintina stone'was conducted. A magnifying glass, brinton compass, thermometer, meter tape, knife, and sample collecting kit were arranged and carried. 'Tintina stone' is found in Surguja district, approximately 13 Km. away from Ambikapur, the head quarter of Surguja division, on national highway N^0 43 in east – south direction. Tintina stone'was visited in winter season (Dec. 2014) at the environmental temp.15^0C. Started from Ambikapur on Raigarh road (NH-43), just after 01 Km. it is bifurcated. We followed right side on Damali road and after 10 Km., reached Darima village and again right turn moving 1.5 Km to reach Air Base. Beside Air Base at 0.5 km distance, Tintina stone was observed put on many other common stones under mango tree, (*Mengifera indica di Anacardiaceae*) . The geographic position of Tintina stone'is 22059'52.27" N latitude, $83^0$10'56.74" E longitude and 535 m altitude.

Morphological parameters of Tintina stone'are measured and physical specifications are noted. The tuning sound is produced by hitting Tintina stone'with a piece of stone (shown in fig. 1, put in a cup like pit), sound was recorded and photographs were taken. Biodiversity on Tintina stone'was observed with magnifying glass. Lower surface of Tintina stone'and it's near by common stones were scratched with a sharp knife and samples were collected along with the soil samples for microbial identification.

The microbes of all collected samples in this exploration were examined under high power microscope. Their identification was done in the collaboration with district biotech lab. Surguja, Universe Research Center Ledari and Biotech department in Surguja University Ambikapur.

Mars meteorites were searched in wave sites and set an analogy with Tintina stone', on the basis of external morphology. Singing stone and musical stones are also searched in wave sites and compared with 'Tin-Tin' tuning sound of Tintina stone'.



Fid.1 Morphology of Tintina stone

Fig 2. Closer view of Tintina stone

Table1 Biodiversity of Tintina stone‘ and its surroundings:

So	**Location**	**Class of life**	**Name of Organism**
1	Upper surface of ’Tintina stone’	---Nil--	---Nil----
2	lower surface of ’Tintina stone’	`1. Fungi	*Cudelo duluca, Christine case, Monterey caryon.*
		2. Bacteria	*Thiobacillus thioparus, Desulpho vibria.*
3	Common stones	1.. Micro fungus	*Cudelo duluca, Christine case, Monterey caryon.*
		2. Mega fungus	*Amyloasterium areolatum*
		3. Lichen	*Labaria pulmonaria*
		4. Bryophyte	*Spores of Riccia and Finaria*
4.	Land around ’Tintina stone’	1.Trees	*Mengifera indica (Anacardiaceae)*
		2.Shrubs	*Hibiscus rosa sinensis*
		3. . Herbs	*Commelina1 benghalensis, Cyanodon dectylon, Parthenium histosporus, Cassia tora, Sida acuta*
		4.Insects	*Beetals : Elytra, Ambrasie, Termites. Cockroach (Periplanata flavicornis) Anopheles , Culex, Musca domestica*
		5.Annelids	*Pheretima posthuma*
		6.Platihelminthes	*Planaria* (Flate worm)
		7.Nematohelmint hes	*Ascaris sp.* (Thread worm)

5	Soil Microbes	1Fungi	*Trichoderma virdi*
		2/Cyanophycian Algae (Cyanobacteria)	*Tolypothrix (Scytonematacea), Calothrix (Rivulariaceae), Mastigocladus laminosus (Stingonemataceae)*
		3.Bacteria	*Rhizobium leguminisorum, Clostridium pasturianum, Nitrobacter nitrificance*

3. Observation and Result

Table 1 represents biodiversity of Tintina stone‘and its surroundings. There are no life particles on its upper surface, but on the lower surface, five micro organisms were found. Although there is a common biodiversity around Tintina stone‘. There is a less number of lithophilic microbes *i.e.* only five are hardly identified. It is due to deficiency of elements having less melting point (less than 200^0C) *e.g.* M.P. of potassium (K) is 64^0C, Na = 98^0C , S= 113^0C *etc.* These elements were burn out at the entrance in earth’s environment. The heavy metallic elements of high melting point remain left in the meteorite, *e.g.* Tin = 232^0C, Zn= 420^0C, Ag = 962^0C, Cu = 1083^0C, Si = 1410^0C , and Fe = 1538^0C. Therefore “Tintina stone” behaves as a metal and produces tuning sound on hit.

Table 2. Physical parameters of Tintina stone:

Srl.	**Structure and parameter**	**Observation / values**
1	Surface view	Rectangular
2	Shape	cylindrical to cubical
3	Weight	135.5 Kg
4	Size (a) Length	80 cm
	(b) Width	44cm
	(c) Perimeter	89cm
5	Minimum depth of the Pits	0.6cm
6	Maximum depth of the Pits	4.5cm
7	Number of pits on upper surface	29
8	Number of pits on lateral surface in east side	21
9	Number of pits on lateral surface in west side	16

10	Average diameter of pit	4.0cm.

Fig1 represents ’Tintina stone’ at Darima, Ambikapur CG India, and fig.2 represents its closer surface view. Table 2 represents external morphology and physical parameters of ’Tintina stone’. The morphology of the ’Tintina stone’ appears as a meteorites having deep pits at regular distance. A stone piece of about 2.0 cm diameter was used to hit the ’Tintina stone’ and tuning sound was produced result, was recorded. The tuning sound is just like the sound produced with any bell metal, ‘Tintina stone’ is suggested to be composed of ignaceous rock and gray granite with fine particles of Silica.

Author expected any martial micro flora, at nano level but an electron microscopy only may confirm those bacteria. Here the motto of paper is to explore musical property and explain its physical causes as an analogy of mars meteorite on the basis of its morphological affinities. Table 1 represents similarities and dissimilarities between mars meteorite and Tintina stone. The physical properties of mars meteorites has been taken from net literature survey, while; ‘Tintina stone’ if physically observed.

Table3 represents comparative physical properties between mars meteorite ALH84001, Tintina stone , it’s piece (found at pit shown in fig1.) and a common red stone . Since red stone is earthly origin there fore it has yellowish –pinkish look and lees density. ‘Tintina stone” and it’s piece are of space origin , there fore they are white in texture ash like but have more density due to only heavy metals. The density of Tintina stone is equal to the piece of it’ pit, texture (looking) is also same. This piece may have come at cup formation time with cohesive force or molecular attraction force (25, 26, 27).

Consolmagno *et al* studied various type of density like bulk D, Specific D, and crude D along with porosity of meteorites and rocks and stones there fore porosity is took from paper by Consolmagno *et al* (28) .Density is calculated simple weight and volume method. Volume is measured by dipping in fulfilled jar and water flown is measured and applied D = M / V... Table3 represents that more similar to mars meteorite rather than a common red stone.

Table3. Comparative Physical parameters between mars meteorite, Tintina stone Piece of Tintina stone and Common red stones ;

Sr.	**Properties**	**Mars meteorite**	**Tintina stone**	**Piece of Tintina**	**Common red stone**

		Allan Hills 84001		**stone (white stone)**	
1	Weight	1040 gm	135500 gm	992gm	880 gm
2	Volume	3125 cm^3	47733.50 cm^3 cm^3	350 cm^3	362cm^3
3	Density	3.2 gm/ cm^3	2.83 gm/ cm^3	2.83 gm/ cm^3	2.43 gm/ cm^3
4	Porosity	100%	100%	100%	75% to -90%

4. Discussion:

Author appreciates Scientists about expected life particle Yes It might be , in condition. of Pans *Permian Theory* of origin of life at cosmic level , but **"not observable at all"** in the conciliation of meteorite formation . But, at present time after longer geological time by adaptation of earth's environment what-ever lithophytes life is grown is represented in table1.Scientists study of hydrophytes in marine ecology, xerophytes in desert botany, mesophyte in forest study . In this paper, authors studied lithophytes *i.e.* life on stone, is a new idea. Even though on specific stone "Tintina"-simulating double , stringing or tuning stone as well as morphology observed like mars meteorite.. Since Tintina stone is under Temple authority, so probe of density is not permutable. Although mathematically calculated value, with other comparative similarity and dissimilarity (analogy) is represented in table3.

Archimedes (287-212BC) formulated pie *i.e.*

Π = Perimeter / Diameter = 22 / 7

Perimeter *of* Tintina stone = 89 cm.

Π = 89 / Diameter = 22 / 7

22 x Diameter = 89 x 7

Diameter = 89 x 7. / 22 = 28.32 cm.

Radius = Diameter / 2 = 28.32 / 2 = 14.16 cm.

If we assume a cylindrical geometry in morphology of Tintina stone

Volume of a cylinder = $\Pi R^2 h$ *here h = height or length= 80 cm.*

Volume =(22/7) x $(14.16)^2$ x 80

V_1= 22/7 x 3200.5 x 80 = 352880 / 7 = 50411.428 cm^3

Although Tintina Stone might be assumed as a cube shape due to irregular geometry of meteorite nature.

There fore Volume of a cube = length x width x height

.From observation table1. Thus, Tintina Stone's values would be -

V_2 = 80 x 44 x 14 cm^3 = 42,280.00 cm^3

An average volume of Tintina Stone = $V_1 + V_2 / 2$ = 50411.428 + 42,280.00 / 2

= 00601 / 2 = 49845.5 cm^3

Since It has pits filled by air, There fore, real volume would be 49845.5 cm^3 -- area of pits.

Average depth of pit = (minimum + maximum) / 2 = (0.6 + 4.5) / 2 = 5.1 = 2.55 cm

And an average diameter of pit = 4.0 cm therefore r = 2 cm

Thus average area (*a*) of 01 pit = $a = \pi r^2 h = (22 / 7) \times (2 \times 2) \times 2.55$

$= (22 / 7) \times 10.3 = 224.4 / 7 = 32.0\ cm^3$

Therefore area of all pits = total number pits .x $32.0\ cm^3$

= (29 + 21 + 16) x $32.0\ cm^3$ = 66 x $32.0\ cm^3$ = $2112\ cm^3$

Therefore area of Tintina stone = A – a = 49845.5 cm^3 — $2112\ cm^3$ = 47733.50 cm^3

Density of Tintina stone = Mass / Volume = 135500 / 47733.50 cm^3

2.8386 / cm^3

Meteorites, that fell in the earth's atmosphere got burned and melted by air friction and oxidation. Most of C, P, S, Na, K etc. non metallic elements did burn out as oxides, since these have less melting point. The volume (space) of those burned out materials made cavities on the melting meteorite falling to earth. Those cavities appear cup like pits on the surface. Only heavy metallic elements are thus left behind in the meteorite.

The cup like many pits provide an air space to vibrate stone particles for producing sound by hitting. Although, 'Tintina stone' also has an air gap in bottom and looks like fallen from sky and put on other common stones. The sufficient air gap below 'Tintina stone' results in vibrating and production of musical tuning sound on hit "Tinn-tinn", therefore, it is called 'Tintina stone'.

Such morphology, having cup like pits, is also seen on Allan Hills 84001, most common meteorite found in Allan Hill, Antarctica on December 27, 1984 by a team of U. S. meteorite hunters. Allan Hills 84001 is thought to be from Mars; however it does not fit to any of previously discovered SNG groups. In Research, it's mass was 1.93 Kg (4.3 lb.) It was headlines worldwide in 1996, when scientists observed carbonate globules and based on it , they announced that Allan Hills 84001 might contain evidence for microscopic fossils of Martian bacteria. (17,18)

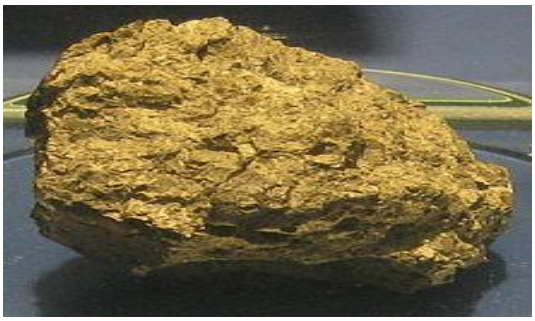


Fig 3.Allan Hills 84001 (ALH84001)

Fig4."1611 × 1086 - astro-ecology.com"

There are abundance of mars meteorites in The National Museum of Natural History, a part of the Smithsonian Institution, About all of them have cup shaped surface (19), There fore , Mars is suggested to has liquid surface in ancient era. Since the photograph of flood's water current in river shows morphology of cup like surface.

Fig 4 represents another meteorite '1611 x 1086- astro-ecology.com ' It shows more similar cup like pits on it's surface. Fig 5 represents the bursting out of material, to be a meteorite named as "(410 × 410 - solar6voyages.wikispaces.com)".Fig .6 represents a meteorite as a solar voyager, and fig.7 represents mars meteorite from U K, (38 × 526 – By dailymail.co.uk) a meteorite on earth surface. Thus Fig 5, 6, and 7 represent process of meteorite's formation. It is suggested that starting from mars, a meteorite moves in space passing through various environments having high and low temperature.

At the entrance of the earth atmosphere , about all non-metallic elements were burn out and that space leads to cup formation similar to the surface view of 'Tintina stone' *i.e.* represented in fig 1. On the basis of cup like pits found on 'Tintina stone' it is firmly considered to be a mars meteorite and its tuning property supports to this view.

Fig5.(solar6voyages)

Fig 6. Medicaldaily.com

Fig 7. (By dailymail.co.uk)

There is also an another view that the wave like pits found on mars meteorite indicate that at any far ancient geological time before being meteorite, as a part of mars, it had a liquid flowing surface.(10) Liquid may be considered to be methane, ethane or water.(17) Author took photograph of water current of Hasdeo river, which is represented in fig 8 .Fig 9 represents high magnified view of fig 8, in which , water molecules are arranged in a row. The pit may be clearly observed on river current surface simulating the cup like pit of fig 7.

Fig8 River current

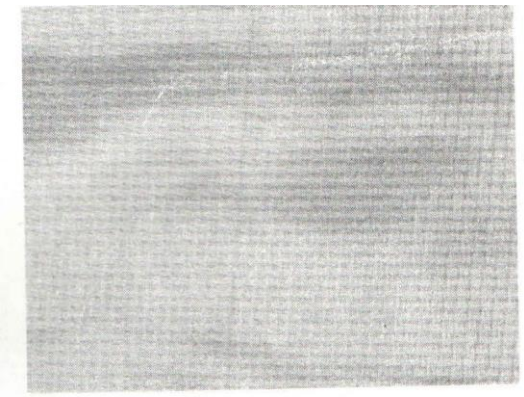


Fig9 magnified niew of river current

'Tintina stone ' is quite similar to the musical stone of Stonehenge Fig. 10 represents musical stone , there are 08 tuning stones arranged in a specific sequence , that a sound of successive frequency is produced by sharp hit one by one, same as musical tune, in gamut for an octave (25). Musical stones are different from singing stone. Singing stones produce 'whistle' sound with wind blow, like bag pipe or bamboo pipe. But musical stones produce sound by sharp hit to it. 'Tintina stone" is single piece musical stone and also a mars meteorite analog.

Fig. 10. Musical-stones-stonehenge

Fig1. The Singing Stones of Stonehenge

There is further scope of this study micro flora may be discussed in a view of ecological succession .It is found that the development of vegetation on 'Tintina stone ' *i.e. Xerarch succession* is already started on side surface. But it is yet to start on upper surface of 'Tintina stone '.While, common stones surrounding 'Tintina stone 'has been reached up to Moss stage. On 'Tintina stone', the development of vegetation would be very slow due to deficiency of C, P, S, Na, K *ect*. non metallic elements.

5. Conclusion

On the basis of similarity in tuning property and outer structure of 'Tintina stone ', an analogy with mars meteorite is considered. 'Tintina stone "and mars meteorites posses same morphology, *i.e.* cup like pits on surface, therefore 'Tintina stone ' may be applied for astrobiology to research on mars meteorite

In this exploration, an extraordinary behavior of 'Tintina stone '*i.e.* its tuning property, was recorded. 'Tintina stone' is quite different from singing stone of Stonehenge , where , about 21 stones are naturally found in such position , that it produces loud sound with blow of wind . This natural song is celebrated in Pagan culture of Druids people speaking Gaelic language. They worship natural forces and connect with them through rituals. They sing and dance around it in a circle.(16,24) The 'Tintina stone ' is devoted to Hindu Deity ' Hanuman, similar to Greek God Typhoon.

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