CHAPTER - 4.6

PALEONTOLOGICAL STUDY OF DINOSAUR’S EGGS AND NESTING SITES

INTRODUCTION

The era of Dinosaurs was Mesozoic. Three periods comes under this era-Triassic (245-208my), Jurassic (208-144my) and Cretaceous (Chalk-144-66.4my). It doesn’t mean that there were no dinosaurs during the missing time period but might be removed by some natural calamities like erosion. In addition to some fossil record of dinosaur eggs, their remains also include eggshell fragments and various nesting sites, which have also been explored from the top most layer of the Lameta of the study area.

The Bagh (Central India) dinosaurs are the earliest Cretaceous dinosaurs known from India. Dinosaurs were the giant as well as smaller extinct reptiles, emerged during the late Triassic period (220 million years ago). They ruled the earth over 160 million years and vanish at the end of the Cretaceous period, perhaps due to the consequences of asteroid impact, choking chemicals from erupting volcanoes, climatic change, and other possible factors. Dinosaur fossils were scientifically described by Buckland in 1824, a professor at Oxford University. India’s first dinosaur was reported from Jabalpur, Madhya Pradesh by an army officer Captain W.H. Sleeman in 1828. Owen (1842) coined the term “Dinosaur” derived from the Greek word “Deinos” meaning terrible and “Sauros” meaning lizard. The record of dinosaurs in India spreads from the late Triassic to the end of the Cretaceous (225-265 million years ago), but the most common findings were in the Jurassic and the Cretaceous. On the basis of dinosaur remains, India has been divided into the three geographic regions (Sahni, 2001) Western region comprising the state of Rajasthan and Gujarat, the Central region includes Madhya Pradesh and Maharashtra and Southern region has Andhra Pradesh, Tamil Nadu, and Karnataka (Fig.8.1).

Madhya Pradesh represents the richest dinosaurian sites, but more exploration is still needed. The most famous and the oldest locality of the central sector is the Bara Simla Hills in Jabalpur, Madhya Pradesh, where the first report of dinosaur bones was
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reported by Sleeman. Several sites of dinosaur remains were reported near the town of Dahod and Bagh. Recently in Bagh, the dinosaur bones were explored for the first time from Nimar Sandstone in district Dhar Madhya Pradesh (Khosla, et al. 2003). From the upper Cretaceous Lameta formation of India, a large number of dinosaur nesting sites have been documented. Based on the general morphological and histostucture, diversity is noticed in the eggshells, which are parataxonomically assigned to different dinosaur families. Dinosaurs were oviparous reptiles, gave birth by laying eggs. The eggs were large, oval or sphere shaped and yolk shelled with embryonic membranes. Dinosaurs were also very diverse in nature.

Fossil eggs and their shells have been found in all the continents except Antarctica. Their emergence begins with upper Triassic (Hirsch, 1989; 1994b; Mikhailov et al., 1994) and continuous up to the end of Cretaceous. These with their wide range, continuous to be together with their specific, precise, geographic, stratigraphic, paleobiologic, and paleoecological significance (Horner and Makela, 1979; Hirsch, 1994b; Mikhailov et al., 1994), it is essential to form a uniformly applied parataxonomical system. The use of this system will also aid in the improvement and advancement of this branch of paleontology. It is very difficult to recognize, every egg or eggshell fragment, all the time. The process of deterioration viz. alteration, weathering etc. has a remarkable effect on the eggshell. It creates a problem in recognition of genera. The taxa that possess faint shell units but clear and specific growth rings like ovalalithid, spherooolithid and prismatic eggshells are baffling and complicated to identify. It is better to refrain from identifying an eggshell by only one character. The edge of the eggshell has to be observed with a good hand lens for comparison, but preferably microscopic thin sectioning and SEM study will be more fruitful for proper identification.

Eggs are the reproductive byproducts of an environmental adaptation within a distinct phase of vertebrate evolutionary history. The evolutionary trend i.e. concluding mode was obtained from the lowest grade to the highest. On the basis of parataxonomy of egg shell structure, the work done at present helps to divulge and place the observed dinosaur eggs, in their proper systematic position and correlate evolutionary history. The mould of dinosaur eggs possesses sediments, which helps to know the Cretaceous mode.
and trends of climatic fluctuations. Applying microscopy, new research has been done in the recent years on the fossil dinosaur eggs. The results come out with the discovery of extreme diversity in microscopic structures of egg shells. If comparison of cross sectional study has been done to establish the taxonomic position, potentially consistent evolutionary direction and ancestral relationship could be erected.

In the world, dinosaur eggs burials are found most constantly in China. In establishing the Cretaceous-Tertiary boundary within the red Beds of South China, these eggs are of great practical importance. Zhao (1979), a Chinese paleontologist, made a parataxonomic classification for classifying dinosaur eggs and material of eggshells. He classified them into seven distinct families. The parataxonomic classification was combined with the structural classification of fossil eggs and their shells. Taxonomically valuable features of the eggshell, ultrastructure and histostructure are its base. Three hierarchical categories: oofamily, oogenus and oospecies were taken into account, in classifying fossil egg parataxa. The usual morphological features like sculpture, the shape of the egg and ranges of shell thickness can be used as keys are of the central importance for preliminary specimen identification (Mikhailov, 1966). The basis used for these groups are:

1) The structural surface helps to recognize oofamilies easily.

2) The oogenera are identified on the basis of egg shape, variation seen in the morphotypes, poresystem, and sculpturing of outer surface of the shells.

3) Oospecies are based in particular by quantitative features, exact range of shell thickness, egg size, external pore patterns, and details of sculpturing.

Hirsch & Quinn (1990) and Hirsch (1994a) have worked a lot on structural classifications. A structural parataxonomical classification on the basis of dinosaur egg shells has also been put forward by Hirsch. He classified ten distinct dinosaur eggshell morphotypes on account of their general histostructure and ultrastructure. Hirsch (1994b) built up a new family on the basis of the associated embryos i.e. Parismatoolithidae under dinosauroid – prismatic basic types for the eggs and eggshell of the protoceratopsids and hypsilophodontids. Five different pore system, their patterns, and external ornamentation
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were classified by him. A better account of the new classification system is given by Hirsch (1994a) and thus guided to make correlation between parataxonomic families with structural morphotypes and the basic type of eggshell organization.

Vianey-Liaud et al. (1994) reassessed the upper Cretaceous dinosaur eggshells of Southern France. He put forward and propounded a new oogenus *Megaloolithus* for the French eggshell material. His amended parataxonomic system of classification by assigning three new egg genera and six egg species.

An appreciable progress has been made in the span of last thirty years in identification of different types of dinosaur eggs and eggshell fragments from different areas in India. In the primitive stages, an informal form of nomenclature was used. The kind of terms used were Type A and Type B (Shrivastva et al., 1986); Type I and Type II (Mohabey, 1984; Mohabey and Mathur, 1989) and TST – I to TST – III (Sahni, 1993; Sahni et al., 1994).

Classification of the Indian dinosaur eggs and eggshell material has been established in an entirely new manner by Khosla and Sahni in 1995. They proposed a new parataxonomic scheme for classification of dinosaur eggs and eggshell material. This parataxonomic scheme is on the basis of the description of the new oospecies and in contrast with their previous acquainted forms. Seven typical oospecies were reported by them and these have been consigned to the oofamily Megaloolithidae of Sauropod group and the other one to the oofamily Subtiliolithidae of avian or Theropod group. These oospecies are (Fig.8.2): *Megaloolithus cylindricus*, *Megaloolithus jabalpurensis*, *Megaloolithus mohabeyi*, *Megaloolithus baghensis*, *Megaloolithus dholiyaensis*, *Megaloolithus padiyalensis* and *Megaloolithus walpurensis* of Sauropod group and *Subtiliolithus kuchchensis* of Theropod group (Khosla and Sahni, 1995).

Till now, fourteen oospecies from India (Khosla and Sahni, 1995; Mohabey, 1998) have been ascribed to the oofamily Megaloolithidae (Vianey-Liaud et al., 2003).

On the basis of the following structures the new parataxonomic scheme for narrating Indian dinosaur eggshell types has been prescribed.
1. **Ultra structure (texture of eggshell)** – Ultrastructure shows that fine organization of calcareous material in a series; comprising of horizontal ultrastructure zones (zone of tabular or squamatic, crystalline aggregates). This merges with the organic network or layers of the eggshell.

2. **Micro structure (general histology)** – This points out to the histomorphology of the calcareous material of the shell unit (organic core, eisospherite, basal cap, mammillae, wedges and prisms, or continuous shell layer etc.) and the position of the pore system (pore canals etc.).

3. **Macro structure (general morphology)** – It deals with the size and shape of egg, eggshell thickness, patterns of the pore and sculpture of the outer surface of the shell.

A basic dinosauroid eggshell arrangement is observed in almost all the dinosaurian eggshell types (Mikhailov, 1991) except the Ornithoid type (Hirsch and Quinn, 1990; Mikhailov, 1991). Seven new oospecies are clearly seen to be of tubospherulitic morphotype. Ratite morphotype represents the eight oospecies (Hirsch and Quinn, 1990; Mikhailov, 1991).

A systematic search in the area under investigation associated with new occurrence of dinosaur eggs from the Lameta formation from the study area of Dhar district i.e. Padalya. It lies 4.5 km of the North West direction of Bagh village and 62 km away from Dhar district. At present, fossilized dinosaur’s eggs and eggshell fragments were studied by the author noticed from the study area.

In addition, some nests were also observed, but unfortunately no associated skeletal or embryonic remains were found, which could warrant proper affiliations of these egg shells to the generic level. The nests of dinosaurs were put down on the ground and eggs were placed on soft muds, sands and soils near lakes and rivers. The thorough study of dinosaur eggs includes their identification and classification, following the paratayonomic scheme of egg shells given by Khosla and Sahni (1995). On comparing the ultra, micro and macro structure of collected fossil egg material with previously known forms, the oospecies, recognized in the study area *Megaloolithus jabalpurensis*. 

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DESCRIPTION OF SPECIES

Basic Organizational group: Dinosaur – spherulitic
Structural Morphotype: Tubospherulitic type
Oofamily: Megaloolithidae
Oogenus: Megaloolithus
Oospecies: Megaloolithus jabalpurensis

Material: One complete egg, six partially broken eggs, and twenty eggshell fragments. DEN.1 (complete egg) and DEN. 2-7 (incomplete eggs)

Horizon: Lameta formation (Late Cretaceous)
Locality: Padalya district Dhar of Madhya Pradesh.

Size and Shape of the egg: The eggs are sub spherical in shape and the egg diameter is variable from 150-170mm in diameter.

Eggshell thickness: The eggshell thickness ranges from 1.0-1.22mm.

External surface: In every eggshell fragments, the nodose ornamentation are portrayed well. The shape of the nodose is subcircular and they are scattered sporadically in some specimens while closely spaced in others. It is observed that in the tangential thin sections, one or two nodes usually found to combine with each other. Under the crossed nicols, the extensive disappearance prototype is also noted in the nodes. The nodes are elevated to about 0.31mm, above the surface of eggshell. The diameter of the nodes ranges between 0.33-0.58 mm while its average diameter is 0.44 mm.

Radial view: The spheroliths found in the oospecies are rather flat. They differ in width and shape and come into view as a fan. The spheroliths get thinner at both the ends while...
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the upper part is convex in shape providing a nodular appearance to the egg shell. In some sections, the upper portion of spherolith can be viewed in a truncated form. The eggshell fragments collected from Padiyal show less fanning as a result the mixing of parallel and conical lateral outline of the spheroliths. All the analyzed sections show that each spherolith ending into a single basal cap, while in the Padiyal, specimen the two basal caps merge with each other to form one spherolith. The merging of the two spherolith is a commonly seen feature, whereas the individual spheroliths are not obviously observed. A few small spheroliths having 3/4th of the eggshell thickness are found in between the large spheroliths. The variation in the shape and width of spheroliths consequently indicates to the differential nodal liberation on the external surface. The average height and width of the spheroliths are found to be 1.56 mm and 0.64 mm respectively. The sweeping extinction pattern is observed in the examined radial sections.

**Growth Lines:** They are fairly domed upwards and track the outline of external profile. Tiny spheroliths are seen in between the bigger spheroliths.

**Pore and Pore canals:** It is observed that in the tangential sections, the pores are circular and elongated in shape and are seen along the contact between the nodes. The tapered, slanted and subvertical pore canals are noticed.

**Basal caps:** Subcircular or pentagonal basal caps appear as a flower and are packed compactly. They are found to be smaller in size than the ones found in *Megaloolithus cylindricus* i.e. about 0.15 – 0.5 mm in diameter. The interbasal space between individual ones and bunch of basal caps is hardly there. Very prominent and notable, large subcircular or triangular shaped pore openings occur between the basal caps in a few specimens. Properly set calcite spicules in the region of the basal core are positioned radially. The basal caps are not hollow. Digenetic amendment of silica might caused the demolition of some basal caps.

**Remarks:** The eggs which hailed from the oospecies, were at first reported from Jabalpur and Hathni river section (Kukshi) in India as Titanosaurid Type – II (Tripathi, 1986; Sahni, 1993; Sahni et al., 1994; Tondon et al., 1995). Eggshells found and gathered
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from Kukshi (1.2-1.6 mm) are not as thick as compared to the ones found in Dholiya (2.38 mm), otherwise they are alike (Sahni et al. 1994). An identical type, represented by spherical eggs and the diameter varying from 140-160 mm was earlier revealed from Waniawao, Panchmahal district (Mohabey and Mathur, 1989). A report from Joshi (1995) reveals that identical eggs have a diameter of 180 mm, were found near Bagh village.

The microstructure of the eggshell of the oospecies *Megaloolithus jabalpurensis* is like the microstructure seen in Penner Type 3, narrated from the upper Rognacian (Maastrichtian) of Aix - en - Provence basin, France (Penner, 1985). Eggshells of the same kind have also been described by Williams et al. (1984) and it has been represented by Type 3.1. Grigorescu (1993) and Grigorescu et al. (1994) gave an account of the same type of eggs of 120-160 mm in diameter and eggshells from Late Maastrichtian, Hateg Basin (Romania). Romanian eggshell thickness is found in the range of 2.1-2.7 mm and this is similar to that of *Megaloolithus jabalpurensis*. Vianey – Liaud et al., (1994) has described the oospecies *Megaloolithus mammilare* from the upper Rognacian (Maastrichtian) of Rousset - Erben locality, near La Begudae (Aix – en – Provence, Basin), above the Rognac limestone, France. Regarding the outer statue, the eggshell are more or less alike and the shape of the spheroliths resembles to Indian dinosaur eggshell oospecies *Megaloolithus jabalpurensis*. As compared to the French dinosaur eggshells, the general Indian dinosaur’s eggshell is found to be rather thicker.

DINOSAUR NESTING SITE

Preservation of dinosaur eggs is generally observed as a whole nest or as dispersed allocated fragments. A different set up of eggs with a clutch is called the nest which is a special biogenic frame work. An elevated portion around the eggs in some cases, depicts the margin of the nest. Rather than being found on trees as the modern birds, the eggs of dinosaurs were got on the earth, like a few modern reptiles and a few birds (i.e. penguins).
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Of over 200 fossil sites found throughout the world, which have capitulated remnants of mostly partial and unrecognized dinosaur eggs, only a small number of them have been given a satisfactory account on the nesting grounds. The world’s major and greatest widespread and extensive fossil hatcheries is epitomized by the dinosaur nesting and egg shell sites from the upper Cretaceous sedimentary sequences of the Indian subcontinents. Meticulous authentication of nesting sites in areas at Kheda, Dahod, the Hathni river and Jabalpur in western and central peninsular India, has been done ever since the early 1980s.

According to the studies done, of broadly preserved nesting sites in the late Cretaceous Lameta formation happening in central peninsular India in interrupted patches, concerned to the outcrop, nesting option and choices and nesting behavior have been obtained. Over a far ranging and widespread area, spanning 10000 km² and wherever so the Lameta formation is exhibited, the Sauropod nesting sites, isolated eggs, and egg shell fragments are dispersed. Abelisaurid Theropods have been associated with one and only site in Gujarat, excluding this other nesting sites have been ascribed to the Titanosaurid dinosaur.

The dinosaur eggs and nest fossils suggest a lot about their pattern of behavior and ways of laying eggs. Very complicated nests were built on mud, sand etc. or simple plane pits delved into the earth are noticed. They can appear singly or they make their appearance in huge groups. The nurturing behavior and mannerism of the dinosaurs is disclosed by the nests and clutches of eggs. The data related to in situ allocation of single or multiple egg bearing nests, burial and preservational conditions, paleoenvironments and paleoclimate is estimated by keen observation and measurement of different nesting sites. Few very thin egg shell fragments of Ornithoid dinosaurs (Sochava, 1969) were recognized while the bulk of nests belong to Titanosaurid Sauropods. It has been depicted, by the examination of their nests, that the dinosaur preferred the riverine sand to lay their eggs and buried them.

In the Lameta formation, in the vicinity of Padalya (Bagh) village in district Dhar of Madhya Pradesh, dinosaur eggs as well as nesting sites were observed and these were of the Titanosaurid Sauropod. Around 3 km North West of the ancient “Buddhist Bagh
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caves “ and 15 km from the Kukshi village on the Bagh- Kukshi road, the Padalya site (Lat.22° 20' N: 47° E) is situated. Being open on either side of the road, this site covers 89 hectares area. There is no exposure of Bagh Beds but only the Lameta formation is visible in Padalya. This section has yielded one complete egg, six partially broken dinosaur eggs and numerous eggshell fragments belonging to an oospecies *Megaloolithus Jabalpurensis*.

Some nesting sites were observed in Lameta formation of the study area (Padalya), showing space for either single egg or two eggs or for multiple eggs. One nesting site recorded by present author was much big, as it could lodge 12 dinosaur eggs, in addition to many single egg clutches. A few eggs have been found dislocated from their original nests, scattered in a vast region. This might be as a result of some changes in the climate or some anthropogenic activities which caused the rolling away of the eggs (Fig. 8.4 A-E).

**Characteristics of nesting sites:**

Dinosaur egg clusters found in various kinds of patterns and these have been called as nests. From the dinosaur egg sites in Mongolia, three typical types of nesting can be differentiated i.e. the first type is a specific nest built underground (hole) and the other two types of nests are setup up with sand or vegetation respectively and these are called mound nests (Mikhailov, et al. 1994). Two other kinds of nests on the basis of arrangement of eggs i.e. clutched (nest) and linear pattern were noticed and classified by Moratalla and Powell (1994). Moreover, a thought on how the eggs were dispersed into concentric circles, spirals or inverted cones, can be the basis for the subdivision of the clutch kind. In a number of varieties and arrangement of parallel rows or arcs, beget the linear type also, but in the present study area, no such geometrical pattern is observed. Hence this gives an indication that they were permitted to drop in an appropriate manner and allowed to lie where they alighted.

It is found that, just as in a nest, the size and shape of egg margins is more or less the same. Spherical shaped eggs are found usually in the present foregather and the size ranges from 9-18 cm in diameter. In Lameta limestone the egg embedded is alone or in
groups of 2 to 12 in number. Endowed with a clutch of 12 eggs, the biggest nesting site posses a diameter of 1.6 meters. The measurement of distance among two nests of the same surrounding is in 1 km. Now a day the calcified shells of the geckos (house lizard), crocodiles, turtle, and birds are made up in a different way (Bajpai et al., 1997 and Mohabey, 1987), likewise the eggshell structure of different group of dinosaurs differed from each other (Khosla and Sahni, 1995). The eggshell formation had around 6 - 9 varying structure pattern which could be traced back to the dinosaur or associated with the dinosaur. The above information was revealed by the investigations seen in the Indian fossil record around 67- 65 million years ago. About the huge herbivorousTitanosaur dinosaur, its eggshell structure is noticed and examined in the present work. Shells are made up of mineral calcite and are arranged as separate or coalesced units known as spheroliths. Addition of calcium carbonate to the shell structure is illustrated on spheroliths, has been demarcated by very much arched incremental lines. The growing embryos get oxygen through the pore canals.

In the Lameta formation, close to Bagh town areas, where the nesting site have been currently identified though the field work is continuously being done, workers have not noticed sites, in the horizon where in nests are reported along with eggs. Moreover, in the eggs embryos also have not been found, so far. Hence to find out the name of the parent creator is a difficult task indeed.

**Palaeoenvironments:**

Just akin to what the crocodiles and ostriches do now days, the nests of dinosaurs were placed on the ground, where ever the mud was smooth. They were also found on sandy soil which was close to the lakes and rivers (Sahni and Khosla, 1994). As a result of the weather, the soil is inclined to deterioration, the organic material is likely be liable to oxidized, decayed, battered and lost totally. The Late Cretaceous Indian dinosaurs laid their eggs on the surface of the soil and the soil was covered by lava flows like a blanket and was rapidly clogged, thus saving the nests and eggs from being corroded. This assumption of conservation of nests and eggs in this area is seems to be appropriate, as this area is mostly coupled with the Deccan volcanic activities. The appearance of eggs in
Tamil Nadu suggests that, there is exclusion to this regulation, where there are records of vitric tuffs but not for basaltic flows. At a time, when there was an intense and massive environmental trauma going because of the volcanic activity, it was quit probable for us to assume logically whether the eggs were being hatched into feasible or sustainable hatchlings or not. There is re-absorption of calcium from underneath the eggshell in growing process of an embryo. Two conditions came to light, when the scanning electron microscopic examination of this surface was done. The conditions are

1. Examination by scanning electron microscopy of underside of egg reveals that a hatching of a viable offspring had taken placed from the dissolute area.

2. The other situation gave us the assumption for an aborted embryo, where not much of dissolution is visible.

The second assumption in terms of geological situations which were present there during that time seems to be more acceptable. The coarse gravel and pebbles accompanying the nests, gave us the confirmation of the incidence of ample nests in “flood plain” environments.

There is possibility that the stagnant water may have blocked the distribution of oxygen to the developing embryos and this resulted in the death of the embryos, while the outer calcified shell was preserved.

The dinosaurs could not withstand and live through the catastrophic disaster called as the Cretaceous – Tertiary boundary (KTB), a bulk extermination activity for them occurred, which might have been occurred around 65 million years ago. This age implies a unique and makeable age with reference in Indian milieu – context, because it is related to such an activity which reaches the highest point in the volcanic eruptions of the Deccan, but it also falls together and concurs with Chicxulub impact crater in the Central Americas. These events have definitely had a hand in the worsening of climate and environment, although these incidents did not take place at the same time but this resulted in the ruin and demolition of almost 65 to 70 % of life on earth. Luckily for the human clan, most of the mammals persisted fortunately, developing and radiating into various pedigrees and even the primates. A short scale episode was witnessed only after a small
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period of the KTB, by the Indian landmasses which was drifting and as a result of this; there was incursion of marine waters into the Narmada and Godavari rift systems (Keller et al. 2009). Thus a new world of mammals was created, replacing the old order of the dinosaurs slowly and steadily.

DISCUSSION

Unusual and special is the occurrence of Indian dinosaur remains in the sediments due to various reasons. A clear explanation regarding their emergence in the sediments is connected with the volcanic activities which took place in the Deccan and an immense outburst of basaltic lava flows at continental scale. With the Deccan volcanic activity, the toxic volcanic gases arose. Therefore the two prime causes viz. volcanic lava flow and immense pollution by the toxic gases might be responsible for the degradation of the environment. All this in turn, lead to the extinction of dinosaurs life on a huge scale. In the unexpected spreading of lava flows, there was a positive site too, which was that, this prevented their erosion and aided in preserving the sediments where the dinosaurs nested.

Below the Deccan basaltic flows, nests and eggs have been noticed in sediments (Lameta formation). In addition other sediments, intertrappeans are located in an intervene way amidst the flows. These two are two entirely contradictory set ups and it seems that no age difference exists between these two sediments. The position just only throws light on the different position of the snout with moving lava flow (Sahni, 1994). The Beds in which the eggs and nests come into being are assumed to be about 67 - 65 million years depending on the attributed invertebrate and vertebrate fossils and also the pollen data. The facts that, even during those comparatively short spell of volcanic quiescence, the Indian dinosaurs flourished along river beds and lakes.

The present work includes detail examination of the eggs and nesting sites, author recognized single oospecies *Megaloolithus jabalpurensis* which revealed the absence of embryos or associated juveniles, thus it is not possible to relate the Indian Sauropod eggshells and nests to any Titanosaurid species. Fairly widespread nesting sites with morphologically identical eggs provide strong proof for colonial nesting by the Lameta Sauropods. Besides, the wide geographic distribution of the nesting sites in lithologically,
similar horizon points out, site selectivity by these dinosaurs and it specifies that the
dinosaurs kept returning to the same location for nesting.

Fragmentary egg shells are copious and rampant (Sahni, 1993; Sahni et al., 1994;
Khosla and Sahni, 1995) and several hundred nests with 3-13 eggs and several thousand
Mohabey and Udhoji, 1996; Mohabey et al., 1993; Joshi, 1995) are found all over the east
central Narmada river region. Their noteworthy and unusual, numerical allocation and in
which manner it may throw back its reflection on the original dinosaur population
density is a question which arises. The conserved dinosaur eggs might signify for a single
or multiple laying activities, on the same surface, thereby increasing their density in nest.
The possible correlation of buried nests to unhatched eggs could be obscured due to
flooding or it may also be possible that the fragments of eggs are visible after the
hatching of eggs. The egg shell fragments may be as a result consequence of either
hatched or unhatched categories. In spite of deficient associated fossil bones, the
paleontologists could assume the probability that the eggs were of Sauropod dinosaurs.