

ROCK MAGNETIC PROPERTIES OF SOUTHERN MEXICO BEACH SANDS: IMPLICATIONS FOR HOMING AND NESTING OF MARINE BLACK TURTLES

ALMA LILIA FUENTES-FARIAS^{1,2}, Jaime Urrutia-Fucugauchi², Gabriel Gutierrez-Ospina³,
Ligia Perez-Cruz² and Victor Garduno-Monroy⁴

¹ Facultad de Biología, Universidad Michoacana de San Nicolás de Hidalgo, Morelia
Michoacán, México

² Instituto de Geofísica, Universidad Nacional Autónoma de México, México

³ Instituto de Investigaciones Biomédicas Universidad Nacional Autónoma de México, México

⁴ Instituto de Investigaciones Metalúrgicas, Universidad Michoacana de San Nicolás de
Hidalgo, Morelia Michoacán, México

It has long been suggested that marine turtles may use parameters of the earth's magnetic field for open ocean navigation and to broadly locate their natal beaches. Accurate location may then require short-range indicators, perhaps including magnetic cues to refine geographical position once within their natal areas. It remains however uncertain whether natal beaches indeed display short-range magnetic features. Here we present initial results on the characterization of nesting and non-nesting beaches in terms of magnetic properties of their sands. The coast of Michoacan, southern Mexico constitutes one of the main nesting areas of the marine black turtle *Chelonia agassizi* and we evaluate and compare magnetic features of non-natal (La Ticla and La Llorona) and natal beaches (Colola and Maruata). Values of inclination, declination, total intensity and vertical intensity of the earth's magnetic field are lower for Colola and Maruata than for La Ticla and La Llorona. Horizontal intensity is higher for Colola and Maruata. Secular variation rates for all beaches studied are similar. Analyses of magnetic and geological charts reveal presence of magnetic anomalies with values above 350 nanoTeslas for Maruata beach, associated with a large intrusive body that supplies ferromagnetic sediments rich in magnetite to Maruata. Sand samples of Maruata display the highest values of natural remanent magnetization and magnetic susceptibility. Magnetic hysteresis parameters allow further characterization of magnetic environments among and within nesting and non-nesting beaches. These features might have implications for nest selection in the context of magnetic orientation mechanisms.

rock magnetism, biomagnetism, marine turtles

Alma Lilia Fuentes-Farias, Facultad de Biología, Edificio R, Universidad Michoacana de San
Nicolás de Hidalgo, Morelia Michoacan, 58060 Mexico