

Guest Editorial: The Oldest Place Where There is Always Something New

J.G. Frazier

Conservation and Research Center, National Zoological Park, Smithsonian Institution,
1500 Remount Road, FrontRoyal, Virginia 22630, USA (E-mail:kurma@shentel.net)

Semper aliquid novi Africam adferre
(often quoted as ‘*Ex Africa semper aliquid novi*’)

“Africa always brings something new.”
Pliny the Elder 23-79 CE: *Historia Naturalis*

There is so much that is incredible about Africa that there is always something new to be discovered – particularly for those who think of this vast, diverse land mass as just some other place. The second largest of continents, delimiting the south eastern border of the Atlantic Ocean, the western shores of the Indian Ocean, the western side of the Red Sea, and the southern coast of the Mediterranean Sea, the African region also includes major island territories in the eastern Atlantic and the western Indian Ocean. All told, this vast region includes 54 sovereign States, as well as territories administered by four European nations, with a tremendous diversity of cultures, languages, religions, environments, and wildlife. Hence, Africa represents many unique things to specialists in marine turtles.

The history of marine turtles in Africa is exceptional: the oldest known evidence of human-turtle interactions comes from this continent. Eight marine turtle bones were identified from excavations at Sibudu Cave, KwaZulu, South Africa, and dated from the Middle Stone Age, estimated to be between 49,000 and 50,000 BP (Plug 2004; *in litt.* 5 March 2007). The oldest known artifacts of tortoise-shell, from the Badarian and Naquada II Periods, about 5,200 to 6,000 years ago, were found as grave goods in Egypt (Andrews 1981; Needler 1984). Queen Hatsheput’s expedition to Punt is thought to have brought tortoise-shell back to Egypt nearly 3,500 years ago (Hourani 1995), so the trade and use of this commodity, at least in some parts of Africa, dates back to ancient times.

The account of Agatharchides of Cnidus from the third century BCE includes descriptions of enormous turtles being caught, pulled onto shore, cooked in the sun, and used in diverse ways by “turtle eaters” (*Chelonophagi*), a primitive group of people who lived on islands, apparently in the southern extreme of the Red Sea (Burstein 1989). An enigmatic manuscript from the time of Christ known as the *Periplus Maris Erythraei* gives detailed instructions on trading in Africa and elsewhere in the Indian Ocean, and tortoise-shell is the most frequently mentioned commodity (Mathew 1975; Casson 1989). During ancient times, traders and explorers from Egypt, Arabia, and China sought the coasts of East Africa in search of various goods, notably tortoise-shell that was highly valued and traded in a well-developed and wide-ranging network (Al-Mas’udi in Freeman-Grenville 1962; Trimmingham 1975; Wheatley 1975). So important were marine turtles to regional trade that these reptiles, and particularly their shell, may have been essential exchange items for societies in the Comoro Islands more than 1,000 years ago to obtain imported ceramics (Wright 1984).

Today we know that five species of marine turtles nest in the African region, which provides globally and regionally important nesting beaches for four of these reptiles. One of the largest nesting

aggregations of *Dermochelys coriacea* in the world was recently discovered in Gabon (Fretey & Girardin 1988). Island States in the western Indian Ocean, Reunion and Seychelles in particular, have some of the world’s largest nesting aggregations of *Chelonia mydas*, namely on Europa and Tromelin islands and Aldabra Atoll; and the large nesting aggregations on Ascension Island and Guinea Bissau are of great regional importance (Seminoff 2004). The nesting of *Eretmochelys imbricata* in the granitic Seychelles is also of global importance (Meylan and Donnelly 1999). Large nesting aggregations of *Caretta caretta* on Cape Verde are important for the East Atlantic (Fretey 2001). Rapid surveys in eastern Libya found nesting by this species in numbers that are relatively large for the Mediterranean (Laurent et al. 1997), and although there is no accurate estimate for this area (Venizelos et al. 2005), it seems that the Libyan coast may host important nesting beaches for this species in the Mediterranean Sea (Hamza *in litt.* 8 March 2007; Margaritoulis *in litt.* 9,10 March 2007).

Both *C. caretta* and *D. coriacea* from eastern South Africa can cross into the Atlantic (e.g., Luschi et al. 2006). In addition, there are two lines of genetic evidence for movement of *C. mydas* between Indian and Atlantic Oceans: DNA sequence variants, or haplotypes, typical of Indian Ocean rookeries are also found in foraging turtles in the eastern Atlantic (Formia 2002), and haplotypes typical of Atlantic rookeries are also found in turtles from Indian Ocean rookeries (Bourjea et al. 2007). Hence, although the African continent separates the Atlantic and Indian Oceans, some turtles seem to be able to move freely around its southern tip, traversing from one ocean to another.

To this list of notable prehistoric, historic, and biological attributes must be added other critical aspects relevant to understanding marine turtle populations and the integration of society with research and conservation initiatives. One of the challenges with marine turtle research – world wide – is being able to understand the tremendous variations that occur from year to year, season to season, and place to place. Long-term monitoring provides a unique means for evaluating the status and trends of the populations of these slow-maturing, long-lived, complex reptiles. Remarkably, the longest monitoring programs for *C. caretta* and *D. coriacea* – anywhere – are still active after more than four decades in Kwa-Zulu, South Africa (Hughes 1996; *in litt.* 12 March 2007). Also of global importance are the monitoring programs carried out on several islands in the Seychelles. Of note is the monitoring of *E. imbricata* on Cousin Island, Seychelles, that has been going on since 1970 (Mortimer and Bresson 1999); surveys of *C. mydas* nesting on Aldabra Atoll were begun in the late 1960s, and there has been continual monitoring on the Atoll – if with varying intensity – since the end of 1980 (Mortimer et al. 2006).

The integration of community-based conservation and community development with research and conservation initiatives is essential for effective work with marine turtles (Frazier 2005), and this approach is actively pursued in several African countries. On the

Atlantic coast there are many emerging projects that directly involve communities, such as in Cameroon, Sao Tomé & Príncipe (Fretey 2004), and Benin (Dossou-Bodjrenou et al. 2003; 2005). On the Indian Ocean coasts there are well-developed community-based projects in countries such as Kenya (Okemwa et al. 2004; Zanre 2005; Nuzuki 2006) and Tanzania (Muir 2004; Muir and Abdallah 2006). Especially encouraging is the work going on in French-speaking islands of the western Indian Ocean, where professionally trained social scientists are working with coastal communities as central components of turtle conservation programs. The detailed ethnographic studies of Lilette (2002; 2006) will strengthen the development of integrated conservation and development activities in western Madagascar and Comores; and these should help set the scene for similar work throughout the region and globally.

At the other end of the political scale are international negotiations and instruments. The first multilateral environmental agreement to come into effect that is focused specifically on marine turtles is the Memorandum of Understanding Concerning Conservation Measures for Marine Turtles of the Atlantic Coast of Africa, and all but one African State on the Atlantic coast (South Africa) is signatory to this MoU. On the other side of the continent, more than half of the States on the eastern coast of Africa are signatories to the sister agreement, the Memorandum of Understanding on the Conservation and Management of Marine Turtles and Their Habitats of the Indian Ocean and South-East Asia (IOSEA) – the most active and advanced of the international instruments focused on marine turtles.

Clearly, there is a growing need to compile and synthesize the diverse and burgeoning information on marine turtles in Africa. After two monographic works on western Africa (UNEP/CMS 2000; Fretey 2001), an important step was taken four years ago in the Marine Turtle Newsletter (Formia et al. 2003), and this special issue of the MTN – dedicated completely to Africa – is a much-needed advance, thanks to the forethought and efforts of MTN editors Matthew Godfrey and Lisa Campbell, and the invited guest editors Manjula Tiwari, Angela Formia, Sue Ranger, and Jacques Fretey. Papers in this special issue include not only new and interesting information, but some intriguing approaches to the study and conservation of marine turtles that have immediate relevance to other parts of the world.

As expected, there are many and diverse threats to marine turtles in this vast region. Intense exploitation of eggs and turtles is widespread, as is bycatch in various fisheries. In Cote d'Ivoire – which may be typical of much of the western coast of Africa – several nesting beaches have nearly 100% egg take, with intense exploitation on nesting females; and not surprisingly, local residents report a decline in nesting numbers. There are diverse initiatives at public education and building awareness for the need to conserve marine turtles, and most prominent are those that include community development projects, particularly by engaging former turtle hunters as well as other community members in alternative livelihood activities. Help with community shops and the commercialization of copra have been especially effective at encouraging collaboration in turtle conservation (Gómez Peñate et al. 2007).

Bal and collaborators (2007) explain the value of having a full-time presence on nesting beaches in order to reduce intense, uncontrolled egg take and killing of nesting females in the Republic of Congo. They also describe an innovative project in which artisanal fishermen were encouraged to release accidentally captured turtles,

and in turn provided with materials to mend their nets. Even though the fishermen received no compensation for lost fishing time, the project resulted in the release of more than 1,300 turtles during the first year. Nonetheless, there are still enormous problems from mechanized trawlers, and particularly fishing activities conducted by Asian companies in this and other countries in western Africa.

Interviews, surveys, and direct observations with fishermen from Benin, Ghana, and Togo confirmed the importance of incidental capture of marine turtles in various types of fishing nets. While there is thought to be no directed take, turtles that are incidentally caught are commonly killed, either by drowning or purposeful slaughter by fishermen who make use of the catch for meat, oil, and shell as other marine resources decline in abundance (Dossa et al. 2007). Elsewhere in western Africa large numbers of turtles are known to strand on vast beaches, for example in southern Gabon and northern Congo. Interactions with fisheries are thought to be a major source of mortality, and cadavers of *Lepidochelys olivacea* have been most common, but *D. coriacea* and *C. mydas* are also recorded (Parnell et al. 2007).

The problem of light pollution and disorientation of turtles is given a new twist with the paper by Deem and collaborators (2007), who studied *D. coriacea* on the world famous Pongara nesting beach, Gabon. Not only are countless thousands of hatchlings disoriented, heading inland from the beach toward artificial lights of the fast-growing resort area at Pointe Denis, some 11 km south of Libreville, but between 2% and 56% of the females nesting on any night may be disoriented and head inland, rather than down the beach to the sea. The immediate effects of light pollution are addressed with all-night guardians who lure post-nesting females to the sea with lights, and a long-term solution is being sought to reduce or eliminate the light disturbance.

Weir (2007) provides a useful account on the issue of seismic airguns and what effect they might have on marine turtles. While her study is focused on the waters of Angola, the information is both globally relevant and timely, for this technology is becoming more common in oil exploration, and there is very little documented about its impacts on marine wildlife, particularly turtles. Given the world situation regarding oil supplies and resources, and especially the increased activity in offshore oil exploration, there have been recurrent concerns about the impacts that these activities may have on marine turtles. It is clear from Weir's study that there is an enormous lack of basic information on the effects of oil exploration on marine turtles, and she provides useful suggestions for future work on this issue. In this context it is important to point out that oil exploration and exploitation has increased dramatically over the past decade in the Gulf of Guinea and as new reserves are discovered in places like Equatorial Guinea, São Tomé and Gabon, there will be ever increasing threats to areas used by marine turtles for nesting, foraging, and migrating.

External tumors may occur on nearly a fifth of the *C. mydas* captured in Corisco Bay, an important feeding ground on the border between Equatorial Guinea and Gabon. Histopathological analysis of tumors from one juvenile confirmed fibropapillomatosis for the first time in western Africa, a disease known to present a serious health problem to *C. mydas* in other parts of the world (Formia et al. 2007).

Fretey and colleagues (2007) provide additional information on the use of marine turtles and their parts in “pharmacopeias” of

western Africa. They list an intriguing variety of turtle parts that are employed, including eggs, meat, heart, liver, penis, oil, blood, skulls, powdered skulls, carapaces, bones, and claws. A remarkable diversity of remedies and beliefs are described, involving uses as cures for diverse ailments, aphrodisiacs, charms and even taboos. In some ethnic groups, marine turtles are to be avoided or even revered and protected. For example, the Adan of Ghana worship marine turtles, and routinely release these animals if caught. The article clearly shows the cultural importance of marine turtles in this vast, diverse geographic region, and emphasizes the need for turtle biologists and conservationists to be well informed about, and sensitive to, local cultures. This message is of critical importance – throughout Africa, and elsewhere.

Information on long distance movements and migrations through tag returns shows that turtles can disperse widely along the Atlantic coast of Africa, and moreover that some individuals in western Africa also live in eastern South America. Not only does *D. coriacea* live on both sides of the south Atlantic and migrate between the southeastern and the southwestern Atlantic (Billes et al. 2006), but these turtles also disperse down the western coast of Africa from the equator to as far as South Africa (Fretey et al., 2007).

No less remarkable are records of *E. imbricata* tagged in Brazil being recaptured off the coast of western Africa. The third case of transatlantic hawksbill migration is also the second record of this species moving from Fernando de Noronha, Brazil, to Corisco Bay (Grossman et al. 2007). Tagged as a juvenile, the female moved more than 4,600 km point-to-point, between release and recapture sites, and this record underscores the fact that various species of marine turtles – including hawksbills – can cross ocean basins. Despite initial impressions, the leatherback and the hawksbill turtles reported in this special issue were not Gabonese or Brazilian; they – like most other marine turtles – were international animals, common property, involving the rights and responsibilities of many societies and governments around the world (Frazier 2004).

The selection of diverse studies in this special issue of the MTN, from the Atlantic and Indian Ocean coasts of Africa shows that there have been recent advances in numerous directions regarding marine turtles. Yet, there is much to do, not only focused on the turtles, but especially on critical activities such as commercial and artisanal fishing, coastal development, and marine and land-based pollution. Moreover, the most complex, but fundamental dilemmas that ultimately impact the status of marine turtles and their habitats over this vast area are questions of governance, security, civil rights, and poverty. Remarkably, work focused on marine turtle research and conservation in Africa is helping to understand and alleviate these immense social problems, and lead the way regionally and globally in the integration of conservation with community development and other human rights issues. Indeed, there will always be something new in Africa!

Acknowledgements: Countless people from many walks of life, from scores of countries, have dedicated enormous efforts to understand and conserve marine turtles and their habitats across the vast African region; A. Formia, D. Margaritoulis & M. Tiwari made useful comments on earlier drafts.

ANDREWS, C.A.R. 1981. Catalogue of Egyptian antiquities in the British Museum. VI Jewellery I from the earliest times to the Seventeenth Dynasty. British Museum Publications Limited; London. 102 pp.

BAL, G., N. BREHERET & H. de VANLEEUE. 2007. An Update on

Sea Turtle Conservation Activities in the Republic of Congo. Marine Turtle Newsletter 116: 8-9.

BILLES, A., J. FRETEY, B. VERHAGE, B. HUIJBREGTS, B. GIFFONI, L. PROSDOCIMI, D. A. ALBAREDA, J.-Y. GEORGES & M. TIWARI. 2006. First evidence of leatherback movement from Africa to South America. Marine Turtle Newsletter 111: 13-14.

BOURJEA, J., S. LAPÈGUE, L. GAGNEVIN, D. BRODERICK, J. A. MORTIMER, S. CICCIONE, D. ROOS, C. TAQUET & H. GRIZEL. 2007. Phylogeography of the green turtle, *Chelonia mydas*, in the Southwest Indian Ocean. Molecular Ecology 16: 175-186.

BURSTEIN, S. M. 1989. *Agatharchides of Cnidus: On the Erythraean Sea*. Hakluyt Society; London. xii + 202 pp.

CASSON, L. 1989. *The Periplus Maris Erythraei*. Princeton University Press; Princeton, New Jersey. xvii + 320 pp.

DEEM, S.L., F. BOUSSAMBA, A.Z. NGUEMA, G.-P. SOUNGUET, S. BOURGEOIS, J. CIANCIOLO & A. FORMIA. 2007. Artificial lights as a significant cause of morbidity of leatherback sea turtles in Pongara National Park, Gabon. Marine Turtle Newsletter 116: 14-16.

DOSSA, S.J., A.B. SINSIN & A.G. MENSAH. 2007. Conflicts and social dilemmas associated with the incidental capture of marine turtles by artisanal fishers in Benin. Marine Turtle Newsletter 116: 10-11.

DOSSOU-BODJRENOU, J., P. SAGBO, J. MONTCHO, A. MAMA & S. TCHIBOZO. 2003. Education strategy for sustainable sea turtle conservation in Benin (West Africa). In: J.A. Seminoff (Comp.). Proceedings of the 22nd Annual Symposium on Sea Turtle Biology and Conservation. NOAA Tech. Mem. NMFS-SEFSC-503. pp. 177-179.

DOSSOU-BODJRENOU, J., J. MONTCHO & P. SAGBO. 2005. Challenges and prospects for sea turtle conservation in Benin West Africa. In: M.S. Coyne and R.D. Clark (Comps.). Proceedings of the 21st Annual Symposium on Sea Turtle Biology and Conservation. NOAA Tech. Mem. NMFS-SEFSC-528. pp. 120-122.

FORMIA, A. 2002. Population and genetic structure of the green turtle (*Chelonia mydas*) in West and Central Africa; implications for management and conservation. PhD Thesis, Cardiff Univ, 270 pp.

FORMIA, A., M. TIWARI, J. FRETEY, and A. BILLES. 2003. Sea turtle conservation along the Atlantic coast of Africa. Marine Turtle Newsletter 100: 33-37.

FORMIA, A., S. DEEM, A. BILLES, S. NGOUESSONO, R. PARNELL, T. COLLINS, G.P. SOUNGUET, A. GIBUDI, A. VILLARUBIA, G. H. BALAZS & T.R. SPRAKER. 2007. Fibropapillomatosis confirmed in the Gulf of Guinea, West Africa. Marine Turtle Newsletter 116: 20-22.

FRAZIER, J. 2004. Marine turtles: whose property? Whose rights? "The commons in an age of global transition: challenges, risks and opportunities." Presented at the Tenth Conference of the International Association for the Study of Common Property, Oaxaca, Mexico, August 9-13. <http://dlc.dlib.indiana.edu/archive/00001388/00/Frazier_Marine_040531_Paper547b.pdf>

FREEMAN-GRENVILLE, G. S. P. 1962. The East Africa Coast: Select documents from the first to the earlier nineteenth century. Clarendon; Oxford. xi + 314 pp.

FRETEY, J. 2001. Biogeography and conservation of marine turtles of the Atlantic coast of Africa. CMS Technical Series Publication No. 6.

FRETEY, J. 2004. Helping communities to save turtles in Africa. Unpublished ms; UICN-France, Laboratoire d'Evolution, Muséum national d'Histoire naturelle, Paris. 5 pp.

FRETEY, J. & N. GIRADIN. 1988. La nidification de la tortue luth, *Dermochelys coriacea* (Vandelli, 1761) (Chelonii, Dermochelyidae) sur les côtes du Gabon. *Journal of African Zoology* 102: 125-132

- FRETEY, J., A. BILLES, B. BAXTER & C. HUGHES. 2007. Discovery of a Gabonese leatherback in South Africa. *Marine Turtle Newsletter* 116: 25-26.
- FRETEY, J., G. H. SEGNIAGBETO & M. SOUMAH. 2007. Presence of sea turtles in traditional pharmacopoeia and beliefs of West Africa. *Marine Turtle Newsletter* 116: 23-25.
- GÓMEZ PEÑATE, J., M. KARAMOKO, S., BAMBA & G. DJADJI. 2007. Marine turtles of Cote D'Ivoire, West Africa. *Marine Turtle Newsletter* 116: 6-7
- GROSSMAN, A., C. BELLINI, A. FALLABRINO, A. FORMIA, J. MBA MBA, C. EPOTA NASSAU, J. NZI MBA & C. OBAMA. 2007. Second TAMAR-tagged hawksbill recaptured in Corisco Bay, West Africa. *Marine Turtle Newsletter* 116: 26.
- HOURLANI, G. F. 1995. Arab seafaring in the Indian Ocean in ancient and early medieval times (J. Carwell ed.) Princeton, New Jersey, Princeton University Press. xvii + 189 pp.
- HUGHES, G. 1996. Nesting of the leatherback turtle (*Dermochelys coriacea*) in Tongaland, Kwa-Zulu-Natal, South Africa, 1963-1995. *Chelonian Conservation and Biology*. 2: 153-158.
- LAURENT, L., M. N. BARDAI, D. A. HADOUD & H. M. EL GOMATI. 1997. Assessment of sea turtle nesting activity in Libya. *Marine Turtle Newsletter* 76: 2-6.
- LILLETTE, V. 2002. Contextes socio-anthropologiques del'exploitation de la tortue verte aux Comores et à Madagascar : les enjeux de sa conversation. *Journal of Nature/Le Journal de la Nature (Université de La Réunion)* 14: 27-34.
- LILLETTE, V. 2006. Mixed results: Conservation of the marine turtle and the red-tailed tropic bird by Vezo semi-nomadic fishers. *Conservation and Society* 4: 262-286.
- LUSCHI, P., J. R. E. LUTJEHARMS, R. LAMBARDI, R. MENACCI, R., G. R. HUGHES & G. C. HAYS. 2006. A review of migratory behaviour of sea turtles off southeastern Africa. *South African Journal of Science*. 102: 51-58.
- MATHEW, G. 1975. The dating and significance of the *Periplus of the Erythrean Sea*. Pp. 147-163. In: H. N. Chittick and R. I. Rotberg (eds.) *East Africa and the Orient: Cultural syntheses in Pre-colonial times*. Africana; New York.
- MEYLAN, A. B. & M. DONNELLY. 1999. Status justification for listing the hawksbill turtle (*Eretmochelys imbricata*) as critically endangered on the 1996 *IUCN Red List of Threatened Animals*. *Chelonian Conservation and Biology* 3: 200-224.
- MORTIMER, J.A. & R. BRESSON, 1999. Temporal distribution and periodicity in hawksbill turtles (*Eretmochelys imbricata*) nesting at Cousin Island, Republic of Seychelles, 1971-1997. *Chelonian Conservation and Biology* 3: 318-325.
- MORTIMER, J.A., T. JUPITER, J. COLLIE, R. CHAPMAN, A. LILJEVIK, B. BETSY, R. PIMM, J. STEVENSON, V. LABOUDALLON, M. ASSARY, W. SEABROOK, D. AUGERI & S. PIERCE. 2006. Trends in the green turtle (*Chelonia mydas*) nesting population at Aldabra Atoll, Seychelles (Western Indian Ocean) and their implications for the region. Pp. 75-77. In: Pilcher, N. (compiler). *Proceedings of the Twenty-Third Annual Symposium on Sea Turtle Biology and Conservation*. NOAA Tech. Memo. NMFS-SEFSC-536.
- MUIR, C.E. 2004. An assessment of the status of turtles, dugongs and cetaceans in Mnazi Bay-Ruvuma Estuary Marine Park and recommendations for a conservation strategy. IUCN EARO, Nairobi. vi + 59 pp.
- MUIR C.E. & ABDALLAH, O. 2006. Community-based conservation of sea turtles at Mafia Island, Tanzania. Pp. 79-81, In: Pilcher, N. (compiler). *Proceedings of the Twenty-Third Annual Symposium on Sea Turtle Biology and Conservation*. NOAA Tech. Memo. NMFS-SEFSC-536.
- NZUKI, S. (ed.) 2006. Enhancing the conservation and management of sea turtles in Kenya. Report to UNDP/GEF Small Grants Project. 81 pp.
- NEEDLER, W. 1984. *Predynastic and Archaic Egypt in the Brooklyn Museum*. (Wilbour Monographs IX) The Brooklyn Museum; New York. 460 pp.
- OKEMWA, G.M., S. NZUKI & E.M. MUENI. 2004. The status and conservation of sea turtles in Kenya. *Marine Turtle Newsletter* 105: 1-6.
- PARNELL, R., B. VERHAGE, S. L. DEEM, H. VAN LEEUWE, T. NISHIHARA, C. MOUKOULA & A. GIBUDI. 2007. Marine turtle mortality in southern Gabon and Northern Congo. *Marine Turtle Newsletter* 116: 12-14.
- PLUG, I. 2004. Resource exploitation: animal use during the Middle Stone Age at Sibudu Cave, KwaZulu-Natal. *South African Journal of Science* 100: 151-158.
- SEMINOFF, J. A. 2004. MTSG global assessment of green turtles for the IUCN Red List. <http://www.iucn-mtsg.org/red_list/cm/MTSG_Chelonia_mydas_Assessment_April-2004.pdf>
- TRIMMINGHAM, J. S. 1975. The Arab geographers and the East African coast. Pp. 115-146. In: H. N. Chittick and R. I. Rotberg (eds.) *East Africa and the Orient: Cultural syntheses in Pre-colonial times*. Africana; New York.
- UNEP/CMS. 2000. Conservation Measures for marine turtles of the Atlantic coast of Africa. CMS Technical Series Publication No. 5.
- VENIZELOS, L. K. PAPAVALOU, M.-A. DUNAIS & C. LAGONIKA. 2005. A review and reappraisal of research in some previously unsereveyed Mediterranean marine turtle nesting sites, 1990-2001. *Belgian Journal of Zoology* 135: 271-277.
- WEIR, C. R. 2007. Observations of marine turtles in relation to seismic airgun sound off Angola. *Marine Turtle Newsletter*. 116: 17-20.
- WHEATLEY, P. 1975. *Analecta Sino-Africana Recensa*. Pp. 76-114. In: H. N. Chittick and R. I. Rotberg (eds.) *East Africa and the Orient: Cultural syntheses in Pre-colonial times*. Africana; New York.
- WRIGHT, H. T. 1984. Early Seafarers of the Comoro Islands: the Dembeni Phase of the IXth-Xth Centuries AD. *Azania: Journal of the British Institute in Eastern Africa* 19: 12-59.
- ZANRE, R. 2005. Report on Watamu Turtle Watch's sea turtle bycatch release programme, Watamu, Kenya. April 1998 – May 2004. 95 pp. <http://www.watamuturtles.com/reports/WTW_BYCATCH_RELEASE_REPORT.pdf>