

Rodolfo Fattovich

## **The Afro-Arabian circuit: contacts between the Horn of Africa and Southern Arabia in the 3rd - 2nd millennia B.C.**

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The occurrence of contacts between the populations of the Horn of Africa and Southern Arabia in proto-historical times has intrigued scholars since the very beginning of Ethiopian studies because of its relevance for the origins of the Ethio-Semitic speaking peoples (e.g. Ludolf 1682). This problem has been investigated mainly by historians and linguists (Brandt & Fattovich 1990). They stressed the indisputable relationship between the Ethiopian-Semitic languages and South Arabic (Ullendorff 1955; Moscati 1960; Hetzron 1972; Garbini 1984), usually explaining it through movements of people from Arabia to Ethiopia in late prehistoric and/or early historic times (Glaser 1895; Conti-Rossini 1928; Ullendorff 1973). Various hypotheses have been suggested so far:

- a. migration of whole tribes from SW Arabia to the Tigrean plateau (Tigrai and Eritrea) in late prehistoric times (Ludolf 1682; Glaser 1895);
- b. Sabean colonization of the plateau in the early 1st millennium B.C. (Bent 1893);
- c. progressive South Arabian expansion along the coast and onto the plateau in late prehistoric times and successive Sabean colonization of the plateau in early historical times (Conti-Rossini 1928; Ricci 1984);
- d. emergence of an Afro-Arabian linguistic *koinè* in late prehistoric and early historical times (Marrassini 1985; Avanzini 1989).

Most linguists agree that Proto-Ethiopian originated through contact between one group of South Semites, which settled on the Tigrean plateau, and local Cushitic populations (Ullendorff 1955; Hetzron 1972). According to Garbini (1984: 153ff.) different South Semitic peoples were involved in this process. A few scholars have emphasized a possible diffusion of the Semitic languages from Ethiopia to the Near East since Late Palaeolithic times (see Hudson 1977; 1978), but this hypothesis is not supported by any concrete evidence.

The existence of strong ancient links between the opposite regions of the southern Red Sea is also suggested by Ethiopian and Arab sources. A late prehistoric South Arabian migration into Ethiopia is mentioned by some Ethiopian sources. According to Gabra-Mariam (1987), for example, three tribes (Saba, Abal and Ofir) came to Ethiopia from Yemen. Initially they settled in the Tigray as traders subject to the local king, then they separated, occupying respectively the Tigray (Saba), Adal (Abal) and Wigadin (Ofir). Other sources stress, on the contrary, a movement from Ethiopia to Yemen (see Giyorghis 1987).

The Arab sources, in turn, point to the emergence of a multi-ethnic society along the coastal region of the Hijjaz, Yemen and Hadramawt, from Jedda to Mukalla, and the opposite African coast in pre-Islamic times (Norris 1978). Late prehistoric contacts between the two regions might be inferred, as well, from the use of a very archaic type of camel saddle with South Arabian origin in Somalia and Socotra. It might suggest that the camel was introduced into the Horn from Southern Arabia in quite early times, perhaps between 2500 and 1500 B.C. (Bulliet 1975). Finally, the existence of a very ancient interchange circuit connecting the Horn to the southern Arabian Peninsula and India is suggested by the African, mainly Ethiopian, origin of many Indian plant cultivars (Possehl in press; Mehra in press; Saraswat 1991). This is confirmed by the discovery of domestic sorghum with African origin in an assemblage dated to the mid 3rd millennium B.C. at Hili, Abu Dhabi Emirate (Cleziou & Costantini 1980).

The archaeological evidence of contacts between the Horn and Southern Arabia before the 1st millennium B.C. is still quite scarce. Until a few years ago it was supported only by some similarities in the rock art of both regions (Cervicek 1979). In the 1980's fresh data was provided by the investigations carried out along the Saudi and Yemeni Tihama and northern Yemeni plateau by the Saudi-American Comprehensive Archaeological Survey and the Italian Archaeological Mission to Northern Yemen (Zarins et al. 1981; Zarins & Zahrani 1985; Zarins & Albadr 1986; de Maigret et al. 1984; de Maigret 1990; Tosi 1986) and in the Eastern Sudan by the Italian Archaeological Mission to the Sudan Kassala (Fattovich 1991).

The preliminary results of these investigations, combined with a review of the previously collected data, confirm that contacts and most likely exchanges between the peoples of the Horn, including the northern Ethio-Sudanese lowlands, and Southern Arabia started in the 7th millennium B.C. and were firmly established in the 3rd-2nd millennia B.C. (Fattovich in press).

At present it seems that an interregional trade of obsidian, in the form of raw material and artefacts, from the Horn to Arabia as far as the coastal regions of the Indian Ocean and possibly the Persian Gulf arose in the 7th millennium B.C. In the early 2nd millennium B.C. this trade pattern included Eastern Sudan, as far as Erkowit in the southern Red Sea Hills and Aqiq on the coast, the Eritrean Sahel, the Red Sea islands and the Arabian Tihama. Two or three major obsidian sources in Eritrea and/or Djibuti were probably exploited at this time. It

apparently declined in the 1st millennium B.C. (Zarins 1988; see also Francaviglia 1990). The occurrence of a 'Wilton' like industry at Dahlak Kebir confirms the skill of the African peoples to cross the Red Sea in Early to Middle Holocene times (Blanc 1955).

Another pattern of interaction seems to be stressed by the rock art evidence. It suggests the progressive spread of a typical style, representing bovines with the body rendered in profile and the head and horns from the front, over Western Arabia and Northeastern Africa during the middle Holocene (ca. 5000-1000 B.C.). This style is known as 'Jubba Style' in northern Saudi Arabia (Zarins 1982), 'Dalthamani Style' in Central Arabia (Anati 1972) and 'Ethiopian-Arabian Style' in the Horn (Cervicek 1971; 1979). It most likely appeared in northern Saudi Arabia in the mid 5th millennium B.C. Then, around the mid 3rd millennium B.C., it spread to the southern Hijaz (Saudi Arabia), northern Harerge (Ethiopia) and, along the Rift Valley, Southern Ethiopia. In the 2nd/early 1st millennium B.C. it occurred at Jebel Qara (Central Arabia) and in Eastern Ethiopia, Northern Somalia and Eritrea, from where it spread northwards to Nubia, southern Upper Egypt and the Sahara (see Graziosi 1964; Cervicek 1971, 1979; Clark 1972; Anati 1972; Joussaume 1981; Zarins 1982; Brandt & Carder 1987; Jung 1991). Contacts between the peoples of Eastern Ethiopia and Southwestern Arabia might also be suggested by the dolmens discovered near Harar and Dire Dawa (northern Harerge) and dated back to the late 2nd millennium B.C. (Azais & Chambard 1931; Joussaume 1980). They are comparable to some dolmens discovered at Mosna' in southern Yemen (Benardelli and Parrinello 1970), but the link between these monuments is still uncertain.

Between ca. 2500 and 1500 B.C. the people living along the northern Ethio-Sudanese lowlands were also included in a network of contacts with the southern ones of Ethiopia and South Arabia (Fattovich 1993). This is suggested by the Gash Group evidence (ca. 2700-1400 B.C.) collected mainly at Mahal Teglinos, Kassala (Fattovich 1989 a, b). Pottery with decorations comparable to the Gash Group have been recorded at Erkowit in the southern Red Sea Hills, Gobedra near Aksum in the western Tigray, Lake Besaka in the Afar, and Asa Koma near Djibuti (Phillipson 1977; Callow & Wahida 1981; Brandt 1982; Joussaume et al. 1988). In turn, obsidian flakes with Ethiopian origin (Francaviglia, pers. comm.) have been collected in the Late Gash Group level (ca. 1800-1500 B.C.) at Mahal Teglinos (Fattovich et al. 1988). The Gash Group pottery from Mahal Teglinos shows also some general similarities in the decorative patterns and techniques to the Early Bronze Age (ca. 2900-1800 B.C.) in northern Yemen. In particular, some sherds from the Middle and Classic Gash Group levels (ca. 2300-1800 B.C.) are directly comparable to contemporary specimens from Wadi Yana'im, Ar-Raqlah and Wadi Rahmah in Yemen (see Fattovich 1991 b; de Maigret 1990).

Contacts with Southern Arabia are confirmed, as well, by the occurrence of similar sherds in sites culturally linked to the Gash Group and dated to ca.

2000-1500 B.C., near Agordat in the Barka Valley (western Eritrea) and at a site going back to ca. 1500 B.C., at Subr near Aden (Southern Yemen; Arkell 1954; Lankaster-Harding 1964). At present, there is no safe evidence of contacts between the peoples of the Ethio-Sudanese lowlands and the southern ones after the mid 2nd millennium B.C. Only in the 1st millennium B.C. the Gash Delta was included in the area of influence of the peoples living on the western Tigrean plateau (Fattovich et al. 1988).

In the second half of the 2nd millennium B.C. the Afro-Arabian circuit was strengthened by the development of a new cultural complex (Tihama Cultural Complex) along the African and Arabian coasts of the southern Red Sea and the Gulf of Aden. The main sites are Adulis near the Gulf of Zula in Eritrea, Sihi in the Saudi Tihama, Wadi Urq' in the Yemeni Tihama, and Subr near Aden (Paribeni 1907; Doe 1965; 1971; Zarins et al. 1981; Zarins & Zahrani 1985; Zarins & Albadr 1986; Tosi 1986). They represent regional variants of this complex, sharing enough features to be ascribed to the same basic cultural tradition. In particular, the pottery from Sihi is quite similar to the one from Subr. This complex can be dated to ca. 1500-1200 B.C. on the basis of some radiocarbon dates from Sihi (Zarins & Albadr 1986). The pottery from these sites shows many affinities with the Kerma and C-Group pottery from Nubia, suggesting a possible early influence from the African hinterland (Zarins & Zahrani 1985; Zarins & Al-Badr 1986). Moreover, the lithic industry from Sihi is comparable to the Gash Group one at Kassala (Zarins pers. com.), suggesting a possible African background to this complex.

Direct contacts with the peoples living along the Ethio-Sudanese lowlands are suggested by some sherds decorated with burnished linear motifs, comparable to Terminal Gash Group specimens (ca. 1500-1400 B.C.), from sites near Wadi Urq' in the Yemeni Tihama (Fattovich et al. 1988). In the late 2nd/early 1st millennium B.C. the eastern Tigrean plateau was partly included in the cultural area of this coastal complex. In fact, the pottery from the lower strata at Matara (central Eritrea) contains fragments of big jars comparable to types from Subr (see Anfray 1966; Fattovich 1980). Some Arabian features can be also remarked in the so-called Ona Group A with red pottery, a cultural unit recorded on the Hamasién plateau (Eritrea) and provisionally dated back to the second half of the 2nd millennium B.C. (Fattovich 1988). It is identified by polished red slipped ware, often decorated with rim and shoulder-bands, polished axes and small chipped stone bull heads (Tringali 1967; 1969; 1978; 1981; 1984).

The origins of this culture are still uncertain. The pottery seems to belong to an indigenous tradition, being not directly comparable to the one from the neighbouring regions. The polished axes are similar to the Late Gash Group (ca. 1800-1500 B.C.) and Jebel Mokram Group (ca. 1500/1400-1000/900 B.C.) in the lowlands. The stone bullheads, on the contrary, could be ascribed to Arabian traditions, as bovine bucrania are a common motif in the rock art of Central Arabia (Cervicek 1979). Some fragments of big storage vessels with everted rim,

comparable to Late Gash Group and Jebel Mokram specimens, from Sembel Cuscet near Asmara point to contacts with the peoples of the lowlands. Moreover, indirect Egyptian evidence might suggest that this population was able to sail along the Red Sea. In fact, a boat from Punt carrying pots with a long neck similar to Ona Group A vessels is represented on the walls of a Theban tomb most likely going back to the time of Amenophis II, ca. 1425-1401 B.C. (Davies 1935: 46-49).

Engravings of bucrania comparable to the stone ones from the Ona have been also recorded in many localities of the plateau, as far as the eastern Tigray, suggesting that this population spread over a quite wide area (Mordini 1947). Finally, some rock sculptures discovered at the Daarò Caulòs cave near Asmara and most likely going back to the 2nd/early 1st millennium B.C. might be ascribed to an Afro-arabian cultural tradition. They represent human figures with big hands and long hair, showing some similarities to the Arabian rock art. They might confirm contacts between the Hamasien and the Arabian populations. At the same time, these figures remind some decorative motifs on the late prehistoric pottery from Adulis, suggesting contacts with the coastal peoples (Conti-Rossini 1928, Fig. 81, 82; Fattovich 1983; Trintgali 1990).

The following picture of the contacts between the Horn of Africa and Southern Arabia in the Early to Middle Holocene emerges from this evidence:

1. An Afro-Arabian interchange circuit, initially characterized by the circulation of obsidian, arose in the Early Holocene;
2. It was strengthened by more intense contacts between the cattle breeders living in Central Arabia and Eastern Ethiopia in the 3rd-2nd millennia B.C.
3. It involved the peoples occupying the northern Ethio-Sudanese lowlands in the late 3rd to mid 2nd millennia B.C.
4. The population became marginal in the circuit by the mid 2nd millennium B.C.
5. The peoples living along the coastal regions of the southern Red Sea played a crucial role in it in the second half of the 2nd millennium B.C.;
6. The people settled on the Hamasien plateau acted as intermediaries between the western lowlands and the coast in the late 2nd millennium B.C.

The present evidence does not support the hypothesis of migrations from Arabia to Africa in late prehistoric times. On the contrary, it suggests that Afro-Arabian cultures developed in both regions as a consequence of a strong and continuous interaction among the local populations.

## References

- ANATI, E. 1972. *Rock Art in Central Arabia 3: Corpus of the Engravings*. Louvain: ANFRAY, F. 1966. La poterie de Matara. *Rassegna di Studi Etiopici* 22: 529.
- ARKELL, A. J. 1954. Four Occupation Sites at Agordat. *Kush* 2: 33-62.
- AVANZINI, A. 1989. Un exemple de langues en contact: Les inscriptions sudarabes d'Ethiopie. In: T. FAHD (ed.), *L'Arabie Préislamique et son environnement historique et culturel*: 469-478. Leiden: E. J Brill.
- AZAIS, R. P. & R. CHAMBARD. 1931. *Cinq années de recherches archéologiques en Ethiopie*. Paris.
- BENT T. 1893. *The Sacred City of the Ethiopians*. London: Longmans & Green.
- BERNARDELLI, G. & A. E. PARRINELLO. 1970. Note su alcune località archeologiche del Yemen. *Annali dell'Istituto Universitario Orientale di Napoli* 30: 111-120.
- BLANC, A. C. 1955. L'industrie sur obsidienne des Isles Dahlak. In: *Actes Ie Congrès Panafricaine de Préhistoire - Algier 1952*: 355-357. Paris.
- BRANDT, S. A. 1982. A Late Quaternary Cultural/Environmental Sequence from Lake Besaka, southern Afar, Ethiopia. *Ann Arbor*: U. M. I.
- BRANDT, S. A. & N. CARDER. 1987. Pastoral Rock Art in the Horn of Africa: making sense of utter chaos. *World Archaeology* 19 (2): 195-213.
- BRANDT, S. A. & R. FATTOVICH. 1990. Late Quaternary archaeological research in the Horn of Africa. In: P. ROBERTSHAW (ed.), *A History of African Archaeology*: 94-108. London: James Currey.
- BULLIET, R. W. 1975. *The Ethiopia Camel and the Wheel*. Cambridge (Mass.): Harvard University Press.
- CALLOW, P. & G. WAHIDA, 1981. Fieldwork in Northern and Eastern Sudan, 1978-1980. *Nyame Akuma* 18: 34-36.
- CERVICEK, P. 1971. Rock Paintings of Laga Oda (Ethiopia). *Paideuma* 17: 121-136.
- CERVICEK, P. 1979. Some African affinities of Arabian Rock Art. *Rassegna di Studi Etiopici* 27 (1978-1979): 612.
- CLARK, J. D. 1972. *The Prehistoric Cultures of the Horn of Africa*. New York: Octagon Press.
- CLEZIOU, S. & L. COSTANTINI. 1980. Premier éléments sur l'agriculture protohistorique de l'Arabie Orientale. *Paléorient* 6: 245-251.
- CONTI-ROSSINI C. 1928. *Storia d'Etiopia*. Bergamo: Istituto di Arti grafiche.
- DAVIES, N. de G. 1935. The Egyptian Expedition 1934-35. *Bullettin of the Metropolitan Museum of Arts* 30 Nov., supplement.
- DE MAIGRET, A. (ed.). 1990. *The Bronze Age Culture of Halan At-Tiyal and Al-Hada*. Roma: IsMEO.
- DE MAIGRET, A., L. COSTANTINI & F. G. FEDELE. 1984. The Bronze Age of the Yemen Arab Republic. *East and West* 34: 554.
- DOE, B. 1965. Pottery sites near Aden. *Journal of the Royal Asiatic Society* 3 (1963): 150-162.
- FATTOVICH, R. 1980. Materiali per lo studio della ceramica preaksumita etiopica. *Suppl. AION* 25. Napoli: Istituto Universitario Orientale.
- FATTOVICH, R. 1983. I 'rilievi' rupestri di Daarò Caulòs presso Asmara (Etiopia). *Annali dell'Istituto Universitario Orientale di Napoli* 43: 241-247.
- FATTOVICH, R. 1988. Remarks on the Late Prehistory and Early History of Northern Ethiopia. In: T. BEYENE (ed.). 1984. *Proceedings of the Eight International Conference of Ethiopian Studies*. Addis Ababa, I: 85-104. Addis Ababa: Institute of Ethiopian Studies.

- FATTOVICH, R. 1989 a. The Late Prehistory of the Gash Delta, Sudan. in L. Krzyzaniak & M. Kobusiewicz (eds), *Late Prehistory of the Nile Basin and the Sahara*: 481-498. Poznan: Archaeological Museum.
- FATTOVICH, R. 1989 b. Il sito protostorico di Mahal Teglinos presso Kassala (Sudan Orientale). *Rivista di Antropologia* 57: 221-238.
- FATTOVICH, R. 1991 a. Ricerche archeologiche italiane nel delta del Gash (Kassala), 1980-1989: un bilancio preliminare. *Rassegna di Studi Etiopici* 33: 89-130.
- FATTOVICH, R. 1991 b. At the Periphery of the Empire: the Gash Delta (Eastern Sudan). In: W. V. DAVIES (ed.), *Egypt and Africa*: 40-47. London: British Museum Press.
- FATTOVICH, R. in press. Punt: the Archaeological Evidence. *Beiträge zur Sudanforschung* 6.
- FATTOVICH, R. 1993. The Gash Group of the Eastern Sudan: an Outline. In: L. Krzyzaniak, M. Kobusiewicz & J. Alexander (eds), *Environmental Change and Human Culture in the Nile Basin and Northern Africa until 2nd Millennium B.C.* Poznan Archaeological Museum.
- FATTOVICH, R. K. SADR & S. VITAGLIANO. 1988. Società e territorio nel delta del Gash (Sudan), 3000 a. Cr. 300/400 d. Cr. *Africa (Roma)* 43: 349-353.
- FRANCAVIGLIA, V. 1990. Obsidian Tools from Ethiopia to Yemen. Paper delivered at the Eleventh International Conference of Ethiopian studies, Addis Ababa, April 1990.
- GABRA-MARYAM A. T. 1987. *History of the People of Ethiopia* (translated by G. Hudson & Tekeste Negash). Uppsala: Centre for Multi-ethnic Research Uppsala University.
- GARBINI, G. 1984. *Le lingue semitiche*. Napoli: Istituto Universitario Orientale.
- GIYORGHIS, F. 1987. *Storia d'Etiopia* (translated by Yaqob Beyene). Napoli: Istituto Universitario Orientale.
- GRAZIOSI, P. 1964. New Discoveries of Rock Art in Ethiopia. *Antiquity* 138: 91-99, 187-190.
- GLASER, E. 1895. *Die Abessiner in Arabien und Afrika*. Munich: H. Lukaschik
- HETZRON, R. 1972. *Ethiopic Semitic*. Manchester: Manchester University Press.
- HUDSON, G. 1977. Language classification and the Semitic prehistory of Ethiopia. *Folia Orientalia* 18: 119-166.
- HUDSON, G. 1978. Geolinguistic evidence for Ethiopian Semitic prehistory. *Abbay* 9: 71-85.
- JOUSSAUME, R. 1980. *Le mégalithisme en Ethiopie*. Addis Ababa: Artistic Printers.
- JOUSSAUME, R. 1981. L'art rupestre de l'Ethiopie. In: C. ROUBET, H. J. HUGOT & G. SOUVILLE (eds), *Préhistoire Africaine*: 159-175. Paris: Editions A.D.P.F.
- JOUSSAUME, R., S. AMBLARD, X. GUTHERZ & G. MOHAMED. 1988. *Mission Archéologique en République de Djibouti* (11 février-14 mars 1988). Report submitted to the CNRS, Paris.
- JUNG, M. 1991. Research on Rock Art in North Yemen. *Suppl. AION* 66, Napoli: Istituto Universitario Orientale.
- LANKASTER-HARDING, G. 1964. *Archaeology in the Aden Protectorates*. London: Her Majesty's Stationery Office.
- LUDOLF, J. 1682. *A New History of Ethiopia*. London: A. Godbid & J. Playford.
- MARRASSINI, P. 1985. Ancora sulle 'origini' etiopiche. In: S. F. BONDI, S. PERNIGOTTI, F. SERRA & A. VIVIAN (eds), *Studi in onore di Edda Bresciani*: 303-315. Pisa: Giardini Editori.
- MEHRA, K. L. in press. Prehistoric Ethiopia and India: Contacts through Sorghum and Millet Genetic resources. In: J. M. J. ENGELS (ed.), *Genetic Resources of Ethiopia*. Cambridge: Cambridge University Press.

- MORDINI, A. 1947. Le incisioni rupestri di Gazien (Medri Senafè) nell'Endertà. *Rivista di Scienze Preistoriche* 2: 321-323.
- MOSCATI, S. 1960. *Lezioni di linguistica semitica*. Roma: Centro Studi Semitici Università di Roma.
- NORRIS, H. T. 1978. The Himyaritic Tihama. Evidence for a multi-racial society in pre-Islamic and early Islamic Arabia. *Abbay* 9: 101-121.
- PARIBENI, R. 1907. Ricerche sul luogo dell'Antica Adulis. *Monumenti antichi*, Roma: 437-572.
- PHILLIPSON, D. W. 1977. The Excavations of Gobedra Rock Shelter, Axum: an Early Occurrence of Cultivated Finger Millet in northern Ethiopia. *Azania* 12: 53-82.
- POSSEHL, G. L. in press. The status of African Millets in South Asian Prehistory. In: J. JACOBSON (ed.), *Essays in Indian Archaeology*: New Delhi: American Institute of Indian Studies.
- RICCI, L. 1984. L'expansion de l'Arabie Meridionale. In: S. CHELOD (ed.), *L'Arabie du Sud. Histoire et Civilisation*: 249-257. Paris.
- SARASWAT, K. S. 1991. The Dispersal of African Cultivars along the Indian Seaboard: an Appraisal. Paper delivered at the workshop Prehistoric Contact between South Asia and Africa: the Dispersal of Plant Cultivars along the Northern Indian Seaboard, Pune, Dec. 78, 1991.
- TRINGALI, G. 1967. Necropoli di Curbacaiehat (Asmara). *Journal of Ethiopian Studies* 5: 109.
- TRINGALI, G. 1969. Varietà di asce litiche in onna dell'altopiano eritreo. *Journal of Ethiopian Studies* 7: 119-120.
- TRINGALI, G. 1978. Necropoli di Cascasè e oggetti sudarabici (?) della regione di Asmara (Eritrea). *Rassegna di Studi Etiopici* 26: 47-66.
- TRINGALI, G. 1981. Note su ritrovamenti archeologici in Eritrea. *Rassegna di Studi Etiopici* 28: 99-113.
- TRINGALI, G. 1984. Orecchini in pietre ritrovati nella zona di Sembel-Cuscet (Asmara). *Quaderni di Studi Etiopici* 32: 93-95.
- TRINGALI, G. 1990. Danni alle sculture di Daarò Caulòs (Eritrea). *Rassegna di Studi Etiopici* 32: 167-169.
- TOSI, M. 1986. Tihama Archaeological Survey 1986: a Short Note. Up. report to IsMEO (Roma).
- ULLENDORFF, E. 1955. *The Semitic Languages of Ethiopia*. London.
- ULLENDORFF, E. 1973. *The Ethiopians*. London: Oxford University Press.
- ZARINS, J. 1982. Early Rock Art of Saudi Arabia. *Archaeology* 35 (6): 20-27.
- ZARINS, J. 1988. Prehistoric Trade in the Southern Red Sea. The Obsidian Evidence. Paper delivered at the Conference „The Indian Ocean in Antiquity“, London, July 1988. Abstract.
- ZARINS, J. & H. ALBADR, 1986. Archaeological Investigations in the Southern Tihama Plain, II. *Atlatl* 10: 36-57.
- ZARINS, J. A, ALJAWARAD MURAD & K. S. AL-YISH, 1981. The Comprehensive Archaeological Survey. a. The second Preliminary Report on the Southwestern Province. *Atlatl* 5: 937.
- ZARINS, J. & A. ZAHRANI, 1985. Recent archaeological investigations in the Southern Tihama Plain, 1404/1884. *Atlatl* 9: 65-107.