

ALGERIA HAS BEEN HOME TO ROMANS, JEWS, BERBERS, CHRISTIANS, AFRICANS AND ARABS, IT IS A COUNTRY READY TO BE EXPLORED, A REALITY WITH A THOUSAND FACETS, FOR MANY ASPECTS UNSPOILED, IT REPRESENTS A NEVER-ENDING SOURCE OF HISTORICAL TESTIMONY FROM ANCIENT TIMES UNTIL THE PRESENT. IN THIS UNIQUE ENVIRONMENT HISTORY LIVES SIDE BY SIDE WITH MODERN COMPANIES, WHO INVEST IN NEW PRODUCTION PLANTS AND THUS CONTRIBUTE TO INCREASING THE WEALTH OF THE NATION'S ECONOMY, AMONG THESE IS THE TOUSNINA SARL.

TOUSNINA

➤ **WATER SECTOR**

TOUSNINA SARL
Tousnina, Tiaret, Algeria
www.lejdar.com



GEO LOCATION

➤ **COMPLETE LINE OF 20,000 BPH**

- integrated ECOBLOC® ERGON 10-40-10 EV system
- SK 800F ERGON shrink wrapper
- APS 3090P ERGON automatic palletiser
- PACKSORTER divider and conveyors
- Subsupply: high pressure compressor, CIP, inspection systems, coder, labeler, electrical distribution cabinet, wrapper.



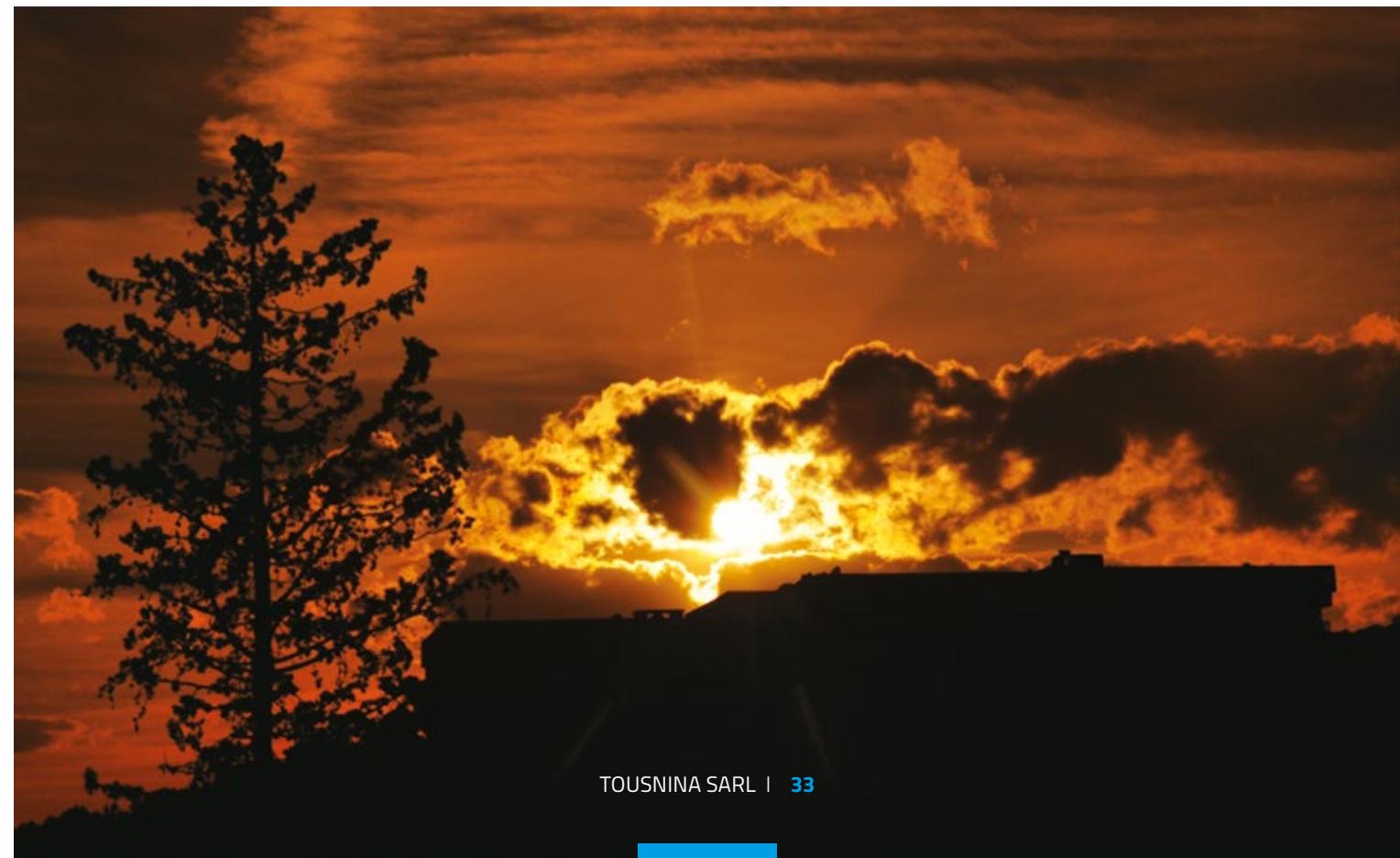
VIDEO

➤ **EBS 4 ERGON**



“LEJDAR” WATER, SYMBOL OF PURITY AND TECHNOLOGY

Near the village of Tousnina, not far from the city of Tiaret, where you can breathe the air of history, flows the spring water of “Lejdar” bottled by Tousnina Sarl. This company recently put their trust in SMI to supply a new 20,000 bottles/hour line to bottle and pack water under the, Lejdar brand, name of which, derives from the archaeological site of the same name, where you can visit important Berber mausoleums from the Roman era. Lejdar is the brand of spring water produced by the Algerian company Tousnina Sarl, from 2003 until today, the brand has claimed an important share of the mineral water market, “a successful and promising market” as declared by the economic operators of this sector. The rapid expansion of this company, thanks to the increase in sales over the last few years, has forced Tousnina Sarl to invest in new high technology production plants, which allow them to efficiently satisfy market demand and to have the base for further development. The Lejdar water bottling factory, situated in the district of Souguer in northern Algeria, has been





equipped with modern and sophisticated equipment, starting from the laboratories, which satisfy the high level of standards required by international regulations. All of this, together with the presence of expert technicians and a modern, company, managerial vision, represent the strength on which the commercial success of Lejdar water is based. Thanks to the new production line, recently installed by SMI, Tousnina Sarl will be able to further strengthen, their bottling and packaging of mineral water procedures, for their internal market and also for export.



↑ AT TOP FROM LEFT: YASSINE MOUHIB, FIELD ENGINEER AT SMI S.P.A.; AEK ABBAS, DIRECTOR OF THE TOUSNINA SARL PLANT, MEHDI DEROUICHE, OWNER OF TOUSNINA SARL; MASSIMO CARMINATI, SERVICE AREA MANAGER AT SMI S.P.A.; MOHAMED DEROUICHE, OWNER OF TOUSNINA SARL AND MOHAMED DJILALI, COMPANY CONSULTANT.

ABOVE: MEHDI DEROUICHE, OWNER OF TOUSNINA SARL.

SMI SOLUTIONS FOR TOUSNINA SARL



For the bottling and packaging of the natural spring water under the Lejdar brand, Tousnina Sarl turned to the experience of SMI, who supplied a complete turnkey line, supporting the customer during design, construction and installation of the 20,000 bottles/hour plant. Apart from the complete line, the Algerian company also bought an EBS 4 ERGON, to integrate in a pre-existing 8,400 bottles/hour line for the production of 0.33 L, 1 L and 2 L PET bottles for bottling carbonated beverages.

All the machines installed in the new line are part of the ERGON range which uses the most innovative technology in the field of Industry 4.0 and IoT (Internet of Things) solutions. The new installations respond completely to the growth expectations of this Algerian company, which has invested exclusively in latest generation systems, to increase their production capacity and satisfy the demands of the local and foreign markets. Relating to the bottling plant for mineral water under the Lejdar brand, the turnkey solution proposed by SMI provided an integrated system from the ECOBLOC® ERGON range for the stretch-blow moulding, filling and capping of PET bottles together with an automatic wrapper from the SK ERGON range, an APS ERGON palletiser, a divider from the PACKSORTER range and conveyors for loose and packed products. The complete supply takes advantage of the latest generation system of automation and control, which uses the best technology available to manage the “smart factory”. This technology, apart from the above machinery, also comprises a labeller, a rotating arm pallet wrapper, an automatic CIP, a coder, inspection systems, a high-pressure compressor and an electrical distribution system.

➤ INTEGRATED SYSTEM ECOBLOC® ERGON 10-40-10 EV

Functions: stretch-blow moulding, filling and capping of 0.33 / 0.5 L / 1.5L bottles in PET with still water at a production of up to 20,000 bottles/hour.

Main advantages:

- the machine groups together in one single block, the stretch-blow moulding, filling and capping operations of bottles in PET and therefore does not need a rinser or airveyors between the blower and filler
- compact and flexible solution to create bottles with flat cap
- precise and rapid filling and capping processes, thanks to the electronic management control system and the use of high efficiency valves managed by flowmeters
- reduced blower energy consumption, thanks to the preform heating module which has high energetic efficiency IR bulbs, and to the stretch-blow moulding module equipped with the dual air recovery system, Air Master, this helps to significantly reduce energy costs tied to the production of high pressure compressed air
- new design with modular structure, no welding, equipped with ergonomic protection doors made from very resistant and long-lasting tempered glass.

➤ SHRINK WRAPPER SK 800 F ERGON

Packed products: 0.33L / 0.5L and 1.5L bottles in PET.

Packs worked: the 0.33L and 0.5L bottles are packed in 4x3 film only, the 1.5L bottles are packed in 3x2 film only.

Main advantages:

- automatic machine suitable for packing varied containers in different pack configurations in film only
- quick and simple format change over, which allows the change of production in little time according to present and future company requirements
- compact and ergonomic structure, that facilitates the manual maintenance and repair interventions on the internal part of the machine
- the motors are connected directly to the drive shafts, with the advantage of reducing maintenance, energy waste and noise
- shrink-wrapper equipped with the optional innovative “automatic film splicing device with heated blade” system, this joins the edge of the reel which is about to finish with the beginning of the new reel while the machine is running, with no need to stop production. Compared to traditional hot sealing methods, this new device dramatically reduces energy costs and maintenance as it is not necessary to keep the sealing rollers at a high temperature and it also allows more sealing precision when joining the rolls of printed or clear film with a reference mark (with +/- 10 mm from the reference mark). The “film welding device with heated blade” can also handle “non-fusion” film without any problems.

➤ AUTOMATIC HANDLE APPLICATOR HA 80

Packed products: the automatic handle applicator HA 80 attaches a handle to the 3x2 and 4x3 packs arriving from the SK 800F.

Advantages:

- monoblock structure in painted steel
- steel safety guards and sliding doors equipped with see through panels in lexan
- rubber-coated infeed conveyor with chains made from thermo-plastic material providing a high co-efficient of friction
- cardboard labels provided with pneumatic withdraw and electronic control of the handle pitch
- motorized reel support with pneumatic locking and automatic tensioning of the adhesive tape dragging by a motorised wheel driven by Encoder and Inverter
- the HA range can apply different kinds of handles coupled with the transparent adhesive tape: in pre-cut cardboard, rolls of pre-handled adhesive tape and rolls of paper or polypropylene handles
- FLXMOD® control system equipped with 4.3” graphic LCD control panel and PLC.

➤ PACKSORTER PACK DIVIDER-SORTER

Packed products: packs in film only of 0.33L and 0.5L bottles in 4x3 and packs in film only of 1.5L bottles in 3x2 coming from the SK 800 F.

Lanes formed: 2

Main advantages:

- automatic device that receives packs in single lane from the SK800F shrink wrapper upstream and, thanks to the innovative sorter system on three Cartesian axis (x, y, z), it puts them into two lanes channelizing them towards the APS 3090 P ERGON, automatic palletising system downstream
- the use of high quality materials guarantees its operational reliability and long life
- safety protection guides in aluminium and lexan
- reduced plant running costs
- low energy consumption motors
- sliding protection doors in curved anodised steel, that allow all motors to be positioned on the exterior to facility cleaning and maintenance operations.



➤ APS 3090 P ERGON AUTOMATIC PALLETISING SYSTEM

Packed products: packs in film only of 0.33L and 0.5L bottles in 4x3 and packs in film only of 1.5L bottles in 3x2 coming from the pack divider/sorter.

Pallets formed: 1000x1200 mm pallet.

Main advantages:

- the central column is actuated by brushless motors, which guarantee highly dynamic, reliable and precise movements of all axes of operation and ensure a high level of reliability, reduced maintenance and low operating costs
- entrusted with Sercos Fieldbus innovative technology, thanks to which the operator, by means of a simple and intuitive man-machine interface, can easily and rapidly manage all the end of line palletising operations
- the palletiser is equipped with a PLC which monitors all the correct functioning of safety devices, integrating their performances for a safe intersection between areas of handling inside the machine perimeter, dramatically reducing machine down-time, both in an emergency and during pallet loading operations
- low running and maintenance costs.

➤ CONVEYORS

Function: transporting loose and packed bottles in PET, in particular: moving outfeed bottles from the integrated ECOBLOC® ERGON system, moving packs between the SK 800 F ERGON shrink-wrapper and PACKSORTER divider and in infeed to the APS ERGON palletiser.

Main advantages:

- the loose product conveyors installed at the Sarl Tousnina factory guarantee, the fluid, constant movement of all containers, without any hitches, to the SK 800F infeed and of the packs in the section between the shrink wrapper, pack sorter and palletiser
- latest generation Posyc® control panel, equipped with LCD colour touchscreen, to allow the operator to intervene easily and intuitively
- sophisticated sensors positioned in strategic places allow high levels of operational efficiency in every phase of the production cycle.

➤ ROTATIONAL STRETCH BLOW- MOULDER EBS 4 ERGON

Functions: apart from the Lejdar water bottling line, the Algerian company Tousnina also bought an SMI rotary stretch blow-moulder EBS 4 ERGON to produce 0.5L / 1.5 L and 2 L bottles in PET to bottle carbonated beverages with a maximum production speed of 8,400 bottles / hour.

Main advantages:

- completely electronic blowing technology developed to reach high production and optimise performance of each cavity
- compact and flexible machine, with cutting edge technology
- stretch blow-moulding module equipped with motorised stretch rods, whose function is controlled electronically, it does not need mechanical cams
- heat reflecting panels made from composite material, mounted at the front and at the rear of the infra-red lamps to increase the intensity of the thermal rays and therefore, reduce energy costs
- guaranteed precise heating profile for each pre-form
- management and control of each mould and therefore, of each cavity
- rapid format change over and mould substitution
- reduced running and maintenance costs
- low consumption of high pressure compressed air, thanks to the Air-Master air recovery system and the low dead volume in each stretch-blow moulding station.

THE LONG HISTORY OF TIARET

Situated at around 150 km from the Mediterranean coast, in south-west Algeria, Tiaret is in the region of the Atlas Mountains (central plateau of Algeria). The presence of numerous megalithic monuments in the province of the same name, are witness to the long history of which Tiaret can be proud. The city today, with around 150,000 inhabitants, is built on a site which was originally a Roman station or a stopover for merchants, travellers and armies, as can be seen from the origin of its name (Tiaret or Tahert or Tihert), which in Berber, means "station".

Tiaret was founded by the Romans, who gave it the name Tingurtia (from which today's name derives, with the same meaning "station"), during the Byzantine period it became the capital of western Algeria and later on the capital of the Berber reign. The testimonies of this period can be seen in the near vicinity of Mount Hadjar where you can visit the "Jedar", a group of stepped pyramids, up to 30 metres high, with square foundations, probably used as tombs for the Berber princes (Amazigh) in the sixth and seventh century. Tiaret was also an important Arabian city in the seventh century, known as Tahart ("Lioness"), while

in the following centuries it fell under Turkish control and finally in 1843, under the French. Thanks to its strategic position, Tiaret has always been an object of conquest, even though it wasn't particularly appreciated by the local tribes of Berbers, the arrival of the French in the XIX century brought it a certain degree of stability and economic prosperity. The favourable climate together with the availability of water created cultivations and the breeding of livestock, in first place horses, Arabian thoroughbreds. The availability of stream water helped the development of bottling industries as can be seen by the business activities of Tousnina Sarl.

UNIQUE AND APPEALING DECORATIONS!

In the beverage industry, the development of an innovative container in PET, with a unique design and highly desired finishing touch, is without a doubt an efficient way to attract attention and choices of the final consumers. Starting from the requirements of the Algerian customer, who wanted to reproduce the company logo, also present on the label, on the shoulder of their 0.33 L, 0.5 L and 1.5 L bottles, the SMI bottle designers created very original containers characterised by elements of "appeal" which are able to add value to a light, unbreakable, economical material like PET. The image of the logo, that reproduces the typical Berber mausoleums of the nearby "Jedars" archaeological site, was elaborated to give an original and captivating look making the Lejdar bottle immediately recognisable for its shape and "design". The most particular aspect of the decoration, reproduced on all the bottom part of the bottle, reminds you of a stone wall, typical of the Jedars, that ideally connects the brand to the archaeological site from where it originated.



NOT ONLY DESERT: DISCOVERING THE SITE OF THE “JEDAR”

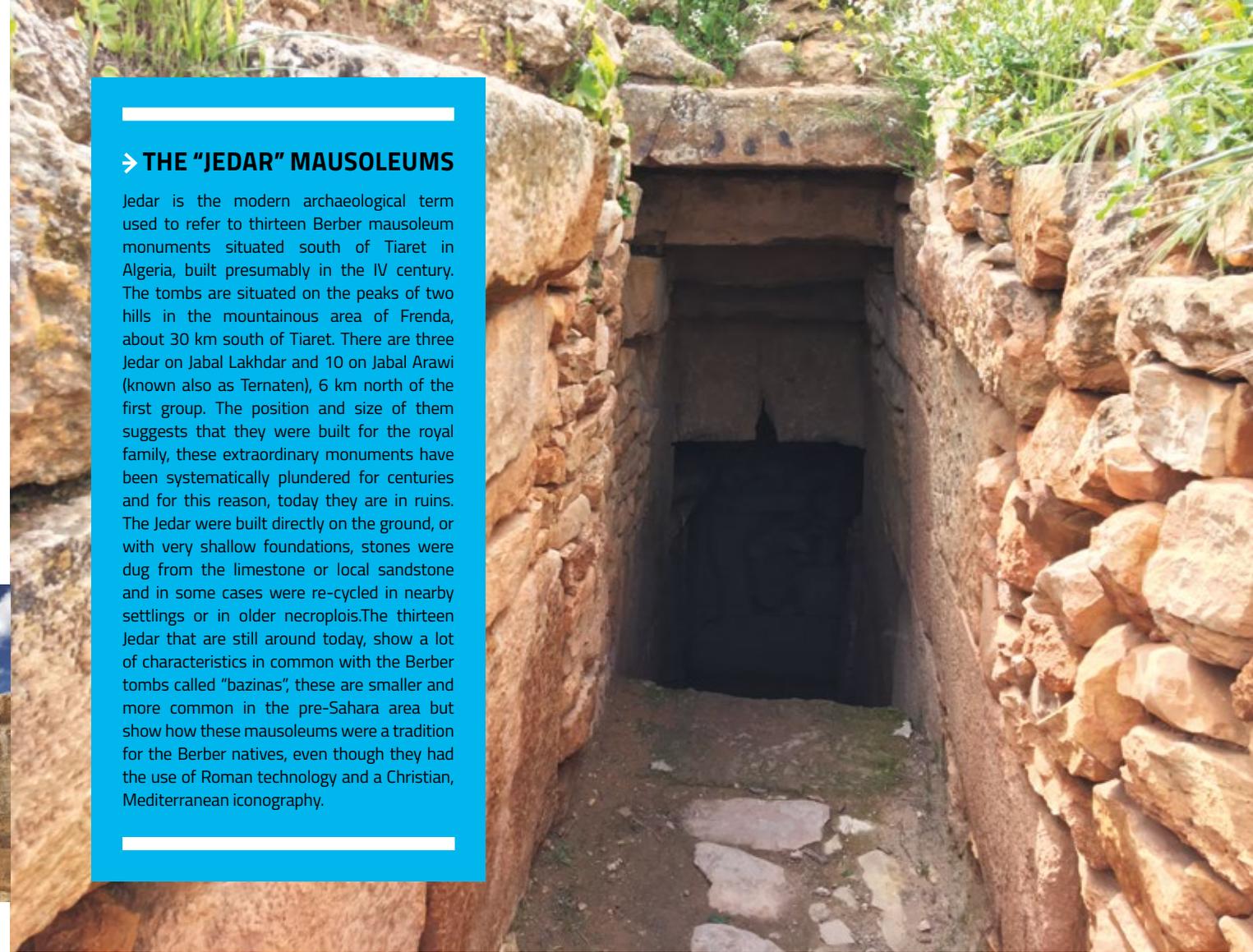
Algeria is not only desert, for example, the city of Tounsinna seems to be lost in the boundaries of the famous “Jedar”, Berber funeral tombs that give a magical atmosphere to this place that seems to be suspended in time. Today, the Jedar are in ruins, even though it is surprising that they are still standing after all this time and events. From a tour around the structure you can see, on the first stones placed on the ground, a few bas-reliefs, some show animals such as the lion, the giraffe or the pink flamingo (in each case animals present in the region at that time). Some stones show scenes, you can see a man holding an animal, that looks like a horse, tied to a leash. The door and the few stones that go down towards the interior of the mausoleum are on the western side. Everything in the mausoleum is “black and cool”, the coolness that rules the mausoleum is that of dark places, of isolate places not pierced by the light. It is

the glacial coolness of tombs that flows around the large mausoleum stones. One stone must have been the door, on the inside, as soon as you have gone over the threshold a corridor leads you, sometimes to the right and sometimes to the left, at the end of which, there are three rooms with paintings showing Berber themes, that today can still be seen on ceramics and rugs.



→ THE “JEDAR” MAUSOLEUMS

Jedar is the modern archaeological term used to refer to thirteen Berber mausoleum monuments situated south of Tiaret in Algeria, built presumably in the IV century. The tombs are situated on the peaks of two hills in the mountainous area of Frenda, about 30 km south of Tiaret. There are three Jedar on Jabal Lakhdar and 10 on Jabal Arawi (known also as Ternaten), 6 km north of the first group. The position and size of them suggests that they were built for the royal family, these extraordinary monuments have been systematically plundered for centuries and for this reason, today they are in ruins. The Jedar were built directly on the ground, or with very shallow foundations, stones were dug from the limestone or local sandstone and in some cases were re-cycled in nearby settlements or in older necropolis. The thirteen Jedar that are still around today, show a lot of characteristics in common with the Berber tombs called “bazinas”, these are smaller and more common in the pre-Sahara area but show how these mausoleums were a tradition for the Berber natives, even though they had the use of Roman technology and a Christian, Mediterranean iconography.



THE ORIGIN OF THE TERM “BERBER”

It was the Romans, who occupied the region for almost six centuries, who used the term «barbarians», intended as something different to their culture, for the indigenous population of the southern shores of the Mediterranean, whose origins go back as far as 5,000 years B.C. The name was later translated by the Arabs into “barbar” and then by the French into “berbère”. In reality the “Berbers” were the guardians of a remote civilisation of indigenous North-African population, that lived in a vast area known as “Tamazgha”,

which corresponds to the modern states of Morocco, Algeria, Tunisia and Libya. Their alphabet the “tiffinagh”, is considered to be one of the oldest in the world and is still used today by the Tuareg in southern Algeria. After various events that saw them become less and less independent, the Berber reign lost their independence in 40 A.D. under Caligula. During the Roman domination, lots of Berbers discovered art, in politics and in religion, expressing themselves in the written language of the time, in Latin. There were lots of writers (from Terence to Martianus Capella), Christian saints (Saint Cipriano, Saint

Victor, Saint Augustine and Saint Monica), popes (Victor I, Melchisedes, Gelasius I) and emperors (from the Libyan-Punic Septimius Severus, founder of a dynasty, to Macrinus and Emilianus) of undoubted Berber ancestry. After being under Roman rule for such a long period, North Africa was invaded in the V century by the Vandals from Genseric, who built the North Africa kingdoms, until in 534, an expedition led by Belisarius, sent by Justinian I, reconquered it to the supremacy of Bizanzio. This domination lasted little more than a hundred years, as in the VII century new invaders arrived, the Arabs.

