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A new late Pleistocene vertebrate faunal complex from Sicily (S. Teodoro Cave, North-Eastern Sicily, Italy)

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ABSTRACT – Previous excavations at the S. Teodoro Cave were carried on mainly in the upper unit, Late Glacial in age, containing late Upper Palaeolithic stone artefacts and no endemic mammals remains belonging to the Castello faunal complex, the youngest of the Pleistocene Sicilian faunal complexes. This unit overlies an older deposit of clay and sands which contain Pleistocene endemic mammal remains. During 1998 excavations a maximum depth of m 1.50 over an area of about 12 sq. m has been exploited. Scarce evidences of the Late Glacial have been encountered during excavations. The investigated lower unit (unit B) is made of clayey sands and gravels containing a highly diversified assemblage of vertebrates (elephant, horse, wild ox, deer, wild boar, hyena, fox, mouse, ground vole, shrew, hedgehog, bats, birds, reptiles) invertebrates (molluscs), and vegetal remains. Damages on bones and abundant coprolites testify an intense hyena activity. The collected data allow us to bring new refinements to the scheme of the Pleistocene vertebrate complexes of Sicily. The association of the elephant (*Elephas mnaidriensis*) with the equid (*Equus hydruntinus*), which were previously thought to represent the typical taxa of two different faunal complexes (the endemic *Elephas mnaidriensis* faunal complex and the younger, not endemic, Castello faunal complex), evidences a longer survival of the elephant in Sicily and a dispersal event of the *Equus hydruntinus* in the island older than so far known. The assemblage of small mammals is completely renewed respect to that of the *E. mnaidriensis* faunal complex, and includes not endemic taxa such as *Microtus* (*Terricola*) ex gr. *savii*, *Apodemus*, *Erinaceus* and *Crocidura* cf. *sicula*. A similar micromammal assemblage occurs in the fauna of the Castello faunal complex as well as in two recently described sites in Sicily (Contrada Pianetti and K22 – upper levels) which contain a faunal assemblage similar to that of the S. Teodoro Cave. The S. Teodoro cave assemblage confirms the existence of a new faunal complex in the Pleistocene of Sicily which contain some endemic taxa surviving from the *Elephas mnaidriensis* faunal complex associated with not endemic taxa.

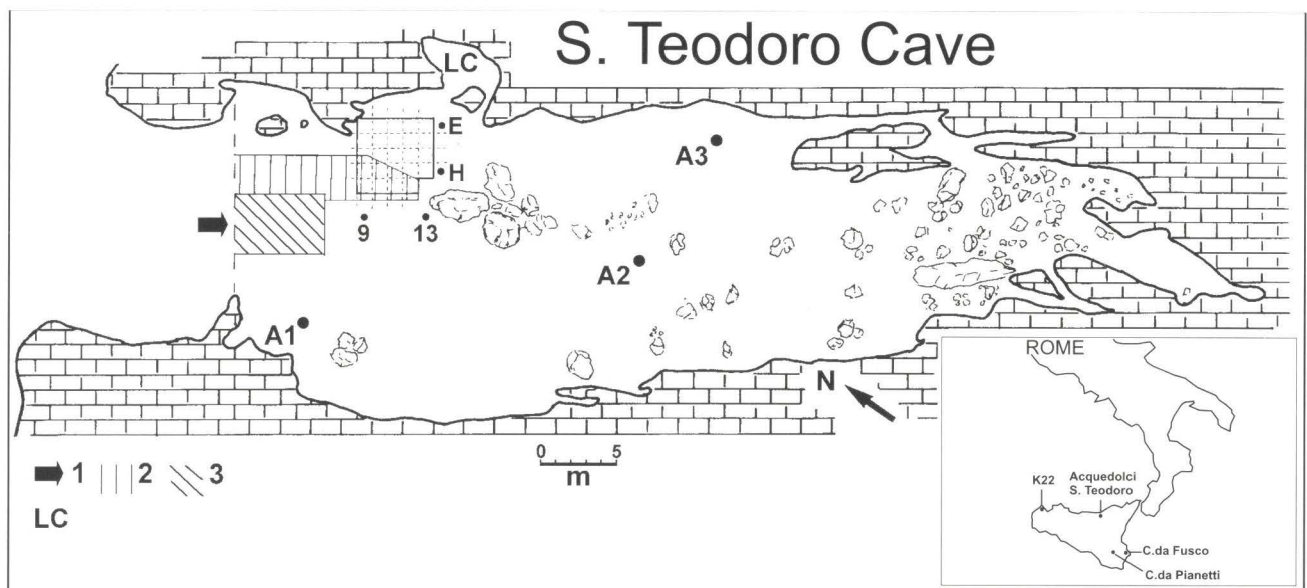
RIASSUNTO – [Un nuovo complesso a vertebrati tardo-pleistocenici della Sicilia (Grotta di S. Teodoro, Sicilia nord-orientale)] – Dalle precedenti ricerche risulta che nella Grotta di S. Teodoro sono presenti due unità stratigrafiche, delle quali la superiore, di età Tardiglaciale, contiene manufatti litici del tardo Paleolitico Superiore (Epigravettiano) associati a resti di pasto rappresentati da elementi scheletrici di mammiferi non endemici appartenenti al Complesso di Castello, il più recente dei complessi faunistici a vertebrati del Pleistocene della Sicilia. L'unità inferiore, costituita da argille e sabbie, contiene resti di mammiferi endemici. Nel 1998 sono stati condotti scavi su di un'area di circa 12 mq., per una profondità di m 1.50. Dell'unità superiore (Unità A) sono conservati scarsi residui. L'unità inferiore (Unità B) è costituita da sabbie e ghiaie argillose contenenti un'associazione ben diversificata di vertebrati (elefante, cavallo, bue, cervo, cinghiale, iena, volpe, topo, arvicola, toporagno, riccio, pipistrelli, uccelli, rettili), invertebrati (molluschi), e resti vegetali. Abbondanti coproliti e danneggiamenti sui resti scheletrici testimoniano una intensa attività di popolazioni di iene. I dati raccolti portano nuovi contributi per una migliore definizione dei complessi a vertebrati pleistocenici della Sicilia. L'associazione dell'elefante (*Elephas mnaidriensis*) con l'equide (*Equus hydruntinus*), che sono stati considerati finora taxa tipici di due differenti complessi faunistici (il complesso endemico a *Elephas mnaidriensis* e il più giovane, non endemico, Complesso di Castello), testimonia una sopravvivenza dell'elefante in Sicilia maggiore di quanto ritenuto finora e una dispersione dell'asino nell'isola più antica di quanto finora noto. L'associazione di micromammiferi è completamente rinnovata rispetto a quella del Complesso faunistico a *E. mnaidriensis*, e include taxa non endemici come *Microtus* (*Terricola*) ex gr. *savii*, *Apodemus*, *Erinaceus* e *Crocidura* cf. *sicula*. Un'associazione di micromammiferi simile è presente nel complesso faunistico di Castello e in due siti recentemente descritti in Sicilia (Contrada Pianetti e livelli superiori del sito K22) che contengono un'associazione faunistica simile a quella della Grotta di S. Teodoro. L'associazione faunistica rinvenuta nella grotta di S. Teodoro conferma la probabile esistenza di un nuovo complesso faunistico nel Pleistocene della Sicilia che contiene alcuni taxa endemici sopravvissuti dal complesso faunistico a *Elephas mnaidriensis* associati a taxa non endemici.

FOREWORD

The San Teodoro Cave is a landmark for the study of Upper Palaeolithic culture in Sicily, not least because of the great scientific prestige of the researchers who have been carrying on excavations and studies since the second half of the XIXth century (Anca, Vaufray, Maviglia, Graziosi). This cave, very suggestive for its huge dimension (about 60 m long, 20 m wide and up to 20 m high), opens in Jurassic limestone and has a relatively small entrance and a total surface of more than 1.000 m² (Text-fig. 1). The

longer axis is oriented according to a NNW-SSE fault system (Robillard, 1975).

In previous excavations the Authors distinguished an upper Late Glacial sedimentary unit, containing humans' feeding remains (mammal bones) associated with late Upper Palaeolithic (Epigravettian) stone artifacts, and a lower sedimentary unit (unit B in this paper) containing late Pleistocene endemic mammal remains (Anca, 1859-60; Vaufray, 1928, 1929; Tricomi, 1938; Maviglia, 1941, 1942; Graziosi, 1943, 1947; Graziosi & Maviglia, 1946; Leonardi, 1939, 1941; Lona 1949). Within the prehistoric



Text-fig. 1 - Plan of the S. Teodoro Cave: the 1998 trench (E-I/9-13) and the trial pits location (A1, A2, A3) are indicated. 1) Cave entrance; 2) Location and probable extension of the trench excavated by Maviglia (1941) and by Graziosi (1947); 3) Probable location of the excavation trench by Anca (1959-1860); LC = Lateral cavity entrance. Survey by Hyblean Speleo Club (Ragusa)(1998). On the right side vertebrate bearing deposits in Sicily quoted in the text.

deposit two successive cultural phases have been identified (Vigliardi, 1968, 1989), which are also known in other Sicilian prehistoric sites where they have been dated from 14.000 to 11.000 years BP. (Radiocarbon dating, Martini, 1997).

The great importance and interest of San Teodoro Cave is also, and mainly due to the presence of the first, and so far still unique, Palaeolithic burials of Sicily, which have been referred by the authors to the oldest anthropic frequentation phase of the cave. Skulls and exceptionally complete and preserved articulated skeletons of at least seven humans have been recovered which have been buried in the clayey sands and gravels of the lower stratigraphic unit (Graziosi, 1947; Fabbri, 1989, 1993).

Even though the San Teodoro Cave has been object of intense episodes of human frequentation ranging since upper Palaeolithic to present, it still preserves a consistent part of the older, not anthropic, deposits which contain Pleistocene mammals. After its discovery and first excavations by Anca (1859-60), the trial pits by Vaufray (1928; 1929) and by Bonafede who first discovered humans inhumed in the lower unit (Tricomi, 1938), the excavations of Maviglia (1941, 1942), and Graziosi & Maviglia (Graziosi, 1943; 1947; Graziosi & Maviglia, 1946) were aimed exclusively to the recovery of human skeletons. During 1998 new excavations were carried out devoted to the reconstruction of the stratigraphy of cave deposits and to a better knowledge of the faunal assemblages, especially the older one.

Since only scattered relics of anthropic Epi-

gravettian soil (unit A in this note) were preserved to date, the trench has been excavated mainly in older deposits (unit B in the present note).

The results of the 1998 excavations give new contributions concerning the history of Pleistocene mammal populations of the island and provide original taphonomic aspects not only for Sicily, but also for the Italian Peninsula (Bonfiglio *et al.*, 1999).

The 1998 excavations inside the cave follow extensive stratigraphical investigation and excavations carried out during the years 1982 -1987 at the base of the high vertical cliffs of the carbonatic massif in which the San Teodoro Cave opens. This field survey has brought to light late Middle Pleistocene lacustrine deposits containing largely prevailing bones of *Hippopotamus pentlandi*, the endemic Sicilian hippo, associated with scarce and fragmentary bones of *Elephas* sp., *Cervus siciliae*, *Ursus* cf. *arctos*, *Canis lupus*, *Testudo* cf. *hermanni*, Aves (Bonfiglio, 1985, 1987 a, 1989, 1992, 1995; Bada *et al.*, 1991).

METHODS

This study includes both a field and a laboratory phase. The field work was carried out during approximately 12 weeks of excavations spread out over the summer of 1998.

A grid of squares (side 1 m) identified by surface co-ordinates (numbers and caps letters) have been superposed to the cave floor, starting from the entrance. Square numbers start from the entrance (n. 1) and proceeds towards the inner of the cave. Letters

start from M, indicating squares immediately eastward of the major axis set at the centre of the cave and N for squares immediately westwards. The excavation trench has been located on the eastern side of the cave on a square surface of 25 m² (coordinates 9 to 13 and E to I) and partly includes the area excavated by Graziosi and Maviglia, refilled by the same authors with sediments resulted from digging (Text-fig. 1).

The depth coordinate, reported for cuts and significant specimens (Text-fig. 2), starts from a landmark (quote '0') marked on eastern side wall of the cave. Each square of surface has been deepened by cuts of 10 cm. The recovered material is therefore identified by surface (square) and depth (cut) coordinates. Large sized faunal remains have been collected directly during excavation, while small specimens (microvertebrates, molluscs, seeds) have been recovered by sieving. All the sediment resulting from cut units has been first dry-sieved and then screen washed on a 2 mm mesh. Sediment samples for pollen, lithological and micromorphological analysis have been also collected.

Finally, reworked sediment extracted from Graziosi and Maviglia trench has also been sieved, since the very abundant skeletal remains and stone artifacts left by these authors during their work, even though indication of their stratigraphic position have

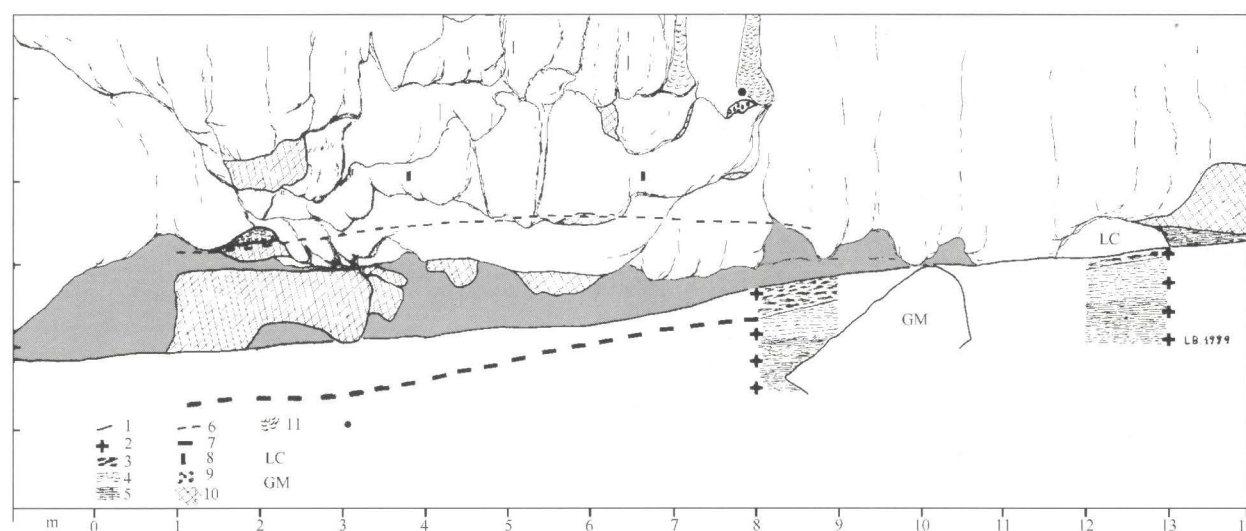
been lost, still maintain their value as historical documentation.

STRATIGRAPHIC AND FAUNISTIC DATA

In the excavation trench a large limestone boulder, with a flat upper surface and NE-SW elongation allows to separate the part of the deposit *in situ* from that already interested by previous excavations. This boulder was clearly reported also in Graziosi and Maviglia stratigraphic sections (Maviglia, 1941, pl. II; Graziosi, 1947, fig. 1).

The northern wall of 1998 trench, which roughly corresponds to the southernmost extension of Graziosi & Maviglia trench, cuts an upper level consisting of reworked sediments and materials and a lower deposit, consisting of sandy clays, which represents the lower unit. At the intersection between 1998 northern wall with the eastern limit of Graziosi excavations (eastern side of the cave), a section of the red ochre level which covered the burials, an exclusive peculiarity of Palaeolithic burial ritual at S. Teodoro, is exposed.

The surface of the deposit *in situ* was quite irregular. In some squares only (9F, 9G and 13H) relics of the archaeological layers were present. In other squares a cover made up by artificially accumulated



Text-fig. 2 - Schematic outline of the lithological and morphological characters of the first 14 m of the eastern wall of the S. Teodoro Cave, starting from squares 1 (Cave entrance). Stratigraphical data from the literature and from 1998 excavations area shown: 1) Present profile of the cave floor along the boundary between squares E and F; 2) Boundaries of the 1998 trench; 3) Archaeological (Epigravettian) levels (unit A); 4) Reddish clayey sands of the unit B; 5) Gray-greenish clayey sands of the unit B; 6) Profile of the cave floor at the time of the Maviglia and Graziosi excavations reconstructed from Maviglia (1941) and Graziosi (1947) data; 7) Section of the red ochre level which covered the burials (Square 9G) reconstructed by Graziosi (1947, fig. 1); 8) Traces of red paint on the wall, which probably show the location of the Palaeolithic burials ns. 2, 4, 5 (Graziosi 1947, fig. 1); 9) Carbonatic concretions containing abundant snails; 10) Remains of concretioned prehistoric bone breccia; 11) Stalagmites. GM = Section of the limestone boulder illustrated by Graziosi (1947) which separates the part of the deposit *in situ* from that already interested by previous excavations; LC = Lateral cavity entrance; black circle: location of landmark (quote '0').

limestone blocks rests directly on the sandy clays which have been evidently cut off in recent times by some anthropic activity.

To sum up, 1998 excavations have interested almost exclusively the sediments of the lower (pre - Late Glacial) unit, for a total depth of about 1.50 m.

Lithology and fossil content is fairly uniform along all the investigated depth. The sediment is prevalently clayey sand, yellowish in the upper 50-60 cm and then gray-greenish in the deeper part of the deposit. Thin laminated levels, dark red in colour, are visible in the lower part.

Vertebrate remains are scattered within all excavated levels. Skeleton remains of large mammals are fragmented and not articulated. The material resulting from washed samples of sediment consists of a large number of mammal bones and hyena coprolite fragments, small vertebrates (rodents, insectivores, bats, birds, amphibians and reptiles), small gastropods and seeds. The numerous and diverse evidences of cave frequentation by spotted hyena populations is actually the most prominent taphonomic feature of this deposit. These evidences consist in the occurrence of several *Crocota* skeletal elements (skull, teeth, limb bones), an impressive quantity of coprolites, and in ubiquitous traces of crushing, gnawing, chewing and digestion that have been detected on almost all large mammal remains (Bonfiglio *et al.*, 1999; Marra *et al.*, 1999). These taphonomic characters have been found so far in only one cave deposit in the Italian peninsula (Grotta Guattari; Piperno & Giacobini, 1991) and are actually a novelty for insular environments.

Trial pits carried out in three different points of the cave (Text-fig. 1, A1, A2, A3) show, below a thin sterile sandy layer, the same features and the same faunal content as the main excavation trench.

THE VERTEBRATE ASSEMBLAGE

The description of the vertebrate assemblage is a preliminary report, concerning a part of the very abundant material recovered so far. In fact some of the listed taxa, especially carnivores and micromammals, are poorly known from Sicilian vertebrate bearing deposits. The few examined micromammals samples cover, however, in some squares the whole thickness of Unit B. The collected remains are object of more detailed studies in progress. Tab. 1 gives the list of the taxa collected from unit B, and taxa which have been listed in the stratigraphical description of previous papers.

According to Burgio & Di Patti (1990), the Anca collection of fossils from S. Teodoro cave preserved in G.G. Gemmellaro Museum at Palermo, includes also remains of *Bison priscus siciliae* and *Dama dama*. In the definitive list of fossils from S. Teodoro cave published by Anca (1859-60, p.693) according to determination made by Lartet, some taxa, which have not

been listed in the stratigraphical description, are reported, among which hippo, wolf (*Canis lupus*), bear (*Ursus cf. arctos*), fox (*Canis vulpes*), hedgehog, hare, birds.

While a provenance from the deposits outcropping outside the cave can be inferred for hippo remains, the bear maxillary figured in plate XI, fig. 4 by Anca (1859-60) is of uncertain provenance since remains of *Ursus cf. arctos* are also present in the external deposit.

LARGE MAMMALS

Carnivores

Crocota crocuta spelaea (Goldfuss, 1832). The spotted 'cave' hyena is represented by 4 cranial fragments, 4 incomplete hemimandibula fragments, several isolated teeth, 1 distal epiphysis of humerus, 1 radius, 1 femur, 1 femur shaft. The larger cranium fragment (ST 98; PL 4802) is a nuchal portion where occiput, basioccipital and parietals are preserved. The sagittal crest is high and sturdy. The occipital crest is projected strongly backwards. The occiput has a triangular shape and is high and narrow. Hemimandibulae have a short and high horizontal ramus.

Upper and lower premolars are preserved on bone and isolated. Upper premolars (except P\4) are sturdy and almost circular in section; lower premolars are sturdy and oval in section. Teeth of all ages (juvenile, young adult, adult, senile) are present. Long bones are slender.

Cranial bones and teeth are more frequently represented than postcranial bones. All hyena bones (except the larger cranial fragment) show serious damage by conspecific crushing and gnawing.

Canis lupus Linné, 1758. Only a right maxilla fragment (ST98; PL2093) is present. The alveolar portion with M\1-P\3 and M\2 and P\2 alveoli is preserved.

First upper molar is broad; lateral cusps are circular in section, buccal cusp is stout. Carnassial has a long main cusp (anterior) and a smaller accessory one. Third premolar has a large anterior cusp and a smaller posterior one. Size is comparable with present-day wolves.

Vulpes vulpes (Linné, 1758). Two canines, 1 premolar, 1 humerus and 1 metapodial bone belonging to red fox are present. Teeth are small and pointed. Limb bones are slender.

Arctiodactyls

Sus scrofa Linné, 1758. One lower incisor, one lower canine, two molars, one mandible fragment, two humeri (ST98 PL 4397, right humerus; ST 98 PL 4661, left humerus), one tibia have been collected.

Taxa	Lower unit			Upper unit			Unit B
	Anca 1859	Graziosi 1947	Vaufrey 1929	Anca 1859	Graziosi 1947	Vaufrey 1929	Excavations 1998
<i>Crocota crocuta spelaea</i>	X	X	X				X
<i>Canis lupus</i>							X
<i>Vulpes vulpes</i>			X			X	X
<i>Elephas mnaidriensis</i>	X	X	X				X
<i>Cervus elaphus siciliae</i>	X	X	X				X
<i>Bos primigenius siciliae</i>	X						X
<i>Sus scrofa</i>	X			X	X	X	X
<i>Equus hydruntinus</i>		X		X	X	X	X
<i>Bos primigenius</i>					X	X	
<i>Cervus elaphus</i>				X	X	X	
<i>Erinaceus cf. europaeus</i>							X
<i>Apodemus cf. sylvaticus</i>							X
<i>Microtus (Terricola) ex gr. savii</i>							X
<i>Crocidura cf. sicula</i>							X
Rodents	X						
Chiroptera							X
<i>Columba livia/oenas</i>							X
<i>Falco columbarius</i>							X
<i>Falco tinnunculus</i>							X
<i>Pyrrhocorax graculus</i>							X
<i>Pyrrhocorax pyrrhocorax</i>							X
Caradriiformes							X
Corvidae							X
Passeriformes							X
<i>Podarcis</i> sp.							
Gekkonidae indet.							X
<i>Testudo</i> sp.							X
<i>Hyla</i> gr. <i>H. arborea</i> .							X
<i>Rana</i> sp							X
<i>Bufo viridis</i>							X
Anura indet							X
Amphibians	X						

Tab. 1 - Faunal composition of upper and lower unit according the previous excavations compared with 1998 results.

Lower second incisor (ST98; PL 3115) is long and straight. First inferior molar (ST98; PL 2747) has four main cusps and a posterior accessory tubercle. Third lower molar (ST98; PL 756) is fragmentary and worn. It shows cusps and tubercles in section. The inferior left canine (ST98; PL 743) is large and curved, triangular in section. The olecranon fossa is deep and perforated in both specimens of humeri. Trochlea is narrow.

Cervus elaphus siciliae Pohlig, 1893. The endemic red deer of Sicily is the most represented species. 22 shed antlers, 34 antlers, 9 skull fragments, 21 hemi-mandibles, 62 teeth, 16 limb bones, 28 metapodials, 20 podials and 33 phalanges have been recovered. Morphological and biometrical features are according to *Cervus elaphus siciliae* (Gliozzi *et al.*, 1994).

Bos primigenius siciliae Pohlig, 1911. The endemic auroch of Sicily is represented by: 1 upper molar, 3 lower molars, 1 medio-distal fragment of femur; 1 medio-distal fragment of tibia, 1 scaphoid bone, 2 astragali.

M/3 and M/2 are preserved on a mandibular fragment. M/3 has a rounded labial valley between hypoconid and hypoconulid. Hypoconulid is slightly inclined.

The two sides of the femur trochlea are parallel and inclined towards the bone axis. The two tibia articular facets for the malleolus are confluent; the dorsal malleolar facet is slightly concave. The epiphysis of metatarsal bone has a quadrangular profile. The dorsal longitudinal groove of the diaphysis is very marked. The distal foramen is located distally. The diaphysis gradually broadens towards the distal

epiphysis. The largest distal breadth is located up to the epiphyseal suture line.

The body size of the San Teodoro auroch is smaller than that of *Bos primigenius* and is within the range of variation of *Bos primigenius siciliae* as described by Brugal (1987).

Perissodactyls

Equus hydruntinus Regalia, 1904. This small horse is represented by a maxillar fragment including the tooth row from M\2 to P\2, 3 upper molars, 6 upper premolars, 2 mandibular fragments, 4 lower molars, 5 lower premolars, 5 incisors, 1 distal fragment of tibia, 1 complete right metacarpal bone, 1 proximal fragment of right metacarpal bone, 1 left metatarsal bone, 1 first phalanx, 2 second phalanxes, 1 third phalanx.

Teeth are small and lightly built. Upper cheek teeth have a short protocone. Lower cheek teeth have a double pli caballin similar to ass type. Limb bones are slender.

Proboscideans

Elephas mnaidriensis A.L. Adams, 1870. The elephant is represented by a fragment of juvenile mandible, 6 isolated molars, 2 limb bone fragments. Two juvenile molars (ST98PL 180 and ST98PL 4640) are worn on

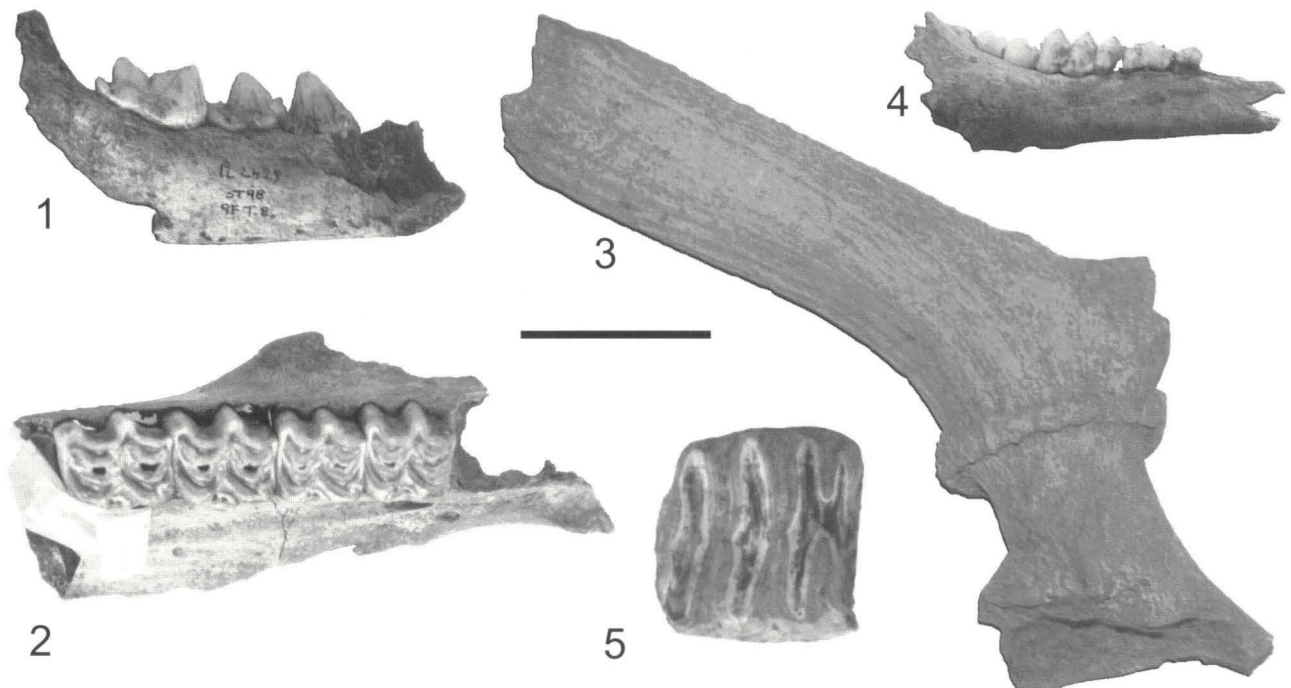
anterior laminae; the most posterior laminae lack. A worn molar fragment belonging to an adult specimen is also preserved. Morphological features and biomechanical data let us to identify these specimens as *Elephas mnaidriensis* (Ambrosetti, 1968; Bonfiglio & Berdar, 1979).

SMALL MAMMALS

Rodents

Apodemus sylvaticus (Linné, 1758). This mouse is the second taxon in abundance among small mammals. It is represented by several mandibles with incomplete molar series (M/1 being the most represented element) by a lesser number of maxillary fragment and isolated teeth. The morphology and the size are quite comparable to those of *Apodemus sylvaticus* which is a rather common taxon in the last glacial assemblages of southern Italian peninsula.

Microtus (Terricola) ex gr. savii (De Selys Longchamp, 1838). The Savi ground vole is by far the most abundant species among small mammals, as usual for Sicilian localities in which this vole is present (see also Bonfiglio *et al.*, 1997; Tagliacozzo, 1993). The remains consist of mandibular specimens, some maxillaries and mainly of lower and upper isolated teeth. The upper third molar is of 'simple' type,



Text-fig. 3 - 1) *Crocuta crocuta spelaea*, left mandible, internal view; 2) *Equus hydruntinus*, maxilla, occlusal view; 3) *Cervus elaphus siciliae*, right antler, internal view; 4) *Cervus elaphus siciliae*, right mandible, internal view; 5) *Elephas mnaidriensis*, molar, occlusal view. Scale bar = 5cm.

the anteroconid complex of M/1 is rather short, massive, and rather asymmetric, the connection between the T/4-T/5 rhombus and the anterior part of the anteroconid is wide. These features allow to refer the San Teodoro population to *Microtus (Terricola) ex gr. savii*. *Microtus (Terricola) ex gr. savii* is present in Sicily in localities, or stratigraphic horizons, of the late part of the last glacial cycle; an endemic subspecies [*M. (T.) savii nebrodensis* (Minà Palumbo, 1868)] is still widespread in the island nowadays. The Savi vole is a common occurrence since Tyrrhenian in southern Italian peninsula, which represented a refugium area for this species during the last glacial cycle.

Insectivores

Erinaceus cf. europaeus Linné, 1758. The hedgehog is represented by some isolated teeth of rather large size. The specific determination is affected by some uncertainties and is made mainly by analogy with better preserved specimens from other localities of Sicily which yielded a fully comparable small mammal assemblage (e.g. Contrada Pianetti). *E. europaeus* is still present in Sicily.

Crocidura cf. sicula Miller, 1900. This shrew is represented mainly by mandibular branches and by very rare upper teeth. The uncoloured teeth, the morphology of M/3 and P/4 and of the mandibular condyle allow the generic recognition. The smaller size and the morphology of the ascending ramus of the mandible separates these specimens from *Crocidura esuae*, the shrew occurring in Sicily within the *Elephas falconeri* and *Elephas mnaidriensis* assemblages and permit to refer it to the extant *Crocidura sicula*. Even though *Crocidura sicula* is considered an endemic species for the Sicilian archipelago, it likely represent a derivation from *Crocidura* population which dispersed late in the island and it apparently substituted the larger and more endemised *C. esuae*.

Bats

Gen. et sp. indet. Some large sized fragment of mandibles and upper molars permit to identify the occurrence of at least one species of large sized (*Myotis* - like) bat.

DISCUSSION

The 1998 research in San Teodoro Cave has produced novelties on taphonomy and biochronology of Quaternary mammals in Sicily. The most important issue concerning the fauna is the occurrence of not endemic micromammals and of *Equus hydruntinus* associated to endemic large mammal taxa.

According to previous knowledge Sicily was thought to have been populated by four vertebrate faunal complexes. The most recent one (Castello

F.C.), Late Glacial in age, includes 'mainland' taxa frequently associated to lithic industries of Epigravettian culture (see Bonfiglio *et al.*, 2000 and Tab. 2) while the preceding complex (*Elephas mnaidriensis* F.C.), late Middle Pleistocene-part of Late Pleistocene in age (Bonfiglio, 1987 b; Bada *et al.*, 1991; Rhodes, 1996), includes endemic mammals. In particular small mammals belonging to this Complex are highly endemic taxa (*Leithia melitensis*, *Maltamys cf. wiendincitensis*, *Crocidura esuae*; Kotsakis, 1996; Bonfiglio *et al.*, 1997; Di Maggio *et al.*, 1999) descendent from an earlier phase of population (*E. falconeri* F.C., early Middle Pleistocene).

Apodemus cf. sylvaticus, *Microtus (Terricola) ex gr. savii*, *Crocidura cf. sicula*, which represent a completely renewed small mammal assemblage, with scant or absent endemic features, are present in the island in Late Glacial (Castello F.C.) and in early Holocene assemblages (Uzzo cave, North - Western Sicily; Tagliacozzo, 1993). They have been also recently found at Contrada Pianetti (Ragusa, South-Eastern Sicily, Bonfiglio *et al.*, 1997) and in the upper levels of site K22 (S. Vito Lo Capo, Western Sicily, Petruso, 1996; Di Maggio *et al.*, 1999) associated to some endemic large mammal taxa, thus forming an assemblage which has been possibly considered representative of a new Faunal Complex, a little older in age than the Castello F.C. by Bonfiglio *et al.*, (1997; 2000). This small mammal fauna apparently does not include any of the endemic small mammal taxa present in older Sicilian faunal complexes and is very poor in diversity respect to the assemblages known from the late Middle and Late Pleistocene of the Italian Peninsula, taxa such as *Clethrionomys*, *Microtus (Microtus) arvalis* and *agrestis*, Soricinae shrews, Talpidae and dormice being absent.

In unit B at San Teodoro Cave, *Equus hydruntinus*, a taxon up to now considered exclusive of the Late Glacial Castello F.C., and a small mammal assemblage fully comparable with those recovered at Contrada Pianetti and K22, are associated to some large mammal species previously considered as typical of *E. mnaidriensis* F.C. (*Elephas mnaidriensis*, *Bos primigenius siciliae*, *Cervus elaphus siciliae*, *Crocota crocuta spelaea*). The faunal assemblage of San Teodoro Cave therefore confirms the occurrence in Sicily of a new faunal complex in which some endemic survivors of the *E. mnaidriensis* F.C. are associated to 'continental' non endemic taxa which dispersed into the island before the Late Glacial.

Since endemic dormice and *Crocidura* are still present in the *E. mnaidriensis* F.C. faunal assemblage at Contrada Fusco, in deposits which are older than Tyrrhenian high stand (isotopic stage 5e of $\delta^{18}\text{O}$ stratigraphy; Chilardi & Gilotti, 1996), we are inclined to interpret the absence of endemic dormice and shrew and the occurrence of non endemic small mammals and of the ass in Unit B as documenting a younger age than Tyrrhenian. The dispersal events

contiguous faunal complexes (*Elephas mnaidriensis* and Castello F.C.'s) can be explained by the occurrence of dispersal events posterior to isotopic stage 5e. These events, introduced in the island faunal elements from the mainland (*Equus hydruntinus*, *Apodemus* cf. *sylvaticus*, *Microtus* (*Terricola*) ex gr. *savii*, *Crocidura* cf. *sicula*) which dwelled together with some endemic survivors (*Elephas mnaidriensis*, *Cervus elaphus siciliae*, *Bos primigenius siciliae*). This data therefore seem to confirm, and better document, the occurrence of a new population phase, or faunal complex, in the Pleistocene of Sicily which age is comprised between those of the *Elephas mnaidriensis* complex (late Middle Pleistocene – Late Pleistocene) and of the Castello F.C. (Late Glacial).

- 4 - The unusual taphonomic features related to hyena frequentation during the deposition of Unit B are fairly identical to those known for other cave deposits in African and European regions, and apparently reinforce the scant insular character of ecological conditions related to this new faunal complex.

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