

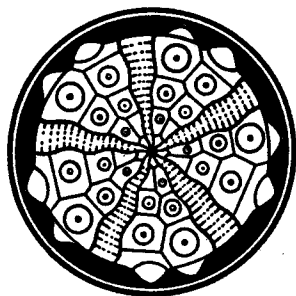
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Late Villafranchian faunas in Italy: the Casa Frata Local Fauna (Upper Valdarno, Tuscany) (*)

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KEY WORDS — Mammal faunas - Late Villafranchian - Upper Valdarno - Italy - Pleistocene biochronology.

ABSTRACT — A revision of some faunal elements from the locality Casa Frata has been carried on. The updated faunal assemblage is: «Lepus» *etruscus*, *Canis etruscus*, *Canis falconeri?*, *Vulpes sp.*, *Ursus etruscus*, *Martes sp.*, *Pachycrocuta brevirostris*, *Lynx issiodorensis*, *Acinonyx pardinensis*, *Homotherium crenatidens*, *Archidiskodon meridionalis*, *Eucladoceros sp.*, «Dama» *nestii*, cf. *Praeovibos*, «Leptobos» *vallisarni*, *Equus stehlini*, *Dicerorhinus etruscus*. Casa Frata is the fauna belonging to the Late Villafranchian Tasso Assemblage for which the homogeneity of the assemblage is the best controlled. The Tasso Assemblage apparently occurs only in the Upper Valdarno (Tuscany) and in Val di Chiana (Umbria). Its characterizing taxa are: *Canis arnensis*, *Canis falconeri*, «Leptobos» *vallisarni* and *Equus stehlini*.

Significant peculiarities have been recognized also in «Dama» *nestii* and *Eucladoceros*. The appearance of immigrant taxa suggests the occurrence of a climatic change.

RIASSUNTO — Viene fatta una messa a punto della fauna di Casa Frata portando nuovi contributi alla conoscenza di alcuni taxa. La composizione della fauna risulta essere la seguente: «Lepus» *etruscus*, *Canis etruscus*, *Canis falconeri?*, *Vulpes sp.*, *Ursus etruscus*, *Martes sp.*, *Pachycrocuta brevirostris*, *Lynx issiodorensis*, *Acinonyx pardinensis*, *Homotherium crenatidens*, *Archidiskodon meridionalis*, *Eucladoceros sp.*, «Dama» *nestii*, cf. *Praeovibos*, «Leptobos» *vallisarni*, *Equus stehlini*, *Dicerorhinus etruscus*. Quella di Casa Frata è la fauna geologicamente meglio controllata fra quelle ascrivibili all'Associazione Tasso del Villafranchiano Superiore. L'Associazione Tasso sembra essere presente solamente nel Valdarno Superiore e in Val di Chiana ed è caratterizzata dalla presenza di *Canis arnensis*, *Canis falconeri*, «Leptobos» *vallisarni* e *Equus stehlini*. Sono state riconosciute peculiarità significative nei cervidi. La presenza di nuovi immigranti suggerisce l'esistenza di cambiamenti climatici.

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FOREWORD

A preliminary description of the fossil fauna from Casa Frata, field geology data, and local stratigraphy have been reported by Borselli *et al.* (1980). The site is located at about 210 m above sea level, at the eastern side of the Upper Valdarno Basin, near Terranuova Bracciolini (Tuscany). All the fossils have been collected from a level of sands and small conglomerate lenses just below the coarse conglomerate representing the uppermost part of the section outcropping in the Casa Frata area. The sediments belong to the second sedimentary phase which interested the basin and are of Early Pleistocene age (Abbate, 1983; De Giuli, 1983a). They are referred to the Montevarchi Group which is divided, from the oldest to the youngest, into three formations: Terranuova silts, Ascione clays and Oreno formation. The last one is made of sandy clays and silts, yellow sands and conglomerate lenses. The Oreno formation

becomes more sandy at the top, near the base of the overlying coarse conglomerates referred to the Groups of the Pratomagno and Chianti fans. Whether these conglomerates represent the end of the second sedimentary phase or the beginning of a new phase has not yet been established. Anyhow they testify a strong erosive action in the nearby mountains. This could be related to a tectonic uplifting of the area but possibly reflects also a climatic evolution towards more arid and cool conditions (Cicali *et al.*, 1983).

The sandy horizon that yielded the Casa Frata local fauna is in the uppermost part of the Oreno formation.

THE FAUNAL ASSEMBLAGE OF CASA FRATA

The list of the Casa Frata fauna has been already communicated by Borselli *et al.* (1980), where the occurrence of the typical features of

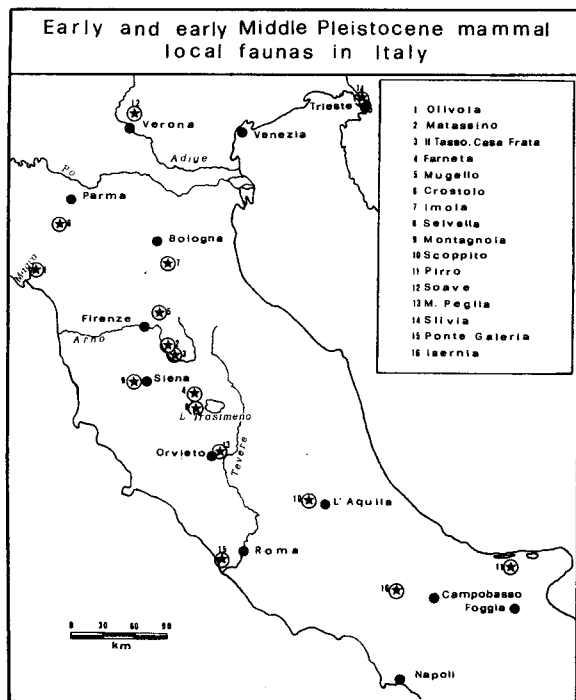
the Tasso Assemblage was stressed. The faunal list has been somewhat changed by further studies.

A revision of the Ovibovini remains has been made by De Giuli & Masini (1983), while the remains of the leporid have been reconsidered by De Giuli & Torre (1984), and De Giuli *et al.* (1986). *Acinonyx* has been studied in detail by Ficarelli (1984). In the present paper also the equid, deer and *Leptobos* remains have been briefly reconsidered. Data on the carnivores, except *Acinonyx*, and on *Dicerorhinus* and *Archidiskodon* are briefly summarized here according to Borselli *et al.* (1980).

LAGOMORPHA

«*Lepus*» *etruscus* (Bosco)

The mandible of leporid referred to *Lepus valdarnensis* by Borselli *et al.* (1980) is to be classified as «*Lepus*» *etruscus* Bosco. De Giuli & Torre (1984) and De Giuli *et al.* (1986) pointed out that the taxonomy of the Villafranchian and Middle Pleistocene leporids of Italy needs a revision. However, the authors retain that the paleontological evidence warrants to consider «*Lepus*» *etruscus* Bosco (1900), based on a small sized mandible from Il Tasso, a valid species. Viret (1951), considered this species a junior synonym of «*L.*» *lacosti* and «*L.*» *valdarnensis*, regarding the small sized type of «*L.*» *etruscus* as a young individual. In fact, small sized «*Lepus*» remains have been recovered not only at Il Tasso but also at Le Strette and now at Casa Frata in the Upper Valdarno, and in the latest Villafranchian site of Pirro Nord. These finds support the hypothesis that a «*Lepus*» smaller than «*L.*» *lacosti* and «*L.*» *valdarnensis* was in existence.



CARNIVORA

Canis etruscus

This species is represented by two mandibular rami, isolated teeth and several limb bone remains belonging to at least three individuals. This Villafranchian wolf is the best documented carnivore at Casa Frata.

Canis falconeri (?)

The remains consist of only a radius and a fragment of the pelvis. The taxonomic assessment of this form has been based mainly on the very large size of the specimens, that make the attribution to the large *Canis falconeri* very likely.

Vulpes (?) sp.

A fragment of tibia and ribs have been referred to *Vulpes* for their very small size, smaller than *Canis arnensis*.

Ursus etruscus

A left mandibular ramus. The morphology of the teeth and of the mandible are typical of *U. etruscus*.

Martes sp.

This mustelid is represented by two mandibular rami lacking the ascending rami. Differences in size and dental morphology suggest that we are facing a different species than the living *Martes martes*. This is the first find of *Martes* in a Late Villafranchian locality of Italy.

Pachycrocuta brevirostris

This large hyaena is represented by three mandibles which, for the different size and wear of teeth, demonstrate the occurrence of three individuals.

Lynx issiodorensis

A fragmentary maxillary bone, isolated teeth and several fragments of limb bones testify the occurrence of this species that is frequent in Late Villafranchian sites.

Acinonyx pardinensis

The cheetah is represented by a right femur, a tibia, a fourth metacarpal and the proximal part of a third metacarpal. It is the first find of *Acinonyx* from the Tasso Assemblage. See Ficarelli (1984), for an exhaustive report.

Homotherium crenatidens

A lower carnassial and a fragment of pelvis demonstrate the occurrence of an aged individual.

fossiliferous horizon in the locality Farneta and on a misinterpretation of the equid from Gioiella as *E. stenonis*. In fact Gioiella is a wrong toponim for the site Selvella where an evolved horse occurs, referred to *E. cf. stenonis* but clearly close to *E. sussenbornensis* (De Giuli, 1986). In our opinion a time difference between *E. stenonis* and *E. stehlini* cannot be excluded.

PERISSODACTYLA

Equus stehlini pl. 2, fig. 5-9

The equid specimens occurring at Casa Frata are mainly metapodials. No skulls have been found and only a few, strongly worn, lower cheek-teeth are present. The specimens form a homogeneous group. They show clear stenonoid features when plotted according to Eisenmann (1979) (text-fig. 2) and differ from *Equus stenonis* mainly in their smaller size. This species can be identified as *E. stehlini*. Azzaroli (1965) described this new species on the basis of skulls from the Upper Valdarno and referred to it limb bones of small size occurring in the old I.G.F. collections. It is the first time that an homogeneous group of bones is found in a well defined layer. *E. stehlini* also occurs in the Casa Palazzi quarry together with «*L.*» *vallisarni*.

One of us already pointed out (in Borselli *et al.*, 1980) that in no recently discovered and well sampled locality *E. stehlini* occurs together with *E. stenonis*. No further evidence of a possible coexistence of the two horses has been found. Azzaroli (1982) suggested that the two species could have lived in different biotopes. Privat (1986) followed this view, but her conclusions are mainly based on the assumption (in our opinion not demonstrated) of the existence of a single

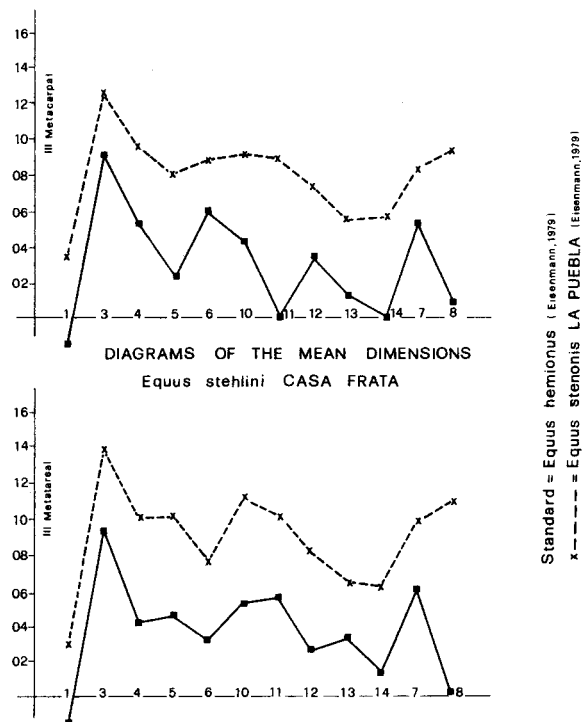


Fig. 3 - Diagram of the differences of the mean dimensions logarithms of the III metapodials: *Equus stehlini* from Casa Frata compared with *E. stenonis* from La Puebla de Valverde; standard = *Equus hemionus*. Data for *Equus stenonis* and method according to Eisenmann, 1979.

Dicerorhinus etruscus

The remains of at least three individuals, characterized by a fairly large size and stocky proportions have been recovered. It is possible that the rhino of Casa Frata could be distinguished, at a sub-specific level, from the rhino occurring at Matassino.

Micromammals from this locality are unknown, but remains of *Mimomys savini* have been recovered at Case Inferno, which can be confidently considered to represent the same horizon as Casa Frata, and at Le Strette (Torre, 1985).

PLATE 1

Eucladoceros sp.; fig. 1 - right metacarpal IGF 5964V; fig. 2 - right mandible IGF 1859V, a, lateral view, b, occlusal view. «*Dama*» *nestii*; fig. 3 - right metacarpal IGF 704V; fig. 4 - right metatarsal IGF 1864V; fig. 5 - right metatarsal IGF 703V; fig. 6 - fragment of right antler IGF 693V; fig. 7 - right mandible IGF 720V, a, occlusal view, b, medial view; fig. 8 - right mandible IGF 1860V.

Figures 2, 7a and 8, about natural size; figs. 1, 3, 4, 5, 6 and 7b, about one half nat. size.

THE SIGNIFICANCE OF THE CASA FRATA FAUNA AMONG THE ITALIAN LATE VILLAGRANCHIAN FAUNAS

The stratigraphic position of the Tasso Assemblage faunas in the late Villafranchian sequence has been discussed by several authors (Azzaroli, 1977; De Giuli *et al.*, 1983). At present no reliable data for calibrating the age of the Tasso Assemblage on the geochronologic scale are available, but only indirect correlations are possible. An age comprised between the two paleomagnetic events Olduvai and Jaramillo can be stated. The possible correlation of the fauna from Sainzelles with Selvella and Pirro Nord, which are younger than the Tasso Assemblage, give a possible age not younger than 1.3-1.4 M.A. (Torre, 1985, De Giuli *et al.*, 1986).

The Tasso Assemblage faunas differ from the Olivola ones, besides the already quoted «*Leptobos vallisarni*, *Equus stehlini*, the coyote *Canis arnensis* and the lycaonid-like *C. falconeri*, for the occurrence of the small «*Lepus*» *etruscus*, *Eucladoceros* sp., an evolved ovibovini and also *Hippopotamus*, according to Blandamura & Azzaroli (1977). The *Lynx* is possibly smaller than that of Olivola. To understand the meaning of the faunal changes which occurred between the two units it may be useful to distinguish as a hypothesis, two different groups of species:

1 - species which are different for their adaptation or evolutionary stage from the ones of the older assemblage, but which can be assumed to have originated in the same faunal province;

2 - species which have not been found before in western Europe and which are likely to be newcomers from different provinces.

To the first group of species possibly belong the small leporid, the *Lynx* and the *Eucladoceros*.

The leporid differs from the older «*Lepus*» *lacosti-valdarnensis* mainly for its smaller size. It seems likely that this lineage of small leporids sur-

vived up to the latest Middle Pleistocene, as the finds from Salento suggest, before becoming extinct (De Giuli *et al.*, 1986; De Giuli, 1983b). Also the lynx differs from the St. Vallier, and possibly from the Olivola one, for its smaller size. According to Ficcarelli & Torre (1977), this size reduction could be interpreted as an advanced feature, since an overall trend towards small size characterizes the evolution of *Lynx issiodorensis*. This species is the most likely ancestor of the small *Lynx pardina*, at present spread only in the Spanish Peninsula. The small *Eucladoceros* is still too poorly known but its possible origin in western Europe seems likely.

To the second group of species possibly belong *Canis falconeri*, *Canis arnensis* and the ovibovine. These three species likely reached the Italian peninsula migrating from eastern regions.

More difficult to evaluate is the provenance of the bovine «*Leptobos*» *vallisarni* and of the small *Equus stehlini*.

The first one shows more advanced skull features than the typical *Leptobos etruscus* from Olivola and Matassino. At present it seems well documented only in the Tasso faunas. A possible origin of this species in the west European regions cannot be excluded. However, if its similarity to the primitive *Bison*-like Bovini, which most likely originated in the eastern regions of Eurasia is due to close phylogenetic relationships, the hypothesis that also bovine is a new-comer is fairly likely.

Equus stehlini is considered by Azzaroli (1982) and Privat (1986) a local possible derivative from *E. stenonis* from which it differs mainly for a reduction in size, possibly due to a different adaptation. Anyway at present a possible monophyletic origin of the Upper Villafranchian small horses of Eurasia outside the Western Europe faunal province and a migration to the west cannot be definitely excluded.

This analysis suggests that the Tasso Assemblage faunas possibly document the occurrence of a spell of climatic deterioration that took place during part of the Eburonian pollen zone (De Giuli *et al.*, 1983). This is evidenced by the migrations of taxa previously unknown in the west European regions. If the hypothesis of an eastern provenance of the new-comers is true an evolution towards a less forested landscape can be confidently inferred also in the Italian Peninsula. The occurrence of changed environmental conditions is also suggested by the body-size reduction in forest dwellers like *Eucladoceros* sp. and the lynx.

At present it is difficult to state if this change should be considered a sign announcing the beginning of the faunal turnover which occurred at the end of the Villafranchian, but the occurrence of at least three taxa migrated from different faunal provinces supports this hypothesis.

The relationships between the Tasso faunas and those grouped in the Farneta unit are not fully clear. As a matter of fact these localities often yielded very scant or little differentiated

assemblages, with the exception of Pirro Nord and Selvella, and put forth difficulties even in the mere taxonomic assessment of the assemblages.

They all retain clear Villafranchian features, but document also the occurrence of new taxa, likely new-comers, whose migration events are difficult to place in a stratigraphic succession. A group of species in the Farneta's faunas undergo evolutive changes (e.g. *Archidiskodon meridionalis*, which is documented by the derived subspecies *A.m. vestinus*, and the small deer «*Dama*» *nestii*, that shows clearly apomorphic features at Pirro Nord). On the other hand new species, like the very large *Eucladoceros* sp. from Pirro Nord and Selvella, a large «*Leptobos*» from Selvella and the *Eobison* from Pirro Nord occur. A reliable reconstruction of the events of this latest Villafranchian can only be done after an accurate revision of both the geology and the faunal assemblages of the more significant localities.

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