

CARNIAN/NORIAN HALOBIIDS FROM PIZZO MONDELLO SUCCESSION (SICANI MOUNTAINS, SICILY)

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During the Upper Triassic, it appears that despite new originations, the general decline in biodiversity was punctuated by a series of accelerated steps between the Carnian and the Rhaetian. Pizzo Mondello (Sicani Mountains, Western Sicily, Italy) is one of the best sections spanning a Carnian/Norian boundary interval. The 450 m thick pelagic-hemipelagic limestone succession exposed in this locality belongs to the Calcarei con selce (Halobia limestone Auctorum; Cherty Limestone, MUTTONI et al. 2001, 2004) and shows a combination of great thickness, almost uniform facies, good exposure and easy accessibility, which makes this site perfect for sampling and study.

The Calcarei con selce of western Sicily has been well known for its exceptionally rich and well preserved Late Carnian to Early Norian ammonoid fauna originally studied by G.G. GEMMELLARO (1904), as well as for the very rich halobiid bivalve record, studied by various authors in the past centuries (GEMMELLARO, 1882; MONTANARI & RENDA, 1976; CAFIERO & DE CAPOA BONARDI, 1982; DE CAPOA BONARDI, 1984).

The Pizzo Mondello succession is of great interest for the definition of the GSSP of the Norian stage, and two years ago a large group of specialists started new investigations aimed at the biostratigraphic calibration of the magnetostratigraphy and carbon isotope variations (MUTTONI et al. 2001, 2004) with conodonts, ammonoids, halobiids and radiolarians (GUAJUMI et al. 2007; NICORA et al. 2007; BALINI et al. 2008). The study of halobiids is still in progress, but here we provide new data. The halobiid bed-by-bed sampling was done, for the first time in this locality, in spring 2007 and February and May, 2008. Only the first 140 meters of the succession, straddling the Carnian/Norian boundary were sampled. The available material consists of about 650 halobiid specimens, most of them well to very well preserved, coming from about 100 levels.

From the Carnian/Norian interval we recognize ten halobiid species with biochronologic significance: *Halobia carnica*, *H. lenticularis*, *H. austriaca*, *H. simplex*, *H. superba*, *H. radiata*, *H. cf. beyrichi*, *Halobia* of the group of *H. areata*, *H. styriaca* and *H. mediterranea*. Among these species, three have a great importance for the definition of the Carnian/Norian boundary interval. The relevance of *Halobia styriaca* has already been discussed in NICORA et al. (2007). The finding of the species *Halobia cf. beyrichi* is of particular interest since it is

considered to be a marker of the Lower Norian both in North America (lower part of the *Kerri* Zone) and in the Tethyan realm (upper part of the Jandianus Zone; KRYSTYN & GALLET, 2002). This important form was already reported from this site by KRYSTYN & GALLET (2002), and now its range is calibrated within the halobiid succession. The group of *H. areata*, typical of the Lower Norian of other Tethyan localities, is reported for the first time from Sicily, and it is useful for both definition of the Carnian-Norian boundary interval and correlations.

The ten species have been subdivided in six assemblages (from base to top):

1. *Halobia carnica* assemblage, with the species *H. carnica* and *H. lenticularis*. It is the oldest fauna of the succession;
2. *Halobia lenticularis* assemblage, with the species *H. lenticularis*, *H. austriaca*, *H. simplex* and rare *H. superba*. It is based on the disappearance of *H. carnica*, and indicates the last surely Carnian assemblage;
3. *Halobia radiata* assemblage, with the species *H. radiata* and subordinate *H. austriaca*, *H. simplex* and *H. superba*. It represents a transition fauna between Carnian and Norian groups;
4. *Halobia cf. beyrichi* assemblage, with the species *H. cf. beyrichi* and rare *H. areata*-group and *H. radiata* specimens. It is the first surely Norian assemblage;
5. *Halobia styriaca* assemblage, with only *H. styriaca* specimens. It marks the upper part of the first zone of the Norian (upper *Kerri* Zone in North America; upper *Jandianus* Zone in the Tethyan realm; KRYSTYN & GALLET, 2002);
6. *Halobia mediterranea* assemblage, with only *H. mediterranea* specimens. It is the youngest fauna found at Pizzo Mondello.

These assemblages, and in particular the newly calibrated ranges of *Halobia cf. beyrichi* and *Halobia* of the group of *H. areata* will prove to be very useful tools in the biostratigraphic correlation between North American and Tethyan successions.

References

- BALINI M., BERTINELLI A., DI STEFANO P., DUMITRICA P., FURIN S., GULLO M., GUAIUMI C., HUNGERBUEHLER A., LEVERA M., MAZZA M., MCROBERTS C.A., MUTTONI G., NICORA A., PRETO N. & RIGO M. (2008): Integrated stratigraphy of the Norian GSSP candidate Pizzo Mondello section (Sicani Mountains, Sicily). - *Berichte Geol. Bundesanst.*, **76**, 23-25, Wien.
- CAFIERO B. & DE CAPOA BONARDI P., 1982. Biostratigrafia del Trias pelagico della Sicilia. - *Boll. Soc. Paleont. It.*, **21**(1), pp. 35-71, Modena.
- DE CAPOA BONARDI P., 1984. *Halobia* zones in the pelagic Late Triassic sequences of the Central Mediterranean area (Greece, Yugoslavia, Southern Apennines, Sicily). *Boll. Soc. Paleont. It.*, **23**, pp. 91-102, Modena.
- GEMMELLARO G.G. (1882): Sul Trias della regione occidentale della Sicilia. - *Mem. Acc. Lincei*, s. 3, **12**: 451-473, Palermo.

GEMMELLARO G.G. (1904): I cefalopodi del Trias superiore della regione occidentale della Sicilia. - *Giornale di Scienze Naturali ed Economiche*, **24**: 1-319, Palermo.

GUAIUMI C., NICORA A., PRETO N., RIGO M., BALINI M., DI STEFANO P., GULLO M., LEVERA M., MAZZA M. & MUTTONI G. (2007): New Biostratigraphic data around the Carnian/Norian boundary from the Pizzo Mondello Section, Sicani Mountains, Sicily. *New Mexico Mus. of Nat. His. and Sci., Bull.* **41**: 40-42, Albuquerque.

MONTANARI L. & RENDA P., 1976. Biostratigrafia del Trias del Monte Triona (Sicani). - *Boll. Soc. Geol. It.*, **95**, pp. 725-744, Roma.

MUTTONI G., KENT D.V., DI STEFANO P., GULLO M., NICORA A., TAIT J. & LOWRIE W. (2001): Magnetostratigraphy and biostratigraphy of the Carnian/Norian boundary interval from the Pizzo Mondello section (Sicani Mountains, Sicily). - *Palaeogeography, Palaeoclimatology, Palaeoecology*, **166**: 383-399, Amsterdam.

MUTTONI G., KENT D.V., OLSEN P.E., DISTEFANO P., LOWRIE W., BERNASCONI S.M. & HERNANDEZ F.M. (2004): Tethyan magnetostratigraphy from Pizzo Mondello (Sicily) and correlation to the Late Triassic Newark astrochronological polarity time scale. - *Geol. Soc. Amer. Bull.*, **116**: 1034-1058, Tulsa.

NICORA A., BALINI M., BELLANCA A., BERTINELLI A., BOWRING S.A., DI STEFANO P., DUMITRICA P., GUAIUMI C., GULLO M., HUNGERBUEHLER A., LEVERA M., MAZZA M., MCROBERTS C.A., MUTTONI G., PRETO N., RIGO M. (2007): The Carnian/Norian boundary interval at Pizzo Mondello (Sicani Mountains, Sicily) and its bearing for the definition of the GSSP of the Norian Stage. - *Albertiana*, **36**: 102-129, Utrecht.