A LARGE CLAVATULID SPECIES FIRST REPORTED FROM THE EARLY PLIOCENE OF ITALY (GASTROPODA, NEOGASTROPODA, CONOIDEA)

V. SPADINI[1] & G. MANGANELLI[2]

[1]Via Toti 4, 52046 Lucignano, Italy
[2]Dipartimento di Scienze Ambientali, Università di Siena, Via Mattioli 4, 53100 Siena, Italy

Abstract *Shells of a species of* Perrona*, a genus never reported before from the Pliocene of Italy, were collected in the Early Pliocene of southern Tuscany over the last twenty years. These shells recall those of* P. villarrasensis *Vera-Peláez & Lozano-Francisco 2001, from the Early Pliocene of southern Spain, by virtue of shape, size and development of parietal callus. However the poor condition of available material and the lack of a reliable taxonomic framework for this group of Euro-Mediterranean fossil clavatulids make it difficult to propose a realistic determination.*

The finding of a species of Perrona *in the Pliocene of Italy is very interesting. During the Miocene species of* Perrona *were common and widespread in the Euro-Mediterranean area, but in the Early Pliocene only four species survived in southern Spain and records from the eastern Mediterranean are limited to one from Tunisia and the present from southern Tuscany.*

Key words *Clavatulidae*, Perrona, *Mediterranean, Pliocene, distribution, biogeography*.

INTRODUCTION

Shells of a moderately large, stout clavatulid, with inconspicuous ornamentation have been collected in two Pliocene outcrops of southern Tuscany over the last twenty years. They belong to a species never before reported from the Pliocene of Italy, despite intensive research carried out on the Italian Pliocene malacofauna, especially conoidean gastropods (for example, recent monographs on conoidean gastropods from Emilia-Romagna and Tuscany by Chirli, 1997, and Scarponi & Della Bella, 2003, 2007). Unfortunately the available material is scarce, incomplete and worn, making satisfactory comparison with other taxa of the group very difficult. Besides the poor condition of our specimens, the absence of a reliable taxonomic framework for the group of Euro-Mediterranean fossil clavatulids is another reason which makes it difficult to propose a species level determination for this rare and interesting taxon.

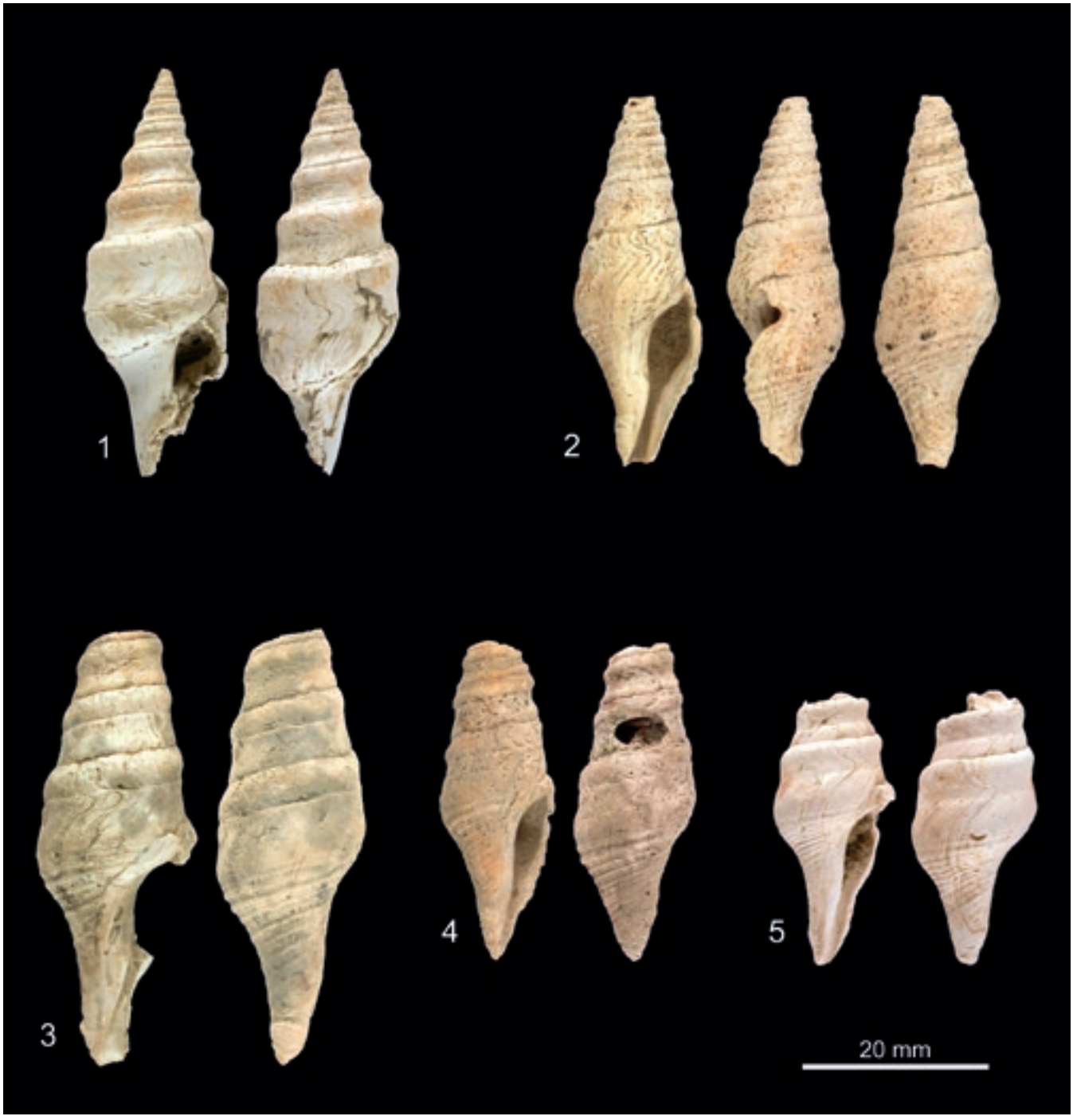
DESCRIPTION OF MATERIAL

Description Adult shell (Figs 1–5) moderately large in size, robust, fusiform with at least 9–10 rather flat whorls (protoconch and early teleoconch whorls always worn), separated by irregular wavy adpressed sutures; first teleoconch whorls biconvex in outline, with smooth adapical sutural cordon, wide median shallow groove (shoulder sulcus; anal fasciole) and roughly nodular abapical sutural cordon; last ones sigmoid in outline, with smooth adapical sutural cordon and gently concave abapical portion; last whorl large, about half total height, biconvex in outline, with smooth broadly rounded subsutural cordon (collar), median shallow groove (shoulder sulcus; anal fasciole), smooth broadly rounded basal angulation and short stout conical siphonal canal; spiral sculpture consisting of irregular thin cords which become less evident in the last whorl (in one specimen well evident in median groove of first whorls, see Fig. 1), sometimes a sort of scar bordering impressions of adapical edge of anal sinus, and about 10–15 irregular cords alternating to narrow grooves in basal portion of last whorl; axial sculpture consisting of slightly evident collabral growth lines; aperture narrow continuing with elongate siphonal canal and bordered by parietal callus and sharp outer lip; parietal callus with small tubercle near upper vertex; outer lip with deep anal sinus below adapical subsutural cordon and very shallow abapical notch at about half siphonal canal.

Dimensions The largest specimen consists of an incomplete shell measuring 46 mm in height and 17 mm in last whorl diameter. When complete, it could have been 55–60 mm high.

Material examined Fosso Fusola, right slope near the bridge on the road between Ville di Corsano

Contact author : spadiniv@inwind.it



Figs 1–5 Shells of *Perrona* cf. *villarrasensis* Vera-Peláez & Lozano-Francisco 2001, from Early Pliocene of Lucciola Bella (Figs 1–4) and Fosso Fusola (Fig. 5), southern Tuscany, Italy (Figs 1, 3, 4 VSP; Figs 2, 5 GMC).

and Radi (municipality of Monteroni d'Arbia, UTM reference 32TPN9187), gray silty shales and silts (2 sh, GMC). Lucciolabella (municipality of Pienza, UTM reference 32TQN2568), gray silty shales, silts and re-sedimented sandstones (4 sh, VSC; 1 sh, GMC).

Discussion

Fossil Euro-Mediterranean clavatulids with inconspicuous ornamentation are usually assigned to the Recent genus *Perrona* Schumacher 1817 (type species: *Perrona tritonium* Schumacher

1817; *P. tritonium* is a junior synonym of *Murex perron* Gmelin 1791), regarded as a subgenus of *Clavatula* (type species: *Clavatula coronata* Lamarck 1801) by some (Mikuž, 1998) and as a distinct genus by others (Powell, 1966; Lozouet *et al*., 2001; Vera-Peláez & Lozano-Francisco, 2001a; Bałuk, 2003; Rolán *et al*., 2008). The inclusion of these species in *Perrona* was first proposed by Bellardi (1877), who nevertheless emphasised that the distinction between *Clavatula* and *Perrona* was easy in the species, but it becomes impossible when the many fossil species are taken into consideration; for this he regarded *Perrona* as a mere section of *Clavatula* including species without axial ornamentation. Despite Bellardi's clear statement, the question has not been addressed and clear differential diagnosis between the two taxa is still not available today, the attribution of fossil species to one or another genus/subgenus is often quite arbitrary, and it is unlikely that the two groups of Euro-Mediterranean fossil species are natural.

As currently conceived, *Perrona* includes about fifteen fossil Euro-Mediterranean species dating back from the Oligocene to the Pliocene (R. Janssen, 1979; A.W. Janssen, 1984; Mikuž, 1998; Vera-Peláez & Lozano-Francisco, 2001a, 2001b; Harzhauser, 2002; Bałuk, 2003; Tucker, 2004). However there are species with a marked ornamentation assigned to *Perrona* which could be *Clavatula* (cf. for example *P. czarnockii* Bałuk 2003) and species with inconspicuous ornamentation assigned to *Clavatula* which could be *Perrona* (cf. for example *C. kowalewskii* Bałuk 2003). Most of the Euro-Mediterranean *Perrona* species are poorly characterized (see the eleven species reported by Mikuž, 1998) and in need of a thorough revision (species from the Miocene of northern Italy have never been revised and those from the Miocene of Atlantic Europe have not been revised since Peyrot, 1931).

Four species have been reported from the Mediterrean Pliocene (Fekih, 1975; Vera-Peláez & Lozano-Francisco, 2001a, 2001b): *P. estebbunensis* Vera-Peláez & Lozano-Francisco 2001, *P. jouannetii* (Desmoulins 1842), *P. munizsolisi* Vera-Peláez & Lozano-Francisco 2001, and *P. villarrasensis* Vera-Peláez & Lozano-Francisco 2001, though one of these (*P. munizsolisi*) has subsequently been attributed to the genus *Clavatula* (cf. Vera-Peláez & Lozano-Francisco, 2001b). The one that best matches our specimens is *P. villarrasensis* due to its shape, size and development of parietal callus. To establish whether it is a valid species is beyond the scope of this note. Some shells (Figs 2, 4) are more slender and conical than others (Figs 1, 5) due to the fact that the adapical cordon is less inflated. We do not know whether this indicates intra-specific variation, sexual dimorphism or ecophenotypical variation, but we doubt that it supports the existence of two species in our material.

The finding of a species of this group of clavatulids in the Italian Pliocene is very interesting. Clavatulids were a very diversified group of conoidean gastropods in the Euro-Mediterranean area during the Miocene (see the classical monographs of Bellardi, 1877; Hoernes & Auinger, 1891; Peyrot, 1931), but their diversity reduced sharply at the end of the epoch. According to Vera-Peláez & Lozano-Francisco (2001a, 2001b), *Perrona* species were still widespread and abundant in the Early Pliocene of southern Spain. However their presence eastward in the Mediterranean was only occasional and limited to two records: one from Tunisia (Fekih, 1975) and the present from southern Tuscany. Vera-Peláez & Lozano-Francisco (2001a, 2001b) also quoted another record from eastern Mediterranean, but it is actually based on material from the Middle Miocene and not the Pliocene (cf. Erünal-Erentöz, 1958: 6, 101).

This seems to be another case of Early Pliocene Mediterrean molluscs with an exclusive or prevalent westward distribution, like the volutids *Cymbium* and *Scaphella* and the olivids *Amalda* and *Olivella* (Lozouet, 1992; Landau *et al*., 2006).

Acknowledgements

We are grateful to Antonella Daviddi for technical assistance, Viviana Fiorentino for the photos of the Figs 1–5, Helen Ampt for revising the English and Intidar Abbas, Marco Oliverio and the staff of the Library of the Faculty of Sciences of the University of Siena for helping with bibliographic research.

References

Bałuk W 2003 Middle Miocene (Badenian) gastropods from Korytnica, Poland; part IV-Turridae. *Acta Geologica Polonica* **53**: 29–78, 29 pls.

BELLARDI L 1877 I molluschi dei terreni terziarii del Piemonte e della Liguria. Parte II. *Memorie della Reale Accademia delle Scienze di Torino, Serie 2* **29**: 1–373.

CHIRLI C 1997 Malacofauna Pliocenica Toscana Superfamilia Conoidea. C. Chirli, Firenze.

ERÜNAL-ERENTÖZ L 1958 Mollusques du Néogène des Bassins de Karaman, Adana et-Hatay (Turquie). *Maden Tetkit ve Arama Enstitusu Yayinlarindan Serie C* **4**: 1–223, 36 pls.

FEKIH M 1975 Paléoécologie du Pliocène marin au nord de la Tunisie. *Annales des Mines et de la Géologie (Service Géologique de Tunisie)* **27**: 1–195, 62 pls.

HARZHAUSER M 2002 Marine and brachyhaline Gastropoden aus dem Karpatium des Korneuburger Beckens und der Kreuzstettener Bucht (Österreich, Untermiozän). *Beiträge zur Paläontologie* **27**: 61–159.

HOERNES R & AUINGER M 1891 Die Gasteropoden der Meeres-Ablagerungen der ersten und zweiten Miocänen Mediterran-Stufe in der Österreich-Ungarischenden Monarchie. *Abhandlungen der Kaiserlich-Königlichen Geologischen Reichsanstalt* **12** (7–8): 283–382, pls: 37–50.

JANSSEN AW 1984 Mollusken uit het Mioceen van Winterswijk-Miste. Een inventarisatie, met beschrijvingen en afbeeldingen van alle aangetroffen soorten. *Bibliotheek van de Koninklijke Nederlandse Natuurhistorische Vereniging* **36**: 1–451, pls 1–82.

JANSSEN R 1979 Die Mollusken des Oberoligozäns (Chattium) im Nordsee-Becken. 2. Neogastropoda, Euthyneura, Cephalopoda. *Archiv für Molluskenkunde* **109**: 277–376.

LANDAU B & MARQUES DA SILVA C 2006 The early Pliocene Gastropoda (Mollusca) of Estepona, Southern Spain. Part 9: Olividae. *Palaeontos* **9**: 1–21.

LOZOUET P 1992 New Pliocene and Oligocene Olividae (Mollusca, Gastropoda) from France and the Mediterranean area. *Mededelingen van de Werkgroep voor Tertiaire en Kwartaire Geologie* **29** (1–2): 27–37, 3 pls.

LOZOUET P, LESPORT J-F & RENARD F 2001 Révision des Gastropoda (Mollusca) du Stratoype de l'Aquitanien (Miocène inf.): site de Saucates "Lariey", Gironde, France. *Cossmanniana, Hors Série* **3**: 1–190.

MIKUŽ V 1998 Turridae (Neogastropoda) iz srednjemiocenskih badenijskih plasti Slovenije. *Geologija* (*Ljubljana*) **40**: 65–101.

PEYROT A 1931 Conchologie néogénique de l'Aquitaine (suite). *Actes de la Société Linnéenne de Bordeaux* **83**: 5–116, 9 pls.

POWELL AWB 1966 The molluscan families Speightiidae and Turridae. An evaluation of the valid taxa, both Recent and fossil, with lists of characteristic species. *Bulletin of the Aukland Institute and Museum* **5**: 1–184, 23 pls.

ROLÁN E, RYALL P & HORRO J 2008 Notes on West African *Perrona* (Gastropoda: Clavatulidae), with the description of a new species. *Iberus* **26**: 5–16.

SCARPONI D & DELLA BELLA G 2003 Conoidea Vol. 1 – Drillidae e Turridae. *In:* CEREGATO A & RAFFI S (eds) *Molluschi marini del Plio-Pleistocene dell'Emilia-Romagna e della Toscana* **1**: 1–93.

SCARPONI D & DELLA BELLA G 2007 Conoidea Vol. 2 – Conidae I (Sottofamiglie Clathurellinae, Conorbinae & Taraninae). *In:* CEREGATO A & RAFFI S (eds) *Molluschi marini del Plio-Pleistocene dell'Emilia-Romagna e della Toscana* **2**: 1–93.

TUCKER JK 2004 Catalog of Recent and fossil turrids (Mollusca: Gastropoda). *Zootaxa* **682**: 1–1295.

VERA-PELÁEZ JL & LOZANO-FRANCISCO MC 2001a Revisión de la subfamilia Clavatulinae (Gastropoda, Prosobranchia, Turridae) con ocho especies nuevas del Plioceno andaluz (S. España). *Pliocenica, Publicaciones del Museo Municipal Paleontológico de Estepona* **1**: 1–67.

VERA-PELÁEZ JL & LOZANO-FRANCISCO MC 2001b Paleobiogeografía y paleoecología de la subfamilia Clavatulinae (Turridae, Gastropoda) en el Plioceno del Mediterráneo occidental y región Lusitánica. *Jornadas de la Sociedad Española de Paleontología* **17**: 189–195.