

Late Famennian ?*Chaetosalpinx* in *Yavorskia* (Tabulata): the youngest record of tabulate endobionts

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ABSTRACT:

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Tabulate corals are sometimes associated with other organisms occurring within their skeletons. These tabulate endobionts are common in Lower Palaeozoic (Ordovician and Silurian) and Devonian strata, but until now they have not been recognized in strata younger than early Frasnian. Here we report ?*Chaetosalpinx* sp. occurring within the skeletons of the tabulate coral *Yavorskia* sp. (Favositida, Cleistoporidae) from the latest Famennian ("Strunian") in the Etreoungt area (Northern France). It can be stated that these endobionts survived the Frasnian–Famennian boundary crisis and recovered in the Late Famennian.

Key words: Parasitism, Commensalism, Strunian, Famennian, Tabulata, *Chaetosalpinx*, Ardennes.

INTRODUCTION

Endobionts of tabulate corals have been known since the classic papers of GOLDFUSS (1829) describing a worm (later called *Hicetes* by CLARKE 1908) occurring within a tabulate coral *Pleurodictyum*. Later authors described several other genera, such as *Chaetosalpinx* and *Helicosalpinx* (for a review see TAPANILA 2005 and ZAPALSKI 2007). These organisms were sometimes considered as serpulids (e.g., HOWELL 1962), but usually treated as *incertae sedis* (e.g., OEKENTORP 1969, HILL 1981), or classified under ichnofauna (e.g., TAPANILA 2005). The interaction between them and the host corals was most often interpreted as commensalism (e.g., OEKENTORP 1969; PLUSQUELLEC 1968a, b; TAPANILA 2004), but at least in the case of *Chaetosalpinx* parasitism seems to be more probable (ZAPALSKI 2004, 2007). These endobionts are well known from various taxa of host tabulate corals, and for a

long time they have been found only in strata older than the Givetian–Frasnian boundary (TAPANILA 2005). Here we report the youngest known, late Famennian ("Strunian") ?*Chaetosalpinx* inhabiting coralla of the favositid *Yavorskia* (the genus *Chaetosalpinx* itself has been also found in Frasnian stromatoporoids, see TAPANILA 2006). This discovery corrects the upper stratigraphic range of the genus *Chaetosalpinx* and all tabulate endobionts by at least 20 Ma.

MATERIAL AND METHODS

Our material (Text-fig. 1) consists of three coralla of a very rare tabulate coral belonging to the genus *Yavorskia* FOMICHEV, 1931 (Favositida, Cleistoporidae), infested by endobionts. This genus is characterized by a wall with numerous mural pores, a spongy structure in the peripheral part of the intracalicular filling and

very large corallites, up to several millimetres in diameter (HILL 1981; LAFUSTE & PLUSQUELLEC 1985). The material comes from two sites, the Du Parcq and Dubar quarries in the vicinity of Etroeungt, Avesnois (westernmost Ardennes), Northern France. The former is the classic site from where Strunian facies (Etroeungt limestone) were first described (GOSSELET 1857, 1860), the latter exposed coeval strata but is now buried. *Yavorskia* is a tabulate coral characteristic of the “Strunian” of the Ardennes (HUBERT & *al.* 2007; ZAPALSKI & *al.* 2007). The specimens come from old collections of the Université Catholique de Lille (UCL). These collections contain several more specimens of *Yavorskia* (*Yavorskia compressa*, with smaller corallites) from these two sites, but they do not contain any endobionts.

Three coralla provided seven large thin sections

(80×60 mm); two out of three specimens were ground and acetate peels (transverse to the axes of corallite growth) were prepared – grinding provided 36 acetate peels (at intervals of 0.20–1.0 mm). Fifteen ultra-thin sections were also prepared in order to observe the skeletal microstructure.

The material is housed at the Faculté libre des Sciences et Technologies, Lille, under the repository abbreviation GFCL.

SYSTEMATIC PALAEOONTOLOGY

The endobionts belonging to the genus *Chaetosalpinx* were classified by TAPANILA (2005) as trace fossils but, following BERTLING & *al.* (2006), we regard them as body fossils.

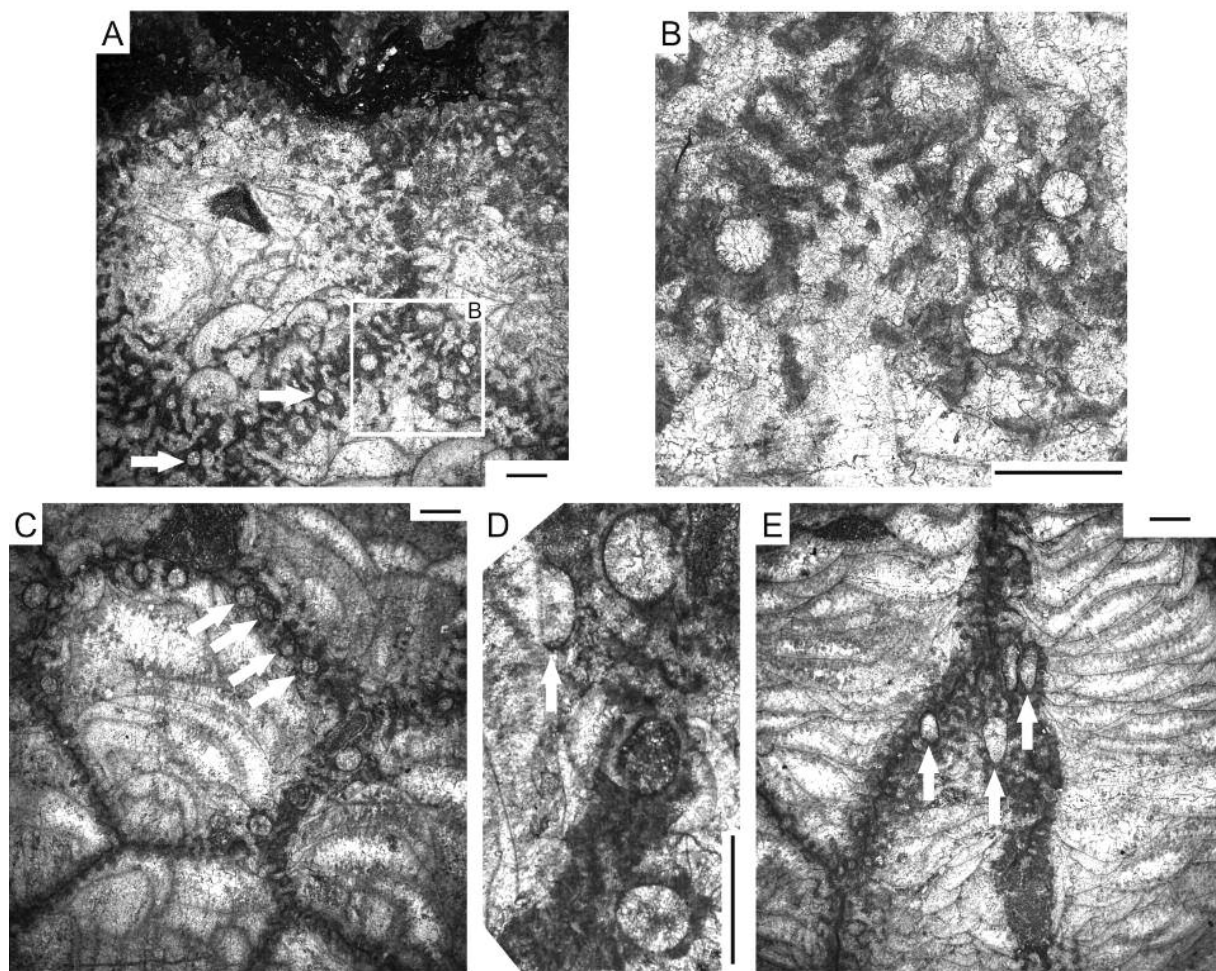


Fig. 1. ?*Chaetosalpinx* sp. infesting *Yavorskia* sp. A, B – cross section through specimen GFCL AV T.245.S7, Dubar Quarry, Avesnois, France; Etroeungt limestone, Late Famennian. C, D – cross section through specimen GFCL AV EP 188.1, Du Parcq Quarry, Avesnois, France; Etroeungt limestone, Late Famennian. E – same specimen, longitudinal to oblique section. Arrows mark ?*Chaetosalpinx* sp.; note the incomplete cavity in Fig. 1D (marked by arrow). Scale bars equal 1 mm

Family unknown

Chaetosalpinx SOKOLOV, 1948.

TYPE SPECIES: *Chaetosalpinx ferganensis* SOKOLOV, 1948; Fergana, Uzbekistan; Silurian.

DIAGNOSIS: Vertical tubular embedment cavity, circular to oval in cross-section, with margins of tube defined by host skeletal material. Linings and tabulae are absent. (STEL 1976, see also TAPANILA 2002, p. 17)

?*Chaetosalpinx* sp.
(Text-fig. 1)

MATERIAL: Three coralla of *Yavorskia* sp., containing numerous tubes of ?*Chaetosalpinx* sp., specimens GFCL AV EP 188.1, GFCL AV T.245.S7, GFCL AV T.245.D3.

DESCRIPTION: Tubular cavities located within the walls of the host coral and in the spongy structure close to the wall (Text-fig. 1B, 1C), without any recognizable preference in position. They are vertically placed, more or less parallel to the axes of the host corallites. Their lumen is round, oval or slightly irregular in cross section, devoid of a wall. The mean maximum diameter of their lumen in cross section is 0.41 mm ± 0.11 mm (N=111), and varies from 0.15 to 0.68 mm, without any recognizable vertical change. The cavities meander slightly longitudinally. Some of the “tubes” are incomplete in cross section, as shown in Text-fig. 1D. The microstructure of the skeletal material around the lumen has the same features (morphology of crystals, size) as the skeleton of the host coral. Internal structures probably absent.

REMARKS: The simple morphology and absence of a proper wall allow our material to be tentatively assigned to the genus *Chaetosalpinx*. Irregularities in the vertical orientation of the “tubes” meant that it was impossible to obtain strictly longitudinal sections; the presence of internal structures therefore remains unknown and hence the generic attribution cannot be certain.

The specimens studied seem to be most similar to *Chaetosalpinx sibiriensis* (SOKOLOV, 1948) from the Silurian of Siberia. The general shape, relation of the endobiont to the skeleton of the host and range of diameters are the most similar characters. Due to the large stratigraphic gap between *Ch. sibiriensis* and the Devonian ?*Ch.* sp. described here the material is reported under open nomenclature.

ECOLOGY

The relation between the host and the endobiont is somewhat unclear. The position of the ?*Chaetosalpinx* between the walls indicates that it had to perforate soft tissue of the host. Moreover, “open” tubes (as shown in Text-fig. 1D) may indicate a contact of the endobiont and the soft tissue of the host. Perforation of the soft tissue is also possible, as placement between the ectoderm and skeleton would probably cause skeletal “embedment” of the infesting individual (see PLUSQUELLEC 1968b). The interaction between the coral and ?*Chaetosalpinx* might therefore be interpreted as parasitism, albeit the material available does not enable the problem to be resolved definitively. On the other hand, the influence of the endobiont is not visible on the host’s skeleton morphology, at least not so clearly as on material described so far by other authors (e.g., OEKENTORP 1969, ZAPALSKI 2007).

CONCLUSION

Yavorskia is a new taxon of tabulate corals hosting ?*Chaetosalpinx* endobionts. The discovery of ?*Chaetosalpinx* in the Late Famennian shows that these organisms (tabulate endobionts) survived the Frasnian–Famennian boundary crisis and recovered in the Late Famennian.

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