



A revision of the genera *Galeolaria* and *Pyrgopolon* (Polychaeta: Serpulidae), with discussions on opercular insertion as a character in their taxonomy and relationships, and their zoogeography

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Abstract

While earlier works have shown that the operculum is inserted in the position of the first or second branchial radiole in serpulimorph taxa, the present paper shows that it is inserted independently of the branchial radioles of both sides in the genera *Galeolaria* and *Pyrgopolon*. Although both genera possess several characters in common with the group consisting of *Pomatoleios*, *Pomatoceros* and *Spirobranchus*, a cladistic analysis revealed that they form two distinct clades, as sister groups to each other. Extant species of *Pyrgopolon* occur mainly in the Caribbean region, and of *Galeolaria* in eastern Australia and New Zealand. However, there is palaeontological evidence indicating that fossil species of *Pyrgopolon* had a wider geographical distribution, having existed in Europe during geological times.

Key words: Opercular insertion, taxonomy, zoogeography

Introduction

According to work by Orrhage (1980) and others on the derivation of the operculum and lip-associated structures in Sabellida, and as reviewed by Pillai (2008), it is inserted in the position of the second branchial radiole of the left side in *Pomatoleios*, *Pomatoceros* and *Spirobranchus*, the second radiole of the left or right side in the Serpulinae, *sensu stricto*, and the first radiole of the left side in the Ficopomatinae.

However, in the descriptions which follow it is shown that opercular insertion is independent of the branchial radioles of either side, indeed right from the middle of the anterior end of the thorax in the genera *Galeolaria* Savigny, 1818, and *Pyrgopolon* de Montfort, 1808, there also being no trace in them of a reduced branchial radiole on either side to indicate that the operculum had been derived from a branchial radiole of the opposite side.

It emphasizes the view expressed by Orrhage (1980) that increased knowledge on the “homologues of the anterior end of the polychaete families Sabellidae and Serpulidae” besides the anatomy of polychaetes in general”, “is a prerequisite for further consideration of the phylogeny of the Polychaeta.”

Genus: *Galeolaria* Savigny, 1818

Type species: *Galeolaria caespitosa* Lamarck, 1818.

For authorship see also Hartman (1959), Dew (1959) and Hutchings (1982).

Diagnostic characters: Operculum calcareous; inserted independently of branchial radioles of both sides, i.e., mid-dorsally, at anterior end of thorax, and consists of following calcareous structures: a mosaic of basal plates, surmounted by a central cluster of movable spines, and surrounded by a marginal palisade of short rod-