

New observations on *Loxosomella tonsoria*, with notes on distribution and host specificity of the genus

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Loxosomella tonsoria (Entoprocta: Loxosomatidae) was found associated with the polynoid polychaete *Lepidonotus clava* collected among the algae and debris scraped from the intertidal level at the rocky shore of Limens (Pontevedra, Spain). New features are added to the original description, together with the first description of its buds. Host specificity of the genus and distribution of this species are discussed.

Loxosomatids are typically commensals or parasites, most being associated with animals that produce water currents from which they can filter food particles (Nielsen, 1964). Marked host specificity has been considered to be characteristic of most of the epizoic Loxosomatids (Nielsen, 1964, 1966, 1989) and hosts have often been used as taxonomic and distributional characters (Nielsen, 1964). Other authors deny such specificity (Emschermann, 1993).

Loxosomella tonsoria Emschermann, was found attached to the polynoid polychaete *Lepidonotus clava* (Montagu), in the Galician coast. This species was originally described associated to the ampharetid polychaete *Glyphanostomum* sp. living at a depth of 320 m in Antarctic waters. New details are added to the original description of *Loxosomella tonsoria*, including a first description of its buds. This is the first report of the genus *Loxosomella* for the Iberian Peninsula and of *L. tonsoria* for the northern hemisphere.

Samples were collected during low tide, at the *Fucus* belt level in 1996. Each sample was scraped from a square area of 400 cm² with a paint scraper. Polychaetes appeared among the algae and debris obtained. Fifteen polychaetes were inspected, eight of which bore specimens of *L. tonsoria*.

Polychaetes were narcotized with MgCl₂ and fixed in 10% formalin. The entoprocts used for light microscopy were transferred to a glycerin solution in alcohol left to evaporate to glycerin. Each specimen was individually mounted in cobb-aluminium slide frames with modified Hoyer's medium (50% less chloral hydrate). Material for scanning electron microscope (SEM) was dehydrated in an alcohol series, critical point dried and sputter coated with gold. Photographs were taken with a JEOL SEM 6400 and with a ZEISS II photomicroscope. Free-hand sketches were made of fixed and mounted specimens. The host polychaete, *Lepidonotus clava*, was identified following Fauvel (1923).

Loxosomella tonsoria specimens found in Galicia are small, with a total average length of 348 ± 80.87 μm (range: 231–544 μm) whereas the Antarctic specimens are considerably larger, but with the same body proportions. This variation in size depends on ecological conditions and is not sufficient for creating new species (Franzén, 1973; Nielsen, 1989; Emschermann, 1993).

The lophophore points upwards, and has eight (occasionally nine) tentacles in both large and small specimens, the bases of which are united by a collar-like tentacular membrane. It is oriented distally in both relaxed (Figure 1A), and contracted

specimens but becomes oblique in those with various embryos in the atrium. A muscle strand is observed within the tentacular membrane, these muscles forming a sphincter that contracts the membrane (Figures 1B & 2C). The tentacles are relatively long and slender, reaching a length of around 60 μm. The calyx is somewhat laterally compressed, and always longer than wide (length/width ratio: 1.63 ± 0.39). Width (mean: 119 ± 22.38 μm) and depth (mean: 172 ± 60.76 μm) are almost the same in small specimens, but in those carrying embryos, the atrial cavity expands posteriorly, and its depth becomes almost twice its width. With this expansion, the gut is pushed backwards and projects out sharply as a sort of keel (Figure 2A). Seen both frontally and from the abfrontal side, the body has a characteristic lyrifform shape (Figure 2A,B).

The calyx is sharply demarcated from the long cylindrical stalk in which conspicuous but few longitudinal muscles can be observed, clearly connecting both peduncle and calyx.

In the lower part of the peduncle the vestigial pedal gland is distinctly visible (Figure 2B,C). The longitudinal muscles are fixed to the foot epithelium all around the pedal gland. The peduncle is longer (mean 150 ± 38.45 μm) than the calyx (mean 199 ± 63.94 μm) in small specimens but shorter than the latter in the adults. In many *Loxosomella* species the length of the peduncle varies greatly within a population, and its length relative to the calyx is generally a function of the specimens' size, and therefore its age (Bobin & Prenant, 1954). A very thick (about 3.3 μm) and conspicuous cuticle covers the specimens (both adults and buds) (Figure 1B,C).

Despite careful and systematic revision of the specimens under the SEM, no sensory papillae or any other external sensory organs have been observed, neither in adult specimens nor in buds.

The stomach occupies almost the whole of the calyx and has an ovoid or almost spherical outline, without lateral lobes (Figures 1B & 2A–C). Groups of yellowish granular cells are observed all around the stomach, but are especially abundant on the basal region (Figure 2C).

The stomach is higher (mean 108 ± 34.22 μm) than wide (mean 94 ± 27.74 μm) and deep (149 ± 45.86 μm) in relaxed specimens, but much deeper when the atrial cavity is expanded.

Gonads, when developed, are located just above the lateral parts of the stomach (Figure 2A), though they may be pushed downwards with the expansion of the atrial cavity by the

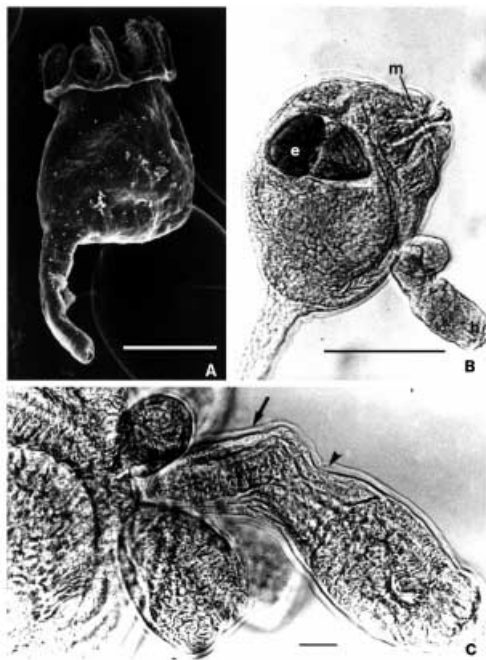


Figure 1. (A) Scanning electron micrograph of *Loxosomella tonsoria*. Left view of a large specimen with expanded atrial cavity. (B) Right view of a contracted specimen showing simultaneous budding and eggs in the atrial cavity. (C) Five buds of *Loxosomella tonsoria*, one of them prior to detaching. Note the long foot and developed stalk (arrow and arrow head, respectively). b, bud; e, egg; m, muscle strands. Scale bars: A, B, 100 μ m; C, 10 μ m.

developing embryos. Up to five embryos and buds have been observed in specimens from all the infected polychaetes at the sampling time. The ripe ovum is about 85 μ m in diameter.

Buds develop from a pair of anterolateral areas, level with the upper part of the stomach (Figures 1B & 2B,C). New buds are developed alternately on opposite sides and attach to the parent by the 'toe' of the peduncle, migrating medially as they grow and new ones originate on top. Large buds have a differentiated foot with a groove and accessory gland cells and a foot gland which lies along the underside of the stomach. The body is relatively long and slender and there is a clearly demarcated though not long, stalk region between body and foot (Figure 1C). They attain a length of about 100 μ m before detaching from the parent.

Buds appear in specimens which have not yet reached adult size and at the same time as eggs are being brooded (Figure 1B). Budding may be influenced by physiological conditions, such as the degree of nutrition, but does not appear to be strongly influenced by size, sex or age (Bobin & Prenant, 1954; Mariscal, 1975).

In Galicia, *L. tonsoria* was found throughout the surface of *Lepidonotus clava* in multi-aged groups. Most of the specimens appeared dorsally between the podia and on the under-surface of the elytra (Figure 4D). More than 200 specimens have been found on one single polychaete. They were well fixed to the substratum and sometimes difficult to detach.

Loxosomella tonsoria has been found in quite different hosts. This suggests that although loxosomatids are generally confined to one host or to certain host types within a limited area of distribution (Nielsen, 1964; Emschermann, 1993), they may be able to develop easily on other hosts whenever a suitable shelter and feeding currents are provided.

The fact that *L. tonsoria* has appeared both in the coast of Galicia (mid-Atlantic) and in Antarctic waters suggests that this species is at least circum-Atlantic in its distribution, more

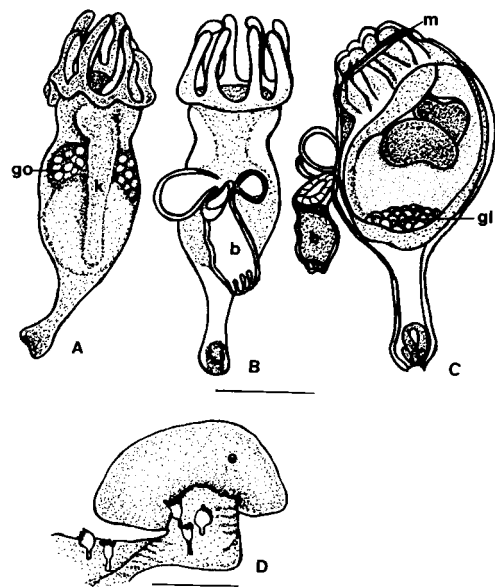


Figure 2. Diagrammatic views of *Loxosomella tonsoria*. (A-C), abfrontal, frontal and left side views respectively. (D) Location of the entoprocts under the elytra's surface. The entoprocts have been proportionally enlarged for clarity of the representation. b, bud; e, elytre; gl, glands; go, gonads; k, keel; m, muscle strands. Scale bar: A-C, 100 μ m; D, 1 mm.

specific surveys along intermediate waters being necessary to confirm it.

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