A morphological and ultrastructural study was performed on the gills of *Palaemonetes argentinus* from the Sotelo stream, a tributary of the Mar Chiquita coastal lagoon (Argentina, 37°45′S 57°26′W). This species possesses a phyllobranchiate gill, in which the central axis is triangular and has one row of flattened lamellae on each side. There are one afferent channel, two efferent channels, and several tegumental glands along the axis. Nephrocytes are only present in the stem, associated with the efferent haemolymph. Mature nephrocytes have a voluminous vacuole, surrounded by satellite vacuoles, a lateral nucleus, and pedicels on the surface. In the lamellae, the principal cells have apical extensions with deep infoldings and a neck-like zone with bundles of microtubules. The nucleus is in a basal expansion of the cell and the basolateral membranes of neighbouring cells are interdigitated, with large numbers of mitochondria in the interdigitations. The cells show characteristics of both respiratory and ion-regulatory epithelium; they also have a structural role in directing the haemolymph flow and in supporting the lamellae. The thicker cuticle near the marginal channel increases mechanical support. The ultrastructure of the lamellar epithelium appears to be related to the capability of *P. argentinus* of living in freshwater and adapting to media with variable salinity.
proporcionan sostén a las laminillas. La cutícula engrosada en el canal marginal incrementa el sostén mecánico. La ultraestructura del epitelio de las laminillas parece estar relacionada con la capacidad de *P. argentinus* de vivir el agua dulce y de adaptarse a ambientes con salinidad variable.

INTRODUCTION

The crustacean gill is a complex organ that serves in ion regulation, respiration, and excretion (Johnson, 1980). Gills were also identified as the second organ after the hepatopancreas, able to accumulate metals after exposure to high concentration (Rainbow, 1995; Laporte et al., 1996; Soegianto et al., 1999). They are involved in removing foreign particles (Martin et al., 2000), and in penaeid shrimp they are the major site of removal of foreign materials, because shrimps lack fixed phagocytes in haemal spaces of the digestive gland (Martin et al., 1993).

In spite of the many studies done for more than a century, the main features of the functional morphology of the decapod gills have just emerged, and ultrastructural and vascular casting studies produced useful information on gill structure and function (Taylor & Taylor, 1992).

*Palaemonetes argentinus* Nobili, 1901 is one of the most widely distributed decapods in the littoral region of Argentina, Paraguay, Uruguay, and southern Brazil (Boschi, 1981; Morrone & Lopreto, 1995). This prawn plays an important role in the trophic network of the environments it inhabits (Spivak, 1997; Collins, 1999). It is considered a typical freshwater species; however, it has also been found in brackish coastal lagoons along the coast of the southwestern Atlantic Ocean (Anger et al., 1994). In these lagoons, salinity can be low (1 to 5‰) for extended periods of several days, or it can vary between 1 and 30‰ within a few hours (Charmantier & Anger, 1999).

*P. argentinus* also inhabits areas that receive direct discharges of chemicals from terrestrial ecosystems, and thus accumulates important amounts of organochlorine pesticides in its tissues (Gonzalez Sagrario et al., 1998). Gills are the first organs impacted by the presence of pollutants in the water (Lawson et al., 1995).

*P. argentinus* has phyllobranchiate gills as do other caridean prawns. There is a great body of information about this gill type in various brachyurans, such as species of the genera *Carcinus* Latreille, 1796 (cf. Drach, 1930; Taylor & Taylor, 1986; Taylor, 1990), *Callinectes* Stimpson, 1860 (cf. Johnson, 1980), *Grapsus* Lamarck, 1801 (cf. Taylor & Taylor, 1992), *Potamon* Savigny, 1816 (cf. Maina, 1990), and *Ocypode* Weber, 1795 (cf. Farrelly & Greenaway, 1994). However, there are only a few anatomical investigations on phyllobranchiate gills in non-brachyuran decapods, for example, the anomuran *Galathea* Fabricius, 1793 (cf. Pike, 1947), and the caridean prawns, *Palaemonetes varians* (Leach, 1814) (Taylor & Taylor, 1992), *Palaemonetes pugio* Holthuis, 1949 (cf. Doughtie &