Parental care is defined as any form of behaviour by parents to increase the chances of offspring survival (Vaz-Ferreira and Gehrau, 1971; Clutton-Brock, 1991; Alcock, 1993; Santos and Amorim, 2006; Cheng and Kam, 2010), causing a cost to the parents that can interfere with their ability to invest in future offspring (Trivers, 1972).

At least 7% of frog species have some form of parental care (Wells, 1981), however, the most common examples are those associated to spawning, larvae care, carrying of eggs and larvae and providing larval food (Crump, 1995). The parental behaviour may also be related to defending against predators, and in anurans, it can be executed by one parent or both (Beck, 1998; Santos and Amorim, 2006).

Among anurans, the Leptodactylidae family is known for performing some types of parental care (Heyer, 1994), such as in, Leptodactylus pentadactylus group (Heyer, 1969), Leptodactylus latrans group (Vaz-Ferreira and Gehrau, 1975), Leptodactylus fuscus group (Giaretta and Oliveira Filho, 2006) and Leptodactylus melanotus group (Sá, Brandão and Guimarães, 2007).

For L. melanotus group and L. latrans group gregarious tadpoles can occur, forming high-density aggregates until the completion of metamorphosis (Downie, 1996). This clustering behaviour in tadpoles may have been the determinant for the appearance of parental care (Vaz-Ferreira and Gehrau, 1975). Some species with gregarious tadpoles may show etepimeletic behaviour (casual physical contact between the larvae and the caregiver) (Santos and Amorim, 2006).

In this work, we report two observations of parental care for Leptodactylus pustulatus (Peters, 1870) and Leptodactylus macrosternum Miranda-Ribeiro, 1926, belonging, respectively, to the groups melanotus and latrans, recorded in two different north-eastern areas of Brazil.

Leptodactylus pustulatus can be found in areas with vegetation types typical of the Cerrado and Caatinga (AmphibiaWeb, 2012), and forested and coastal areas of Ceará state, Brazil (Borges-Nojosa, 2007; Borges-Leite, 2008). On June 18, 2011 in São Gonçalo do Amarante municipality, Ceará state (S 03°30’41,2”, W 38°55’07,9”), we verified the occurrence of parental care, when a female (CHUFC A5987) located on the edge of a small body of water, about 4 m away from a larger pool, and 50 m from another pond where groups of males of this species were vocalizing in “pots” (cluster of vegetation forming a pit). We could approach to within 20 cm the female, and she did not show any reaction, even allowing herself to be touched. During the observation, we observed an aggregation of hundreds of tadpoles which remained approximately 3 cm from the female (Fig. 1A). This observation supports the view of Sá, Brandão and Guimarães (2007), that L. pustulatus is a species with parental care.

Leptodactylus macrosternum is widely distributed through Ceará state (Borges-Nojosa et al, 2010). This species is considered by some authors as a synonym of L. chaquensis Cei, 1950 (De La Riva and Maldonado, 1999), which is distinguished mainly by its distribution, and is restricted to northern and north-eastern South America, where it occurs even in anthropogenic habitats (AmphibiaWeb, 2012). In the group L. latrans, to which...
this species belongs, parental care is known for *L. ocellatus* (Vaz-Ferreira and Gehrau, 1975), *L. chaquensis* (Prado, Uetanabaro and Lopes, 2000) and *L. bolivianus* (Wells and Bard, 1988). However, there are no references to such behaviour in observations of *L. macrosternum*. On March 23 2011, in Itapipoca municipality, Ceará state (S 3°25’03.75”, W 39°41’31.57”), we observed parental care in *L. macrosternum*. During this event, a female was seen at the edge of a pond, among the aquatic vegetation, leading a group of approximately 800 tadpoles. The female performed pumping activities using her hind legs, attempting to lead the tadpoles to areas of greater depth in the pond. This activity was intensified with the approach of observers (Fig. 1B). According to Santos and Amorim (2006), pumping is one of the main types of behaviour when offering assistance to offspring, which has been recorded for other species of leptodactylid, including *L. latrans* group, and may be related to a communication between the parent and the tadpoles (Hoffman, 2006). During the same event, we also observed etepimeletic behaviour among the tadpoles, which sporadically maintained physical contact with the female. Etepimeletic behaviour is common in tadpoles and may also be related to a form of communication between the female and tadpoles (Gallardo, 1964; Santos and Amorim, 2006;
Parental care in two species of *Leptodactylus*

Hoffman, 2006). From what we observed, we believe that *L. macrosternum*, like other members of the *latrans* species complex, shows parental care, in addition to the gregarious and etepimeletic behaviour of tadpoles.

This study presents two new records of parental care, which is unprecedented in the literature for the species *L. macrosternum*, and another reinforcing that already proposed by Sa et al. (2007) for *L. pustulatus*.

**References**


