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Comunicação Científica

Anomalies in *Achatina fulica* collected in the municipality of Valença, Rio de Janeiro State, Brazil

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Abstract. This is the first report on the occurrence of anomalies found in *Achatina fulica* in the municipality of Valença, Rio de Janeiro State, Brazil. 200 specimens were collected, quantified for the presence of anomalies, measured and photographed. The animals showed anomalies in the cephalopodal mass, labial palps and tentacles. An anomalous shell was also found in this region. The causes of the deformities were not identified. To better understand them, additional studies on the on-site animal ecology, pathological analyses of the altered structures and molecular investigation are needed.

Keywords: Terrestrial mollusks, deformities, cephalopodal mass, labial palps, tentacles.

Resumo. Relatou-se a primeira ocorrência de anomalias encontradas em *Achatina fulica* no Município de Valença, Rio de Janeiro, Brasil. Foram coletados 200 espécimes, que foram quantificados para presença de anomalias, medidos e fotografados. Os animais apresentaram anomalias na massa cefalopodal, palpos labiais e tentáculos. Também foi encontrada uma concha anômala no local. Não foram identificadas as causas das deformações. Para melhor esclarecimento são necessários estudos adicionais sobre a ecologia do animal no local, análise patológica das estruturas alteradas e uma investigação molecular.

Palavras-chave: Moluscos terrestres, deformidades, massa cefalopodal, palpos labiais, tentáculos.

Land snails have been used as bioindicators, for they accumulate chemicals from industrial, domestic and agricultural waste, such as heavy metals, which can cause deformities in these animals (Mule & Lomte, 1994; Regoli *et al*., 2006). The response to these contaminants can occur both at the organism and cellular levels (Regoli *et al*., 2006). Pathogens such as fungi, parasite, bacteria, protozoa, viruses or even a predator attack may also have a role in these deformities (Mead, 1956).

The aim of this work was to observe, quantify and describe the anomalies found in the specimens of *Achatina fulica* collected in the municipality of Valença, Rio de Janeiro State.

Two hundred specimens at different stages of development were collected during themonth of June 2010 in the neighborhood of Varginha, an urban area of the municipality of Valença, Rio de Janeiro State, Brazil (22^0 26′ 45.62″S; 44^0 13′ 9.25″W). The samples were collected in household surroun-

dings along a stream where the release of waste and domestic and industrial sewage was reported. The individuals collected were taken to the laboratory for identification of anomalies.

The snails were analyzed, quantified for the presence of anomalies and photographed. The length of both the shells and the anomalous structures were measured with a caliper (0.05mm precision). After being killed, the aniamals were fixed in 70% alcohol for further analyses and deposited in the collection of the Malacologia Professor Maury Pinto de Oliveira Museum (record no. MM8421).

Among the snails collected, 16% presented anatomical anomalies, of which 1.6% was observed in the cephalopodal mass, 3.2% in the labial palps and 11.2% in the tentacles. An anomalous 9 cm long shell was also collected at the place, and its anomaly was characterized as a shift in the growth pattern which also caused a deformation in its opening (Figures 2A and 2B). In Figure 1 we can observe in sample *A. fulica* without anomalies.

Figure 1: *Achatina fulica* without anomalies from the munipality of Valença, Rio de Janeiro.

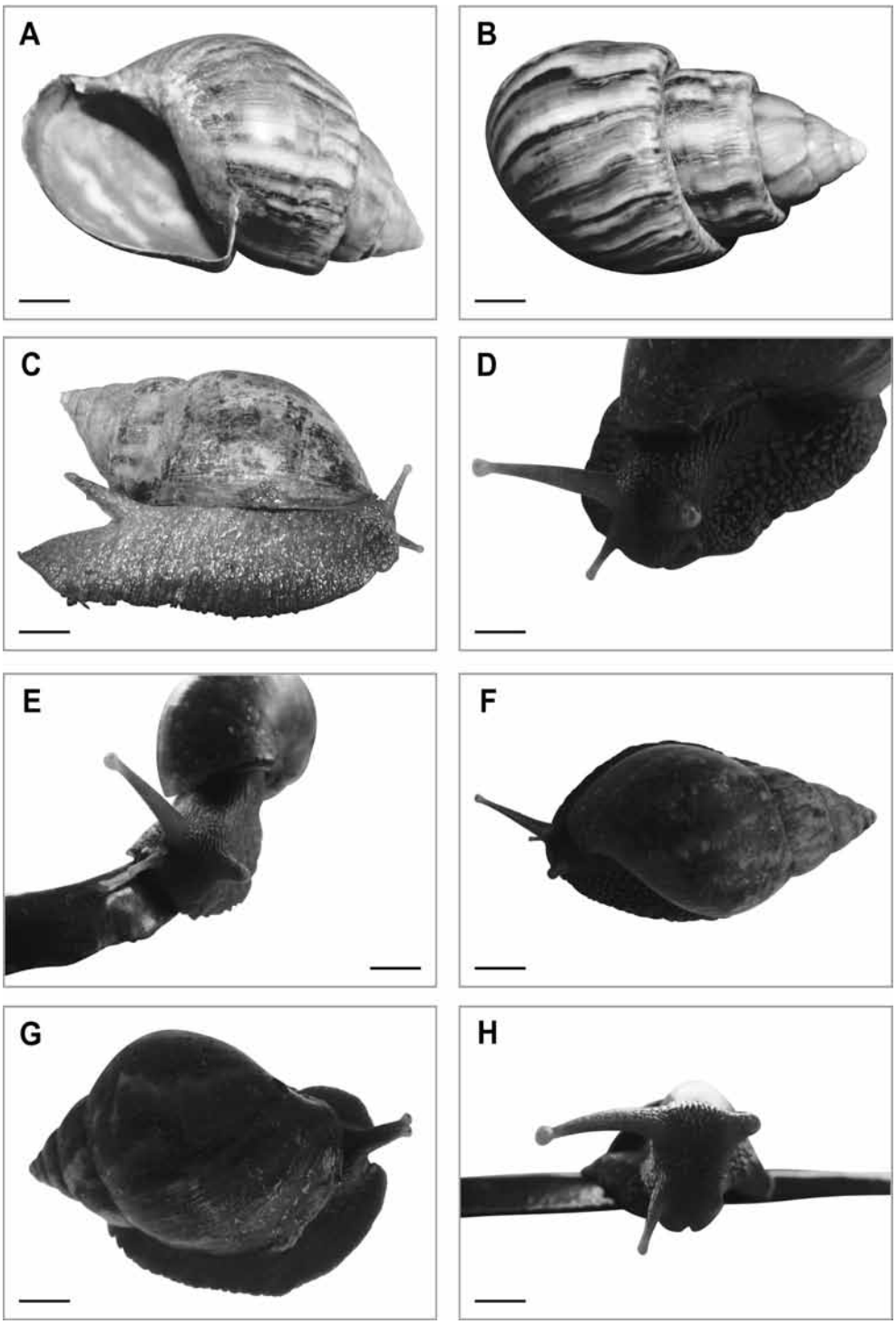

Figure 2: A and B- *A. fulica* with an anomalous shell; C- *A. fulica* with a vertical structure in the cephalopodal mass; D, E and F- *A. fulica* presenting different sized tentacles; G- *A. fulica* presenting a junction of the tentacles followed by a short ramification; H- *A. fulica* showing the absence of one labial palp. ——— = 15 mm.

One of the specimens collected (9.7 cm shell length) presented a contractile and sensitive to stimuli vertical structure resembling a 1.8 cm long tentacle, situated in the hind portion of the cephalopodal mass (Figure 2C).

Among the anomalies observed in the tentacles were the absence of a single one or both, a size difference between them, a junction followed by a short ramification ending in the ocelli (Figures 2D, 2E, 2F and 2G) and the absence of one of the ocelli (9.2cm; 8.8cm; 7.9cm; 9.1cm and 2.7cm shell length respectively). The anomalies the tentacules were observed for young and adults animals. Unlike anomalies in shell and mass cefalopedial only reported for adults.

Anomalies in the opening of the shell in *A. fulica* have already been observed by Fields *et al.* (2006) in St. George, Barbados. According to these authors, such anomalies are likely to be transmitted hereditarily, since they have also been found both in newly-hatched and in juvenile individuals from the populations they analyzed.

Mead (1956) observed in Ceylon, USA, a specimen of *A. fulica* with a distorted and shortened tentacle due to a pathological tissue alteration, whereas the other tentacle presented small tissue elevations**.** The causative agent of the anomaly was not identified.

With regard to the labial palps, it was observed that either one palp or the whole structure was missing (9.5 and 8.7cm shell length, respectively) (Figure 1H). Anomalies in the labial palps have already been observed by Cardoso *et al.* (2001) and Almeida (2010) in *Pomacea lineate* (Spix, 1827), who reported a bifurcation in this structure.

Other studies with *Biomphalaria glabrata* embryos exposed to differents cheminals demonstrated that the damage caused by drugs depended on the embrio in that these mollusks were at the time of treatment. Chefalic malformations involving the number and position of an eye and tentacles have also been observed in embryos of *B. glabrata* treated with caffeine and water extract of *L. nobilis,* in the early stages of development (first divides the blástula), suggesting that changes in the region of the head plate (future region of the eye and tentacles), since this region is not yet formed during these stages (Camey *et al*., 1960; Simões & Kawano, 1982; Rê & Kawano,1987).

The causes of the deformities found have not been identified. For a better understanding of these facts, studies on the on-site animal ecology, pathological analyses of the altered structures as well as molecular investigation are necessary.

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