

CARDIOVASCULAR REACTIVITY AS AN INDICATOR OF LEARNING IN THE AMPHIBIAN *Rhinella arenarum*

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Terrestrial toad,
Rhinella arenarum,
Ancestral vertebrate
model.

2 - Subjects were chronically implanted with electrodes and exposed to the presentation of NaCl solutions in an inescapable compartment, while the heart rate was recorded on a PC with a polygraph. Amphibians were trained once a day for 12 sessions. First 6 sessions of Acquisition and then 6 more Extinction sessions. During the acquisition, a 300 mM NaCl saline solution (neutral) was presented, followed by an 800 mM NaCl solution (aversive) which generated a large increase in heart rate.

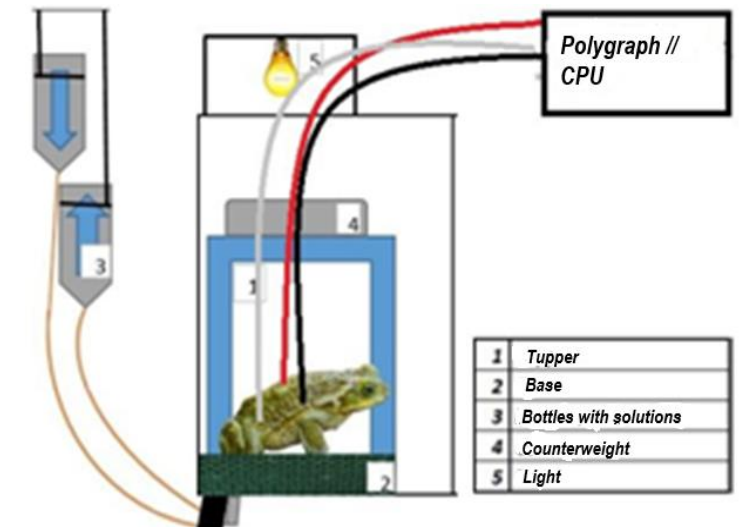
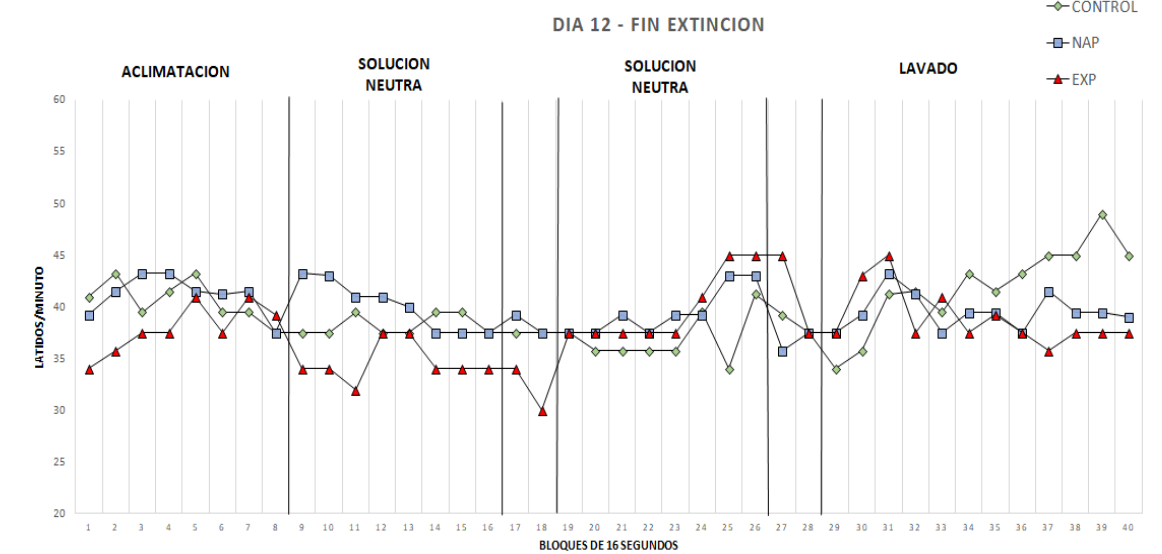
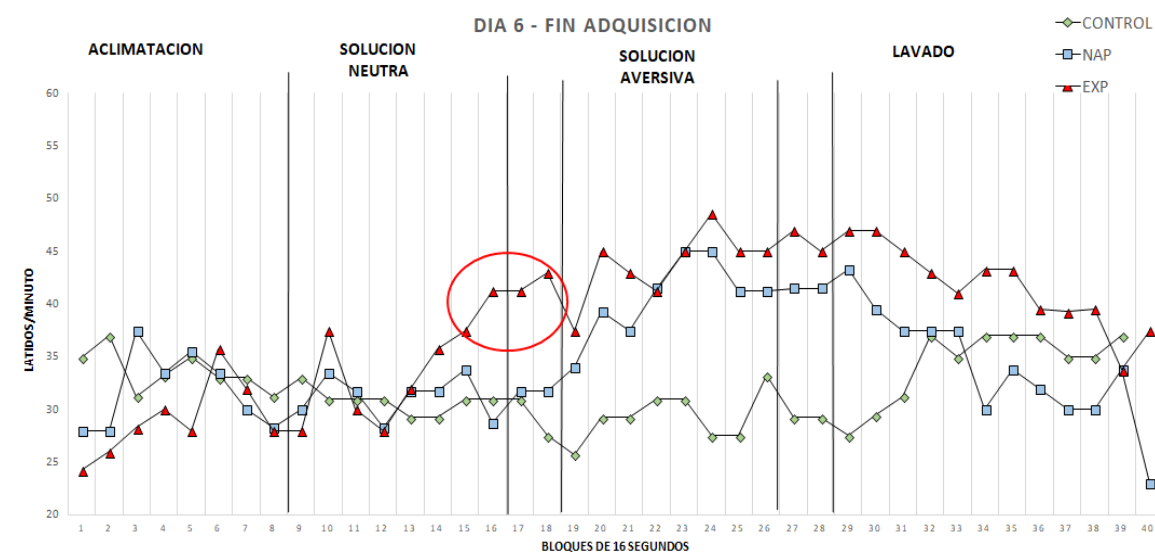
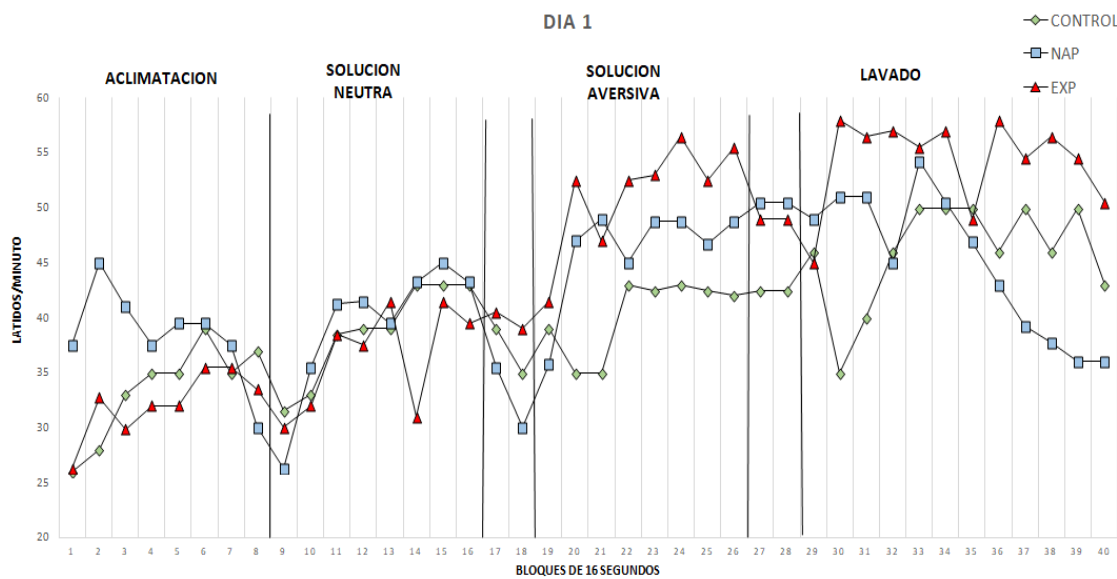


Diagram of the experimental device.

1 - The adaptation of vertebrates to new environments involves cardiorespiratory adjustments, especially when faced with an aversive one. In order to analyze the control mechanisms underlying this phenomenon, we have developed a procedure for aversive stimulation and chronic recording of cardiac activity in the amphibian *Rhinella arenarum*.



3 - As the Acquisition sessions progressed, cardiac reactivity was registered immediately upon presentation of the neutral solution, showing an anticipatory tachycardia to the aversive event. During Extinction, the aversive solution was replaced by a neutral one, which led to a gradual disappearance of this anticipatory cardiovascular response.

4 - These results would indicate a physiological adjustment of the cardiovascular system mediated by a learned response, probably part of an adaptive system to cope with threatening situations.

[1] Daneri, M. F., Papini, M. R., & Muzio, R. N. (2007). Common toads (*Bufo arenarum*) learn to anticipate and avoid hypertonic saline solutions. *Journal of Comparative Psychology*, 121(4), 419.

[2] Cervino, Claudio O.; Castillo, Lilian Fedra; Rodriguez, Enrique Marcelo; Systemic and lymphatic heart performance during forced submersion, in the toad *Bufo arenarum* (Annura, Bufonidae); Asociación Herpetológica Española; Revista Española de Herpetología; 21; -1-2007; 95-106.