

PHARMACOLOGY OF *PHONEUTRIA* VENOM

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Phoneutria nigriventer and *P. keyserling* (Ctenidae, Labidognata) are very aggressive wandering solitary spiders. They are responsible for most human accidents of araneism in Center East and South of Brazil. Their venoms are neurotoxic and very potent.^{1,3,5} The signs and symptoms evoked by them in animals or observed in human accidents are excruciating pain irradiating from the site of introduction, painful cramps, tremors, tonic convulsions, spastic paralysis, sialorrhoea, sudoresis, priapism, tachycardia, arrhythmias and visual disturbances.^{1,2,4} The venoms do not produce local edema or necrosis nor induce blood coagulation or hemolysis.¹ The mechanism of action of *P. nigriventer* venom was investigated in our laboratory^{5,7} at the isolated rat diaphragm and the isolated guinea pig auricles. In both preparations it was found that the venom produces effects by activating the sodium channels. In the rat diaphragm the venom induced depolarization of the muscle fibre membrane. This effect was abolished by tetrodotoxin (TTX) or by reduction of Na⁺ concentration in the bath fluid. The venom induced increase of the frequency of the miniature end plate potentials (m.e.p.p.) was also abolished by TTX. This last result shows that the sodium channels of the motor nerve terminal membrane are also activated by the venom.

In the isolated guinea-pig auricles, TTX in concentration that reduces only slightly ($23.6 \pm 6.2\%$) the tension of the muscle fibres abolished the remarkable effects of the venom on their chronotropism and inotropism. This shows that the venom acts by activating the sodium channels of the autonomic nerve endings in the auricles, thereby releasing acetylcholine and norepinephrine.

Phtx₂, a toxin of 5,000 daltons isolated from *P. nigriventer* venom by Diniz is about three times as lethal for mice as the venom (venom LD₅₀ i.v. 377 µg/kg; PhTx₂ LD₅₀ i.v. 130 µg/kg). It activates also the sodium channel being about 18 and 2 times as active as the venom in the rat diaphragm and in the isolated guinea pig auricles respectively.⁶

REFERENCES

1. BRAZIL, V. & VELLARD, J. Contribuição ao estudo do veneno das aranhas. *Mem. Inst. Butantan*, 2:5-77, 1925.
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