



Pretreatment of the cockroach cercal afferent/giant interneuron synapses with nicotinoids and neonicotinoids differently affects acetylcholine and nicotine-induced ganglionic depolarizations

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Auteur	Benzidane, Yassine [1], Leray, Xavier [2], Falaise, Charlotte [3], Quinchard, Sophie [4], Ceron-Carrasco, José Pedro [5], Jacquemin, Denis [6], Graton, Jérôme [7], Le Questel, Jean-Yves [8], Thany, Steeve Hervé [9]
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Résumé en anglais	<p>We have recently demonstrated that neonicotinoid insecticides were able to act as agonists of postsynaptic nicotinic acetylcholine receptors (nAChRs) expressed at the synapse between the cercal nerve XI and the giant interneurons, in the sixth abdominal ganglion. In this work, we demonstrated that nicotinoids such as nornicotine acted as an agonist of nicotinic acetylcholine receptors expressed at cercal afferent/giant interneurons while cotinine was a poor agonist. Indeed, nornicotine induced a ganglionic depolarization which was blocked by the nicotinic antagonist mecamylamine. In addition, we found that pretreatment of the sixth abdominal ganglion with 1 and 10 μM nornicotine and cotinine had no significant effect on acetylcholine and nicotine-induced depolarization. But pretreatment with 1 and 10 μM acetamiprid and imidacloprid had a strong effect. 1 and 10 μM acetamiprid completely blocked acetylcholine-induced depolarization, whereas imidacloprid had a partial effect. The present work therefore suggests, in agreement with previous studies, that nornicotine and cotinine bind to distinct cockroach postsynaptic nAChRs, whereas acetamiprid and imidacloprid have competitive effects with acetylcholine and nicotine on ganglionic depolarization.</p>

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