Nornicotine application on cockroach dorsal unpaired median neurons induces two distinct ionic currents: implications of different nicotinic acetylcholine receptors

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Résumé en anglais	The goal of the present study is to examine the agonist action of nornicotine on insect nicotinic acetylcholine receptors. Using patch-clamp techniques on cockroach dorsal unpaired median neurons, we demonstrated that nornicotine induced two distinct ionic currents named types 1 and 2. We found that alpha-bungarotoxin induced a rapid desensitization of type 1 currents whereas type 2 was completely blocked. Interestingly, types 1 and 2 currents were not blocked by the muscarinic antagonist, pirenzepine but by co-application of 1 muM pirenzepine and 0.5 muM alpha-bungarotoxin, suggesting that muscarinic receptors modulated nornicotine-induced current amplitudes. In addition, type 1 current amplitudes were strongly reduced by 20 muM d-tubocurarine and 5 muM mecamylamine which blocked the previously identified alpha-bungarotoxin-insensitive nAChR1 and nAChR2 receptors. Co-application of alpha-bungarotoxin with d-tubocurarine or mecamylamine completely blocked all ionic currents. We propose that types 1 and 2 currents are associated to several nicotinic receptors subtypes, including nAChR1 and nAChR2 receptors. Finally, we conclude that nornicotine could be used as an agonist to identify distinct insect nicotinic receptors.
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