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## In-vitro neurotoxicity of two Malaysian krait species (*Bungarus candidus* and *Bungarus fasciatus*) venoms: Neutralization by monovalent and polyvalent antivenoms from Thailand (Article)

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### Abstract

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*Bungarus candidus* and *Bungarus fasciatus* are two species of krait found in Southeast Asia. Envenoming by these snakes is often characterized by neurotoxicity and, without treatment, causes considerable morbidity and mortality. In this study, the in vitro neurotoxicity of each species, and the effectiveness of two monovalent antivenoms and a polyvalent antivenom, against the neurotoxic effects of the venoms, were examined in a skeletal muscle preparation. Both venoms caused concentration-dependent inhibition of indirect twitches, and attenuated responses to exogenous nicotinic receptor agonists, in the chick biventer preparation, with *B. candidus* venom being more potent than *B. fasciatus* venom. SDS-PAGE and western blot analysis indicated different profiles between the venoms. Despite these differences, most proteins bands were recognized by all three antivenoms. Antivenom, added prior to the venoms, attenuated the neurotoxic effect of the venoms. Interestingly, the respective monovalent antivenoms did not neutralize the effects of the venom from the other *Bungarus* species indicating a relative absence of cross-neutralization. Addition of a high concentration of polyvalent antivenom, at the  $t_{90}$  time point after addition of venom, partially reversed the neurotoxicity of *B. fasciatus* venom but not *B. candidus* venom. The monovalent antivenoms had no significant effect when added at the  $t_{90}$  time point. This study showed that *B. candidus* and *B. fasciatus* venoms display marked in vitro neurotoxicity in the chick biventer preparation and administration of antivenoms at high dose is necessary to prevent or reverse neurotoxicity. © 2014 by the authors; licensee MDPI, Basel, Switzerland.

### Author keywords

Antivenom [Bungarus candidus](#) [Bungarus fasciatus](#) [Krait](#) [Neurotoxicity](#) [Snake](#) [Venom](#)

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