

**THE OCULAR EFFECTS OF SPITTING COBRAS: II. EVIDENCE  
THAT CARDIOTOXINS ARE RESPONSIBLE FOR THE  
CORNEAL OPACIFICATION SYNDROME**

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**ABSTRACT**

Fractionation of *H. haemachatus*, *N. nigricollis*, *N. nivea* and *N. melanoleuca* venoms using Amberlite CG-50 and  $(\text{NH}_4)\text{HCO}_3$  elution gradient chromatography yielded 11-13 fractions for each venom. One fraction, F X, from *H. haemachatus*, two fractions, F X and F XI, from *N. nigricollis* and one fraction, F VIII, from *N. melanoleuca* venoms possessed the whole of ocular activity of the venoms. The fractions were the only venom fractions that caused cardiac depressant activity; their effect was reversed by raising  $\text{Ca}^{++}$  concentration in the physiological solution; they did not influence the twitches of the phrenic nerve hemidiaphragm and guinea-pig ileum preparations. Further purification of the fractions on Sephadex G-50 followed by fractionation on Amberlite CG-50 yielded fractions free from phospholipase  $\text{A}_2$  activity but possessing the same ocular effects. Similarly, the cardiotoxin from commercial *N. nigricollis* venom caused the same ocular

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