Pergamon

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VENOM YIELDS FROM SEVERAL SPECIES OF COLUBRID SNAKES AND DIFFERENTIAL EFFECTS OF KETAMINE

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R. E. Hill and S. P. Mackessy. Venom yields from several species of colubrid [illegible]

snakes are not killed, repeated extractions from the same snake can be made without apparent ill effects to the snake.

MATERIALS AND METHODS

Reagents

Protein concentration reagent was obtained from BioRad (U.S.A.). Ketamine–HCl was a product of Fort Dodge Laboratories (U.S.A.) All other reagents (analytical grade) were obtained from Sigma Biochemical Corp. (U.S.A.).

Snakes

rotein in saliva $\bar{x}$ (range)
ND
ND
ND
21.9
.9 (13.5–48)
ND
ND
7 (3.3–12.6)
ND
8.2

specimen had been administered ketamine previously. Some snakes were refractive to the effects of the anesthetic the first time ketamine was administered, but were subdued more readily and at lower dosages during subsequent extractions; other species, primarily *H. gigas*, seemed to be highly sensitive to ketamine and reacted violently every time it was administered. Neither specimen of *H. gigas* reacted when the needle was inserted subcutaneously, but both reacted with violent thrashing when the ketamine was [illegible]

[illegible]

recover for several days. Owing to the rapid onset of the anesthesia and prolonged effect that it had, dosage was cut from 60 μg/g to 15 μg/g. Although it took somewhat longer to anesthetize the snakes with this reduced dosage, the snakes recovered in a much shorter time, and adverse reactions diminished significantly. The recovery time for all specimens seemed to be shorter on subsequent injections, probably because of induction effects. Based on the highly prolonged effect on one specimen of *B. irregularis*, the combined use of xylazine and ketamine should be avoided.

Most of the snakes in this study showed little or no adverse reaction to ketamine. They [illegible] concentrations indicates that these secretions are indeed made up primarily of serous venom components.

It should be noted that for those species where liquid and dry yield data have been reported, the use of ketamine and pilocarpine results in a significantly larger volume yield of a more dilute secretion (see Table 2). It has been noted previously (Rosenberg, 1992; Rosenberg *et al.*, 1985) that the secretion obtained was less concentrated than that obtained without parasympathetic stimulation, and secretion composition does not seem to be affected (Rosenberg, 1992; Marmary *et al.*, 1987). However, the use of anesthetic and pilocarpine greatly facilitates collection of venom without undue stress to the snake, and total dry yields are still typically much greater than those obtained via other methods such as simple restraint and aspiration.

In conclusion, the administration of ketamine and pilocarpine appears to be tolerated [illegible]

species such as *H. gigas* tend to be sensitive to ketamine. The use of this method to obtain sufficient amounts of venom for detailed analyses now appears feasible even for small species, such as *Tantilla nigriceps*, which typically show extremely low venom yields. With the utilization of this technique, in conjunction with sensitive microanalytical techniques, the investigation of colubrid venoms should progress much more rapidly. We are currentl

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[redacted]

in the venom of the boomslang *Dispholidus typus*. *Toxicon* **7,** 189–194.

Rosenberg, H. I. (1992) An improved method for collecting secretion from Duvernoy's gland of colubrid snakes. *Copeia* **1992,** 244–246.

[redacted]