THE ACTION OF CARDIAC DRUGS UPON THE CHROMATOPHORES OF TOADS.*,[1]

BY CHESTER C. HARGREAVES, WILLIAM T. WINCHESTER AND K. K. CHEN.

In the assay of some cardiac substances in the nebulous toad, *Bufo valliceps* (1) (2), it was noted that a pallor of the dorsal skin occurred. Since this phenomenon has not been mentioned by previous workers, it may prove of interest to describe it in detail. Figure 1 illustrates the appearance of a toad injected with

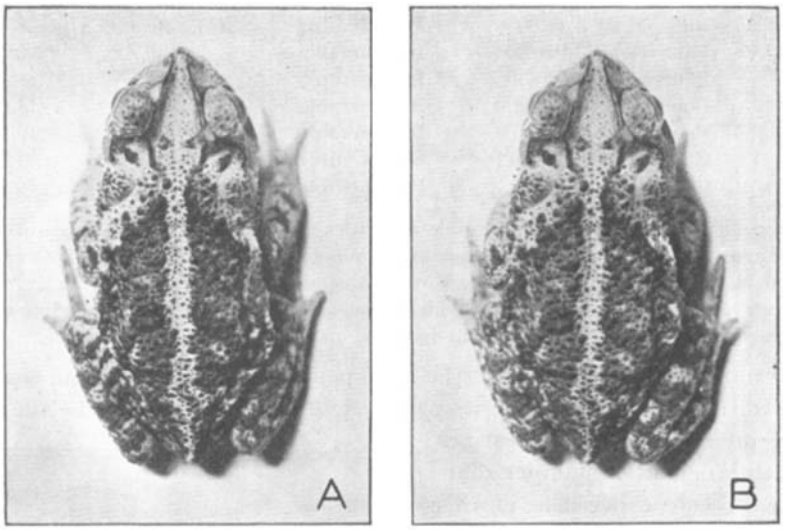

Fig. 1.—Color comparison between a couminginized toad and a control.

A. Control kept under the same conditions as B.

B. A toad was injected with coumingine hydrochloride, 0.175 mg. per Gm. The photograph was taken 40 minutes after the injection. The contrast in density between *A* and *B* is actually more pronounced than these pictures show.

coumingine hydrochloride as compared with that of a control animal. The difference in color between the two toads can be readily made out. To date, four cardiac drugs—ouabain, scillaren B, cymarin and coumingine hydrochloride—have been tested on toads, and apparently they all cause contraction of chromatophores. The reaction is definite with minimal systolic doses of each substance. Thus, the toad turns pale upon the injection into the lymph sac of the following doses: ouabain, 0.05 mg. per Gm.; scillaren B, 0.03 mg. per Gm.; coumingine hydrochloride, 0.175 mg. per Gm.; and cymarin, 1.1 mg. per Gm. Larger amounts, of course, produce the same effect. The change in color from dark to light usually takes place about 15 minutes after the administration of the drug, and becomes more evident 20 to 30 minutes later. The observation is best made when the toads are placed in perforated metal cages, away from any bright light. Rarely is this paleness absent following any of the drugs in the dosage stated. The cause of this change

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in coloration has not been determined. It is uncertain whether it may be a direct action upon the pigment cells, or a secondary effect resulting from the cardiac derangement under the influence of the drugs.

SUMMARY.

Ouabain, scillaren B, coumingine hydrochloride, or cymarin, when injected into the lymph sac of the nebulous toad, *Bufo valliceps*, causes noticeable blanching of the dorsal skin. The reaction is definite with the minimal systolic dose of each cardiac drug.

REFERENCES.

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THE CHEMISTRY OF PASSIFLORA INCARNATA.*

BY EDWIN J. FELLOWS[1] AND CLAYTON S. SMITH.**

INTRODUCTION.

Passiflora incarnata, one of about 125 species comprising the passion flower family, is a perennial climbing shrub found thriving in dry soils from Virginia to Florida and westward to Missouri and Arkansas. This drug has been used in medicine for almost one hundred years. While the drug is not found in either the current U. S. P. or N. F. it was recognized by N. F. V. There are at the present time, however, numerous hypnotic and sedative preparations of *Passiflora incarnata* on the market.

Fisher (1), the first to report on the clinical use of *Passiflora incarnata* stated that it was to be preferred to the bromides and chloral as a sedative, antispasmodic and hypnotic because the sleep it induced more closely approximated natural slumber. Sayre (2) in 1902 reported that passiflora had gained favor among practitioners in the treatment of insomnia, although there was some controversy as to its value. Three years later Stapleton (3) reported the successful use of tincture of passiflora in cases of insomnia from hysteria, neurasthenia and neuralgia. Leclerc (4) later reported the use of a tincture containing 50 per cent alcohol as a hypnotic and sedative with some degree of success. In the same year Hinsdale (5) reported demonstrations of a sedative action by means of reaction time experiments on human subjects. In the following year Hinsdale (6) reported diminution of acuteness of hearing of a number of human subjects after administration of tincture of *Passiflora incarnata*.

Discussions (7) concerning the components of passiflora are either to the effect that nothing is known about its chemical composition or that it is supposed to

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