

The occurrence of catecholamines in the sea anemone *Actinia equina*R. F. CARLYLE, *Department of Pharmacology, King's College, London*

Ostland (1954) in surveying the distribution of catecholamines in invertebrates concluded that adrenaline, noradrenaline and dopamine were not present in the three coelenterates examined, which included the sea anemone *Metridium dianthus*. He claimed, however, that there was an unknown catecholamine present, which he called "Catechol 4." Dahl, Falk, Von Mecklenberg & Myhrberg (1963) using the formaldehyde fluorescence microscopy technique demonstrated the presence of a fluorescent substance resembling noradrenaline in cells and fibres of the ectodermal nerve net of the tentacles in the anemones *Metridium senile* and *Taelia felina*. No such fluorescence was found in any other part of the anemone.

In the present work the pattern of fluorescence distribution in *Actinia equina* has been found to be similar to that described by Dahl *et al.* (1963) for *Metridium senile* and *Taelia felina*.

Anemones were extracted with perchloric acid and the amines adsorbed on to alumina, eluted and separated by ion exchange or partition paper or thin-layer chromatography. Spots resembling dopamine and DOPA were detected. However, this pattern was seen in only eight of nineteen experiments. In eleven experiments no spots corresponding to known catecholamines were seen, but biologically inactive spots of high *R_F* value were observed. No spot resembling "Catechol 4" was seen. The reason for these two patterns of distribution of spots was found in the observation that many batches of anemones contained a substance which interfered with the normal travel of catecholamines on chromatographic media. This unidentified substance was removed by suitable ion exchange chromatography of the alumina extract, after which clear identification and separation of DOPA, dopamine and noradrenaline in extracts of *Actinia equina* was obtained. Identification was based on behaviour in chromatographic, fluorometric and biological tests. The concentrations of these three amines in whole anemones have been found to be low; DOPA 17 ± 4 ng/g, dopamine 14.1 ± 5.5 ng/g and noradrenaline 4.7 ± 0.6 ng/g (mean \pm s.e. of eight experiments). Adrenaline, if present, occurs at a concentration of <0.2 ng/g. As expected from the fluorescence microscopy studies, the bulk of the noradrenaline is found to be present in the tentacles.

REFERENCES

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Evidence for a molecular change in acetylcholine receptors produced by agonistsH. P. RANG and J. M. RITTER*, *Department of Pharmacology, University of Oxford*

Drug antagonism was studied using isometric contractions of thin strips of chick biventer cervicis muscle, suspended in Krebs solution at 37° C and stimulated with carbachol or suxamethonium. Tubocurarine and gallamine both behaved as conventional competitive antagonists, with dissociation equilibrium constants of 3.78×10^{-7} M and 4.70×10^{-7} M respectively.