

Amine oxidase activity in tissues of the leech (*Hirudo medicinalis*)

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The presence of 5-hydroxytryptamine (5-HT) and of aromatic decarboxylase in the leech ganglia (Coggeshall, Dewhurst, Weinreich & McCaman, 1972; McCaman, Weinreich & McCaman, 1973) might suggest that 5-HT has a neurotransmitter function in the leech. We therefore decided to study the distribution of amine oxidase activity in the leech tissues to shed light on 5-HT metabolism in this species. Amine oxidase activity was measured by a radiometric method (Callingham & Della Corte, 1972) and all the assays were done in duplicate. No leech tissues examined during the February-April period showed a measurable amine oxidase activity towards 5-HT or tyramine. However, using benzylamine as a substrate, activity was demonstrable in samples of leech

whole viscera, crop and stomach plus intestine (Table 1). From the results obtained in the presence of clorgyline or NaCN (2.5-5 mM), such an activity appeared to be largely of the 'mitochondrial type' in the whole viscera samples and mainly of the 'soluble type' in the crop samples. On the other hand, results using pargyline and semicarbazide (2 mM), would indicate that the presence of a 'mitochondrial type' enzyme is unlikely. Enzymatic activity was higher in December when a slight tyramine inactivation by whole viscera and crop specimens was observed. Rat heart homogenates run in parallel with the leech samples inactivated 5-HT, tyramine and benzylamine.

Although the leech tissues exhibit some amine oxidase activity in the alimentary system, no evidence of 5-HT oxidative deamination was thus obtained.

These results together, with the inability to demonstrate directly tryptophan hydroxylase in the leech ganglia (Hildebrand, Barker, Herbert & Kravitz, 1971), seem to indicate that 5-HT metabolism in this species differs from that in mammals. Further investigation is necessary before a neurotransmitter role may be attributable to 5-HT in the leech.

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Table 1 Amine oxidase activity in leech tissues

	nmol h ⁻¹ mg protein ⁻¹	n
Whole viscera	0.589 ± 0.288	6
Muscle	<0.1	7
Ventral nerve cord	<0.1	7
Crop	0.342 ± 0.115	3
Stomach + intestine	0.515 ± 0.152	4

The incubation time was 30 min at 37°C in O₂ filled tubes using benzylamine (1 mM) as a substrate. The results are the mean ± s.e.

n, number of experiments carried out from February through to April.

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