

Presence of Hypothalamo-Hypophysial Portal System in the Teleost *Heteropneustes fossilis* (Bl.)

A conventional pituitary portal circulation is reported to be absent in the teleosts. Instead, the capillary plexus of the neurohypophysis which drains through the adeno-hypophysial tissue has been assumed to play the role similar to that of the primary plexus of tetrapods¹⁻⁹. However, in *Phoxinus phoxinus*¹⁰, *Channa punctatus*¹¹ and *Clarias batrachus*¹² a vascular link between the hypothalamus and hypophysis is reported.

In *H. fossilis* the median hypophysial artery takes its origin from the internal carotid and in turn gives out

several branches, some of which penetrate into the brain. Few of them ramify extensively to form the primary capillary plexus of the median eminence which extends from the anterior margin of the rostral pars distalis to the point of origin of the median neurosecretory tracts (Figures 1 and 2).

The fine axons of the preoptic nuclei join and form the left and the right main tracts which, while proceeding towards the pituitary, give rise to several pairs of lateral tracts that unite to form the paired median tracts. The main and median tracts approximate together at the pituitary stalk and form the common tract which enters the pituitary (Figure 2). The median tracts, the part of lateral tracts proximal to it and the common tract lie in close association with the primary capillary plexus. Several fine axons of the lateral tracts end upon the blood vessels. The presence of abundant Herring material around blood vessels all along the median eminence suggests a direct transfer of active principles into the primary plexus which irrigates the pars distalis through the portal vessels (Figures 1 and 3). GREEN's¹ definition of the median eminence as that part of the neurohypophysis which receives its blood supply from the hypothalamo-hypophysial portal circulation, or which has a common vascularization with the adeno-hypophysis, fits well for *H. fossilis*.

This may be the first time that the presence of a hypothalamo-hypophysial portal circulation of tetrapodan type is convincingly demonstrated in a teleostean species. The details will be published elsewhere.

Zusammenfassung. Durch Injektion von Tusche wird nachgewiesen, dass bei Teleostiern auch ein Pfortadersystem zwischen Hypothalamus und Hypophyse vorhanden ist. Diese Gefäßversorgung ist sonst nur bei höher entwickelten Tieren bekannt und ist funktionell das Übermittlersystem für die Neurosekretion.

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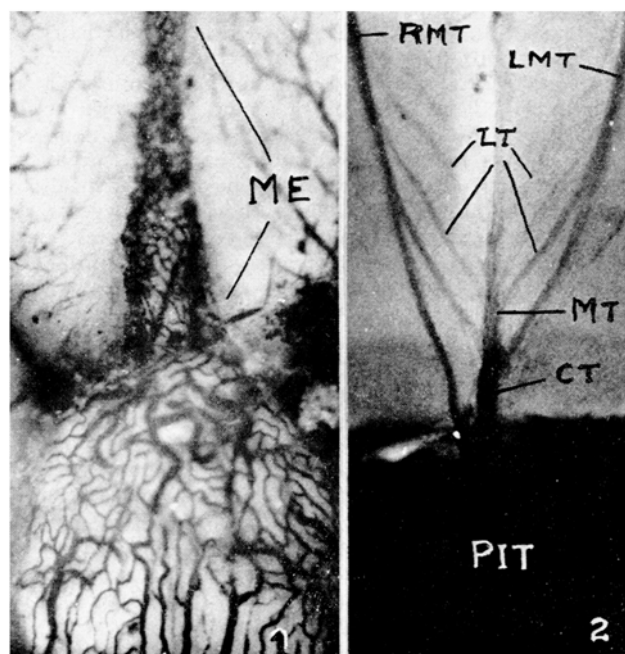


Fig. 1. Ventral view of the India ink injected pituitary of *H. fossilis* showing the median eminence with the primary capillary network and portal vessels entering the pars distalis. $\times 100$.

Fig. 2. Ventral view of the posterior $\frac{2}{3}$ of the hypothalamo-hypophysial neurosecretory system stained in situ with aldehyde fuchsin. $\times 100$. RMT, right main tract; CT, common neurosecretory tract; LT, lateral tract; LMT, left main tract; MT, median tract; ME, median eminence; PIT, pituitary.

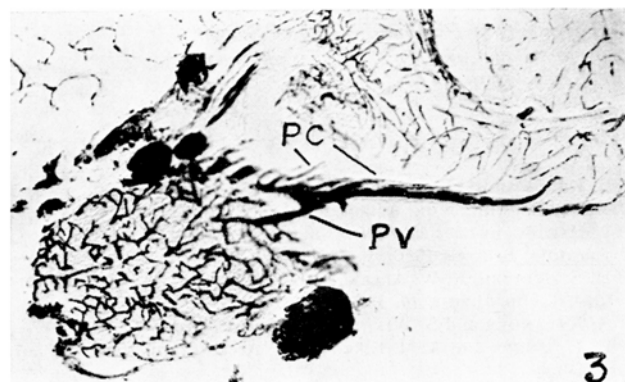


Fig. 3. Sagittal section of ink injected hypothalamus showing primary capillary network and the portal vessel entering the pars distalis. $\times 60$. PC, primary capillary network; PV, portal vessel.

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- ¹³ The authors are thankful to Dr. K. N. UDUPA, Surgical Research Laboratory, College of Medical Sciences, and Dr. L. M. SINGH for providing all facilities and encouragements. The junior author is indebted to the Council of Scientific and Industrial Research of India for the award of Junior Research Fellowship.