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Non-specificity of Anuran Hypophyses in Induction of Ovulation in Toads.*

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Experiments were conducted to determine the specificity of the anuran hypophysis in producing ovulation in the toad *(Bufo americanus)*. Houssay, Giusti, and Lascano-Gonzalez[1, 2] advanced the theory of "zoological specificity" when they were unable to secure ovulation in toads *(Bufo arenarium)* using hypophysis implants from several classes of animals, including frogs. They were, however, able to start ovulation in frogs, using hypophysis implants from toads. Adams[3] repeated these experiments, using European species and also made additional experiments using mammalian extracts of the anterior lobe and concluded that only the hormone produced by the toad could stimulate toad ovaries to release their

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[1] Houssay, B. A., Giusti, L., Lascano-Gonzalez, J. M., *Compt. Rend. Soc. Biol.*, 1929, **102**, 864.

[2] Houssay, B. A., Giusti, L., Lascano-Gonzalez, J. M., *Rev. Soc. Argent. Biol.*, 1929, **5**, 397.

[3] Adams, A. E., PROC. SOC. EXP. BIOL. AND MED., 1931, **28**, 677.

eggs. Recently Bardeen[4] has reported the failure to produce ovulation in *Bufo americanus* after implanting 2 frog hypophyses daily for 15 days.

Adams[5, 6, 7] and Burns and Buyse[8, 9] have shown that in urodeles the use of mammalian extracts of hypophysis or the use of heteroplastic implants from various groups of animals causes ovulation in sexually mature females. From the above results it is seen that the toads are the only group of amphibians in which there is a supposed specificity of hypophysis hormone.

In the authors' experiment 2 females of *Bufo americanus* were taken from the general stock on October 14th to be used as recipients of implants of hypophyses from frogs. The implants were placed in the dorsal lymph sac just posterior to the head. Each female received 4 hypophyses daily. The first day each was given 3 implants from *Rana sphenocephala* and 1 from *Rana pipiens* and the following day the donors were all of the latter species. The first female ovulated completely on the third day after having received, altogether, 8 frog hypophyses. The second female likewise ovulated on the third day but after having received 12 frog hypophyses. The eggs were normal, as evidenced by development from natural and artificial fertilization. A male had been placed with each female and the first pair were in amplexus. The males received no implants. As controls a group of 8 females kept for general stock were used. Thus far none of the controls have ovulated. Other experiments were conducted with toads from the same stock, using homoplastic implants in which case 6 of the 8 females used ovulated within 2 to 4 days. Of the 2 not laying eggs, 1 was killed after the fourth day and mature eggs were found in the ovary. The second was found on autopsy to be an immature female.

Our work completes the proof that the hypophysis hormone (anterior lobe) is non-specific in anurans and probably for all amphibia. The possible reason for the failure of other workers to induce ovulation in toads by heteroplastic implants may have been due to physiological conditions of either the recipients or donors, or both.

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[4] Bardeen, H. W., PROC. SOC. EXP. BIOL. AND MED., 1932, **29**, 864.

[5] Adams, A. E., PROC. SOC. EXP. BIOL. AND MED., 1930, **27**, 433.

[6] Adams, A. E., *Anat. Rec.*, 1930, **45**, 250.

[7] Adams, A. E., *Anat. Rec.*, 1931, **48**, Suppl. 37.

[8] Buyse, A., and Burns, R. K., Jr., PROC. SOC. EXP. BIOL. AND MED., 1931, **29**, 80.

[9] Burns, R. K., Jr., and Buyse, A., *Anat. Rec.*, 1931, **51**, 155.