3. LEWIS, M. R., and MIDER, G. B. *J. Natl. Cancer Inst.*, **2**, 115 (1941).
4. LEWIS, M. R., and MAXWELL, D. B. *Surgery*, **30**, 689 (1951).
5. ALLEN, F. M. *Arch. Surg.*, **41**, 79 (1940).
6. ———. *Federation Proc.*, **3**, 89 (1944).
7. ZAHL, P. A. *Science*, **114**, 180 (1951).
8. LEWIS, M. R., and APTEKMAN, P. M. *Cancer*, **5**, 411 (1952).
9. LEWIS, M. R., and GOLAND, P. P. *Am. J. Med. Sci.*, **215**, 282 (1948).
10. LEWIS, M. R., GOLAND, P. P., and SLOVITER, H. A. *Cancer Research*, **9**, 736 (1949).

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A New Articular Facet in the Upper Jaw of the Cyprinid Fish Genus *Pseudorasbora*

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In the teleosteans, the upper jaw articulates with the cranium in two regions: anteriorly, the palatine gains articulation with the lateral aspect of the preethmoid bone and there is also a ligamentary connection of the palatine in front of this; posteriorly, the hyomandibula articulates by a single or double head with the sphenotic-pterotic region. This is the methyostylic suspension.

While examining the skulls of fishes of the subfamily Gobioninae (Cyprinidae), I noticed in *Pseudorasbora parva* (Temminck and Schlegel) an interesting additional articulation of the upper jaw. Besides exhibiting the palatine (Fig. 1: ligament facet; preeth. fac.) and hyomandibular (hyomand.) articulations, the upper jaw of *Pseudorasbora* has also gained an articulation by its entopterygoid (entoptery). The latter has a prominent process (prevom. facet) mesially, slightly anterior to its joint with the palatine, by which it articulates with a well-developed facet on the prevomer. This articulation is just behind that of the palatine with the lateral face of the preethmoid.

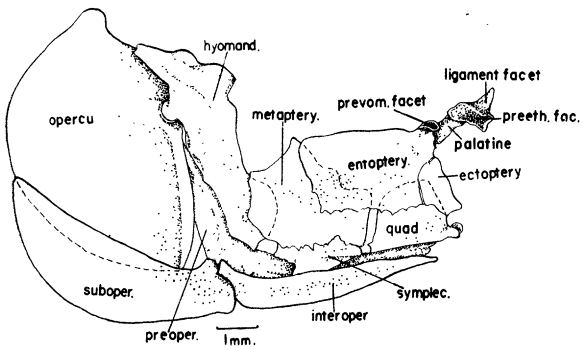

FIG. 1. Mesial aspect of the upper jaw of *Pseudorasbora parva*.

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The entopterygoid and palatine articulations are both anterior to the lateral ethmoid bone. Exactly how this additional strengthening is helpful to the animal is difficult to say. The fish lives in placid waters, and therefore the new joint may not be adaptational. Even the young of *Pseudorasbora* show the presence of a typical entopterygoid-prevomer joint.

As far as I am aware, the entopterygoid articulation of the upper jaw with the prevomer in the ethmoid region has so far not been recorded for any fish.

Bibliography

ALLIS, E. P. *J. Morphol.*, **18**, 45 (1903).
DE BEER, G. R. *The Development of the Vertebrate Skull.* Oxford: Oxford Univ. Press, (1937).
GIRGIS, S. *J. Morphol.*, **90**, 281 (1952).
GOODRICH, E. S. *Structure and Development of Vertebrates.* London: Macmillan (1930).
GREGORY, W. K. *Biol. Bull.*, **7**, 55 (1904).
——— *Trans. Am. Phil. Soc.*, **23**, 75 (1933).
HOLMGREN, N., and STENSIÖ, E. *Handbuch vergl. Anat. Wirbelt.* (Bolk, Göppert, Kallius, Lubosch) **4**, (1936).
POLLARD, H. P. *Anat. Anz.*, **10**, 17 (1895).
ROMER, A. S. *Vertebrate Palaeontology.* Chicago: Univ. of Chicago Press (1945).
STARKS, E. C. *Stanford Univ. Pub. Biol. Sci.*, **4**, 139 (1926).

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Synergism and Antagonism of Auxin by Antibiotics[1]

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Various compounds have been found to increase the activity of auxins and others to inhibit or reverse their action (*1–3, 6, 8–10*). This report is concerned with similar effects produced by antibiotics. Three methods were used to test the effects of antibiotics on growth responses of plant materials to indoleacetic acid (IAA): (1) the *Avena* section test of Bonner (*7*), (2) development of cucumber seedlings in sterile agar, and (3) development of cucumber seedlings in moist chambers.

According to the first method, IAA increases elongation of sections of *Avena* coleoptiles floated in the test solution. When used alone, the antibiotics oxytetracycline (terramycin), chloramphenicol, and streptomycin, up to 25 ppm, had no significant effect on elongation, but when used together with IAA (1 ppm) there was greater elongation than from IAA alone. There were no consistent differences in the effects of concentrations of the antibiotics between 1 and 25 ppm. The response to streptomycin in repeated tests was more variable than that to the other two compounds. Citrinin, thiolutin, and clavacin, when used alone, inhibited elongation somewhat, but when used with IAA they reduced the growth-induc-

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