The separation and purification of these hypoglycaemic principles is in progress.

H. D. BRAHMACHARI.
K. T. AUGUSTI.

Dept. of Biochemistry,
Birla College,
Pilani, India.
April 3, 1961.

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5-Hydroxytryptamine in Pineapples

SIR,—In view of the conflicting reports concerning the presence of 5-hydroxytryptamine (5-HT) in pineapples (Bruce, 1960; Foy and Parratt, 1960; West, 1960; Bruce, 1961), we have obtained the following results which we think will resolve the differences between Bruce, West and ourselves.

(*a*) Acetone extracts of the pulp of both unripe and ripe fruits contain a substance indistinguishable from 5-HT when assayed on the isolated rat uterus and rat colon preparations in the presence of atropine (10^{-7}). The contractions produced by both extract and standard 5-HT were antagonised by a specific anti-5-HT substance, bromolysergic acid diethylamide in a concentration of 2×10^{-8}–10^{-7}. There appeared to be more in unripe fruit (50 and 60 μg./g.) than in ripe fruit (19 μg./g.—an average of six estimations). A trace was also detected in stalk (0·2 μg./g.) but none in the leaves of the crown ($<$0·08 μg./g.) or base ($<$0·08 μg./g.).

(*b*) Juice squeezed from the pulp of ripe fruits contained 5-HT in a concentration of 13–22 μg./ml., an average of eleven estimations being 16 μg./ml.

(*c*) Canned pineapple juice contained much less than this, and certainly nothing like the amounts quoted by Dr. Bruce (Bruce, 1960; 1961). One brand of Australian juice contained 3·5, 4,6 and 8 μg./ml. and a Nigerian brand even less (1·3–4·2 μg./ml.—an average of 2·8 μg./ml. from six estimations).

There are three possible reasons for our previous failure to detect 5-HT in pineapple extracts (Foy and Parratt, 1960) and for the continuing discrepancy in the values for canned juice.

(i) There may be an enzyme in pineapple which destroys 5-HT, a situation already known to occur in the nettle plant (Collier and Chesher, 1956). But we have been unable to detect such an enzyme using a modification of the method used by Collier and Chesher.

(ii) Both fresh and canned pineapple juices are acid (pH 3·6–3·9). 5-HT is unstable in acid solution (Erspamer, 1940; Parratt, 1958), particularly when heated (Erspamer, 1940; Amin, Crawford and Gaddum, 1954). This would decrease the stability of 5-HT in acetone extracts of acid pulp and explain the lower values for canned juice compared with fresh juice.

(iii) Our figures for 5-HT are calculated as base. Dr. Bruce mentions "serotonin" (Bruce, 1960) and "indole derivatives" (Bruce, 1961). If his results are calculated using 5-HT creatinine sulphate as his standard then his published results would need to be halved. This would bring them more in line with the above results.

The likelihood of an erroneous diagnosis of a carcinoid tumour by pineapple ingestion is, in our opinion, small. It would surely be much more likely to occur in countries where the staple diet contains 5-HT, as in parts of West Africa where plantains (containing large amounts of this substance) are ingested regularly (Foy and Parratt, 1960).

J. M. FOY.
J. R. PARRATT.

Department of Pharmacy,
Nigerian College of Technology,
Ibadan, Western Nigeria.

April 25, 1961.

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The Effects of Gallamine, Carbachol, Nicotine, Ryanodine and Protoveratrine A and B upon Flux of Calcium-47 in Frog Skeletal Muscle

SIR,—We recently reported the effects of tubocurarine, decamethonium, suxamethonium, edrophonium and neostigmine on $^{47}Ca^{++}$-uptake and release in frog sartorius muscle, and compared these with their influence upon uptake and release of $^{42}K^{+}$ and on $^{24}Na^{+}$-uptake (Ahmad and Lewis, 1961). Using similar techniques, we have extended our observations to make a preliminary study of the effects of gallamine, carbachol, nicotine, ryanodine and protoveratrine A and B.

From 1 to 8 mg./ml. of gallamine did not significantly alter $^{47}Ca^{++}$-uptake ($P = 0{\cdot}4 < 0{\cdot}3$) or release. At similar dose levels there was no significant change in $^{42}K^{+}$-uptake ($P = 0{\cdot}2 < 0{\cdot}1$) or release, or in $^{24}Na^{+}$-uptake ($P = 0{\cdot}7 < 0{\cdot}6$).

Carbachol (5 mg./ml.), did not significantly alter uptake of $^{47}Ca^{++}$ ($P = 0{\cdot}3 < 0{\cdot}2$) but its effects upon release were variable. It caused depression of $^{42}K^{+}$-uptake ($P = 0{\cdot}1 < 0{\cdot}05$) with a slight increase in its release but there was no change in $^{24}Na^{+}$-uptake ($P = 0{\cdot}8 < 0{\cdot}7$).

The effects of nicotine were more striking than those of gallamine or carbachol. 1 mg./ml. of nicotine caused a very significant increase in $^{47}Ca^{++}$-uptake ($P = > 0{\cdot}001$), $^{47}Ca^{++}$-release and $^{42}K^{+}$-release. It also markedly decreased $^{42}K^{+}$-uptake ($P = > 0{\cdot}001$) and significantly increased $^{24}Na^{+}$-uptake ($P = > 0{\cdot}02$).

Ryanodine at bath concentrations of 10 to 100 μg./ml. increased markedly both release, and uptake ($P = 0{\cdot}01 < 0{\cdot}001$) of $^{47}Ca^{++}$. With 50 μg./ml. of