others e.g. Trichosanthes anguina (snake gourds), Momordica charantia (bitter gourds) etc. contain conjugated triene acids in addition to oleic and linoleic acids. The present communication relates to Momordica dioica and Trichosanthes cucumerina, belonging to two different genera of the Cucurbitacae family. The characteristics of the fat as determined by standard methods are (M. d. = Momordica dioica; T. c. = Trichosanthes cucumerina):

% oil: M. d. 33,5 (on kernel, kernel is 65% of the whole seed), T.c. 28 (on whole seed). Ref. ind. at 40° C: M.c. 1·4945, T.c. 1·4881. Saponification equivalent: M.d. 296·0, T.c. 300·8. % Non-saponifiables: M.d. 0·9, T.c. 1·2. Iodine value (Wij's 30 mins): M.d. 114·0, T.c. 134·7 (these are not true iodine values because of the presence of conjugated acids). Free fatty acids (% as oleic acid): M.d. 1·4, T.c. 17·0. Colour of oil: M.d. and T.c. dark brown.

The composition of the mixed fatty acids were found out by the modern spectro-photometric techniques recently elaborated by HILDITCH *et al*[2]). The saturated acids were determined by BERTRAM's oxidation method[3]) as modified by PALIKAN and V. MIKUSH[4]). The percentage of oleic acid was found by difference. The conjugated acids have been expressed as α-eleostearic, but it is most likely that they are present in the form of its geometrical isomer trichosanic acid, as was shown by AHLERS[5]) in the case of conjugated acids obtained from other members of the family. The results are:

Saponification equivalent: M.d. 282·1, T.c. 287·0. Iodine values (Wij's 30 mins): M.d. 120, T.c. 143·8 (see above). $E^{1\%}_{1\,cm}$ at 270·5 mμ (unisomerised): M.d. 970, T.c. 635; at 268 mμ (isom. at 170° C/15 mins): M.d. 880, T.c. 575; at 234 mμ (isom. at 180°/60 mins): M.d. 188, T.c. 240.

Composition of mixed fatty acids (excluding nonsaponifiables), % by weight. Saturated acids: M.d. 27·1, T.c. 11·87. Unsaturated acids, oleic (by difference): M.d. 9·2, T.c. 32·84; linoleic: M.d. 8·8, T.c. 19·83; conjugated triene (as α-eleostearic): M.d. 54·9, T.c. 35·46.

From the nature of the fatty acid composition it seems that the seed fats may be utilizable as drying oils in the Paint and Varnish Industry either as such or after seggregation into suitable fractions by treatment with solvents. A detailed report embodying further work will be published elsewhere.

Department of Applied Chemistry, University College of Technology, 92, Upper Circular Road, Calcutta-9

M. M. CHAKRABARTY, S. BHATTACHARYYA, M. J. DESAI and S. A. PATEL

Eingegangen am 3. Oktober 1956

[1]) CHOWDHURY, D. K., M. M. CHAKRABARTY and B. K. MUKHERJI: Naturwiss. 42, 344 (1955).

[2]) HILDITCH, T. P.: The Chemical Constitution of Natural fats, 3rd edit. London: Chapman & Hall 1956. — HILDITCH, T. P., R. A. MORTON and J. P. RILEY: Analyst 70, 68 (1945). — HILDITCH, T. P., C. B. PATEL and J. P. RILEY: Analyst 76, 81 (1951).

[3]) BERTRAM, S. H.: Z. dtsch. Öl- u. Fettindustr. 45, 733, 736 (1925).

[4]) PALIKAN and V. MIKUSH: Oil and Soap 15, 149 (1938).

[5]) AHLERS, N. H. E., and A. C. DENNISON: Chem. and Ind. 1954, 603. — AHLERS, N. H. E., A. C. DENNISON and L. A. O'NEILL: Nature [London] 173, 1045 (1954).

Effect of X-rays on the Oxygen Uptake of Cicer Arietinum T 87 seedlings

Recently MIKAELSON and HALVORSEN[1]), SUSSMAN[2]) and GOVINDJEE[3]) have recorded interesting variations in the oxygen uptake of irradiated barley seedlings, potato tubers and wheat seedlings respectively. The present investigation deals with the effect of 2000 r (X-rays given at the rate of 65 r per minute from an X-ray therapy model working at 250 kV and 10 mAmps) on the oxygen uptake of Cicer arietinum seedlings.

Respirometric studies were made with BRAUN's and WARBURG's apparatus. Measurements of gas exchange were started after two days of irradiation and were taken after giving 30 minutes of equilibration. In each case average readings of at least ten seeds were taken and the results represent an average of eight such readings, for daily readings were taken for 4 hours and the two sets were run in duplicates.

Measurements carried at 25° C and 30° C (Fig. 1) revealed that the consumption of O_2 remains fairly similar in both the control and irradiated sets till the fourth day of germination. On the fifth day a decrease of 28 μl and 35 μl in the oxygen uptake per ml of material per hour, was observed at 25° C and 30° C respectively. On the sixth day the decrease (as compared to the control) was 44 μl (25° C) and 55 μl (30° C) per ml of the material per hour. These differences in the oxygen uptake were calculated to be 46% and were found to be significant.

The effect of X-rays on enzymes in vitro is fairly well known[4]) and the O_2 uptake of various seedlings (Triticum, Hordeum, Cicer) decreasing on irradiation is also known. These facts point to the possibility that this "distant" effect of X-rays on the O_2 uptake may be through its effect on enzymes. However, GORDON[5]) found out that the effect is secondary rather than primary.

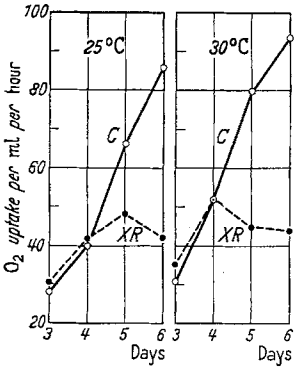


Fig. 1. Graphs showing O_2 uptake of Cicer seedlings. *XR* X-rayed; *C* control

Further work on the elucidation of the mechanism of X-ray action is needed.

The author is thankful to Prof. SHRI RANJAN for the lab. facilities while the work was conducted at Allahabad University, India. Dr. DEY (of K. N. M. H., Allahabad) and Messrs. M. M. LALORAYA, T. RAJARAO, B. MALVIYA and Miss RAJNI VARMA are also to be thanked for their valuable help.

Botany Department, University of Illinois, Urbana, Ill., USA

GOVINDJEE

Eingegangen am 6. Oktober 1956

[1]) MIKAELSON, K., and H. HALVORSEN: Physiol. Plantarum 6, 873 (1953).

[2]) SUSSMAN, A. S.: J. cellular Physiol. 42 (2), 273 (1953).

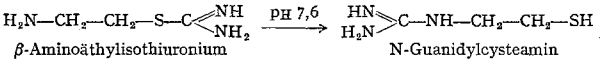
[3]) GOVINDJEE: Unpublished. 1956.

[4]) BARRON, E. S. G., et al: J. gen. Physiol. 32, 537 (1949). — BARRON, E. S. G., and V. FLOOD: Arch. of Biochem. a. Biophysics 41 (1), 203 (1952). — DALE, W. M., et al.: Philos. trans. Roy. Soc. London, Ser. A 242, 33 (1949). — HOLMES, B.: Nature [London] 165, 266 (1950).

[5]) GORDON, S. A.: Personal Communication 1956.

β-Aminoäthylisothiuronium als peroral wirksame Strahlensubstanz

DOHERTY und BURNETT[1]) beschrieben die Schutzwirkung des β-Aminoäthylisothiuroniums bei röntgentotalbestrahlten Mäusen. In unserem Institut wurde von HAGEN und BLUMENFELD[2]) nachgewiesen, daß sich die meist als Bromid-Hydrobromid oder Chlorid-Hydrochlorid vorliegende Verbindung im physiologischen p_H-Bereich zu N-Guanidylcysteamin umlagert. Damit ist sie zur Gruppe der Cystein-Cysteaminschutzkörper[3]) zu zählen.



Wir haben im folgenden die Schutzversuche auf Ratten ausgedehnt und neben der parenteralen Applikation auch die perorale gewählt. *Material und Methode:* 120 bis 140 g schwere männliche Ratten eines institutseigenen Inzuchtstammes werden in Gruppen zu vier Tieren in einem Trolitulkästchen mit 500 r totalbestrahlt. Die Überlebensquote wird im Zeitraum von 30 Tagen post radiationem bestimmt. Jede einzelne Untersuchungsgruppe besteht aus 50 Tieren. Bei der peroralen Gabe erhalten die seit 12 Std nüchternen Ratten β-Aminoäthylisothiuronium per Sonde. — Die Bestrahlungsbedingungen sind folgende: Röntgenapparatur der Fa. C. H. F. Müller/Hamburg M.G. 150; bei 150 kV und 20 mA ergibt sich eine Dosisleistung von 120 r/min; 0,5 mm Cu, HWS = 0,87 mm Cu, Abstand: Fokus—Tier: 30 cm, totale Bleiabschirmung nach allen Seiten, so daß keine Rückstreuung erfolgt bis auf jene von Tier zu Tier.

Ergebnisse zeigt Tabelle 1.

Tabelle 1. *Prozent überlebender Tiere nach 30 Tagen*

Nr.	Behandlung	Überlebende Tiere %	*P*-Wert zu den Kontrollen
1	Kontrolle	28,0	
2	30 mg; 10 min[a])	66,0	*P*: 0,001
3	80 mg; 30 min[b])	54,0	*P*: 0,01—0,001

a) 30 mg β-Aminoäthylisothiuronium-Br-BrH/Tier 10 min vor der Bestrahlung i. p. — b) 80 mg β-Aminoäthylisothiuronium Br-HBr/Tier 30 min vor der Bestrahlung per os (Sonde).