Table 1. EFFECTS OF GIBBERELLIC ACID ON *Eucalyptus melliodora*

Gibberellic acid (μgm./ml.)	Leaf weight (mgm./plant)	Weight of stems (mgm./plant)	Root weight (mgm./plant)	Total weight (mgm./plant)	Height (mm.)	Diameter (mm.)	No. of leaves on main stem
Control	344	84	202	630	122	1·64	15·0
1	272	92	187	551	158	1·83	16·5
5	279	136	170	585	249	1·83	19·4
25	210	171	140	521	320	1·97	18·2
50	223	236	133	592	396	2·12	20·0
100	232	323	142	697	471	2·19	20·6
Test of regression F (2, 21 d.f.)	3·00	21·57	3·71	1·02	18·71	12·38	11·96
Significance	$P < 0·10$	$P < 0·001$	$P < 0·05$	n.s. at $P = 0·10$	$P < 0·001$	$P < 0·001$	$P < 0·001$

overall effect of treatment appeared to be, therefore, an alteration in the relative weights of stems, leaves and roots; increase in stem weight was achieved at the expense of leaf and root weights. A reduction in axillary branch number was observed but has not as yet been confirmed. Until the results of anatomical investigations are available, it is uncertain whether the increase in stem diameter is the result of increased cambial activity or merely increased cell size. No effect of treatment on ligno-tuber formation was apparent.

Plants treated with gibberellic acid developed the alternate arrangement and falcate-lanceolate shape of leaves characteristic of adult plants of *E. melliodora* earlier than control plants. This raises the possibility that gibberellic acid or similar substance, formed within the plant, might normally be a factor controlling leaf shape. The recent use of gibberellic acid to convert adult to juvenile foliage in a species of *Hedera*, though the opposite effect to that here anticipated, is of interest in this connexion[2].

We are grateful to Mr. G. A. McIntyre for the statistical treatment of the results in Table 1.

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[1] Marth, P. C., Audia, W. V., and Mitchell, J. W., *Bot. Gaz.*, **118**, 106 (1956).
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Rapid Determination of Casein in Milk

MORE than half the total acidity of milk is due to casein. This casein, which occurs in the form of calcium caseinate, can be removed by curdling the milk with rennet. The amount of calcium bound to casein is related to the acidity of the milk; the higher the acidity, the lower the calcium content of the casein. We therefore conclude that the casein content can be determined on the basis of milk acidity and of acidity of whey obtained by rapid precipitation of the calcium caseinate with rennet; it will be proportional to the difference between total milk acidity and acidity of whey. Moreover, for a given milk in which the casein content does not change, this difference will be higher, the higher the milk acidity at the moment of adding rennet. Hence the coefficient used for multiplying the difference between milk and whey acidity for determining the casein content must be lower the higher the acidity of the milk under investigation. This determination should not be affected by the development of microflora in the milk (as is the case with the formol method), since amino- and carboxyl-groups are liberated equally.

On the basis of these theoretical considerations, the following method was developed:

(1) The acidity of the milk under investigation is determined in Soxhlet–Henkel degrees. This is the titre of $N/4$ sodium hydroxide with 100 ml. of milk, using 2 ml. of a 2 per cent alcoholic solution of phenolphthalein as indicator.

(2) 10 ml. of a 1 per cent aqueous solution of rennet is added to 90 ml. of the milk under study. The mixture is then heated on a water bath, first at 40° C., later at around 60° C. in order to accelerate the curdling and separation of whey. The whole operation, including the separation of a sufficient amount of whey, should not take longer than 5 min.

(3) The acidity of the whey obtained is determined in Soxhlet–Henkel degrees. The casein content is calculated from the equation $x = (a - 1·11b)k$, in which x is the percentage casein content of milk, a is the milk acidity and b the whey acidity in Soxhlet–Henkel degrees, k is the ratio: casein percentage/milk acidity minus whey acidity, and the coefficient resulting from the dilution of milk with the rennet solution is 1·11.

A number of such determinations on milk from the Warsaw Voivodship was carried out at this Institute, together with simultaneous determinations by the Kjeldahl method. k was calculated in each determination for various milk acidities. It was found to depend on milk acidity and can be represented as a straight line having the following equation:

$$k = 1·2863 - 0·0618\,a$$

where a is the milk acidity in Soxhlet–Henkel degrees (within the range 6·5–10·0 degrees).

Hence $x = (a - 1·11b)(1·286 - 0·062a)$.

The mean deviation of results for casein content obtained by this method from those obtained by the Kjeldahl method was 0·051 per cent; the maximum being 0·115 per cent.

We also investigated the effect of the initiation of protein hydrolysis on our results. Determinations were simultaneously carried out using the Kjeldahl, formol and our methods, before, and several hours after, the introduction of proteolytic bacteria into the milk. The formol method showed an increase of 0·222 per cent in the casein content, whereas with our method the differences from the Kjeldahl method were only 0·007 per cent, and 0·020 per cent. Hence we conclude that slight protein hydrolysis has no decisive influence on the results obtained by our method.

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