

for a 10^{-11} M concentration of one to prevent the inhibition caused by a 10^{-5} M concentration of the other; the third experiment gave an aberrant result.)

The extraordinary mutual antagonism described has in fact always been found (and, with the exception of the single aberrant experiment mentioned, only been found) in experiments with two known chelating agents or with 3-indolylacetic acid and a known chelating agent; the substitution of a non-chelating analogue for one of the agents destroys the symmetry of the interaction or entirely prevents either agent at low concentration from reducing the inhibition caused by a high concentration of the other. The fact that 3-indolylacetic acid interacts with known chelating agents in the same remarkable and symmetrical way as these interact with each other in affecting the growth of roots and of coleoptile sections would seem strongly to support the hypothesis that it is here itself acting as a chelating or complex-forming agent. On this hypothesis, however, there is no reason why 3-indolylacetic acid should interact with the non-chelating 2-hydroxyquinoline in the same way as does ethylenediaminetetra-acetate if the latter interaction is not due to chelation.

Although the biological evidence for chelation or complex-formation by 3-indolylacetic acid appears to us convincing, we have not so far been successful in attempts to obtain direct chemical evidence. The difficulty experienced here may perhaps be due to 3-indolylacetic acid only forming complexes with one or a few metals and (or) within a narrow range of conditions; this might well be biologically advantageous to the plant.

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¹ Heath, O. V. S., and Clark, J. E., *Nature*, 177, 1118 (1956).

Effect of Desiccation on the Dormancy of Barley

IN certain seasons the condition of dormancy in barley is prolonged and the delayed germination of a proportion of the grains has an adverse effect on its use for malting¹. Observations over a number of years have indicated that this condition is more marked when atmospheric humidity is high before harvest. The effect of desiccation has therefore been investigated, as it is also an important factor in the maturation of wheat². During ripening, transfer of material to the endosperm ceases at a moisture content of about 42 per cent, and the grain then undergoes rapid drying³. The final moisture content is

Table 1. EFFECT OF DESICCATION ON PERCENTAGE GERMINATION, (a) DURING RIPENING, AND (b) AT THE HARVEST-RIPE STAGE

Moisture content (per cent fresh weight)	Percentage germination	
	After 10 days at 16°-18° C.	After 3 days at 40° C. and 7 days at 16°-18° C.
(a) 40-45	6	95
29-35	10	94
16-20	44	96
(b) 17.4	44	99
18.1	72	99
16.9	82	100
12.7	99	—

Table 2. EFFECT OF PRE-DRYING AFTER HARVEST ON THE PERCENTAGE GERMINATION

Treatment	0-10	No. of samples grouped according to percentage germination									
		11-20	21-30	31-40	41-50	51-60	61-70	71-80	81-90	91-100	
10 days at 16°-18° C. and 3 days at 40° C.	—	1	2	3	17	10	8	10	11	—	
7 days at 16°-18° C.	—	—	—	—	—	—	—	1	4	57	

determined, however, by the atmospheric humidity and the degree of desiccation therefore depends on the weather conditions before harvest.

The percentage germination was determined at intervals during the final stages of ripening by removing undamaged grains from the ear and placing them either directly in damp sterile sand, at 16°-18° C. for ten days, or after pre-drying for three days at 40° C., which reduced the moisture content to 7 per cent.

The effects of natural and artificial desiccation are shown in Table 1. About half the grains acquired ability to germinate as soon as the moisture content fell during ripening from 40 to 16 per cent, and the majority of the remainder did so later without any further desiccation. Complete germination did not, however, take place until atmospheric conditions allowed the moisture content to fall to 12.7 per cent, although it was obtained after pre-drying at each stage. Full maturity was thus eventually attained by natural desiccation, and although individual grains differed in their response to the same degree of desiccation at the harvest-ripe stage, these differences were removed by additional desiccation. There was no evidence that the dormant condition developed at the time of harvest, as suggested by Bishop⁴.

When the dormant condition persists after harvest, it can also be successfully eliminated by additional desiccation. This is shown, in Table 2, by the increased germination after pre-drying obtained with sixty-two samples of commercial malting barley tested between August and October 1954.

It therefore appears that a varying proportion of grains may fail to reach maturity because of insufficient desiccation before harvest; but this can be corrected by artificial drying during subsequent storage.

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¹ Bishop, L. R., *J. Inst. Brew.*, 53, 86 (1947).

² Wellington, P. S., *Ann. Bot.*, N.S., 20, 105 (1956).

³ Harlan, A. V., and Pope, M. N., *J. Agric. Res.*, 23, 334 (1923).

⁴ Bishop, L. R., *J. Inst. Brew.*, 50, 166 (1944).

An Instance of Delayed Communication in Solitary Wasps

THE eumenid *Rygichium foraminatum* (de Saussure) and the sphecid *Trypoxylon clavatum* Say are common solitary hunting wasps which nest in hollow twigs, making the burrows septate with cross-walls of mortar so that a linear chain of cells is formed. Each brood cell, when first made, contains a single egg along with paralysed prey sufficient for full growth of the young hatched larva to the adult wasp. Generally the provisioned cell is only somewhat larger than the wasp which will mature within it, and indeed may be too small in diameter to permit the adult wasp, once formed, to reverse its direction within it. The oldest wasp larva of necessity lies innermost at the blind end of the burrow, while the youngest occupies the cell nearest the sole exit from the nest. When