to the stem of young bean plants. Such treatment generally gives a marked reduction in the incidence of disease on leaves situated higher up the plant, more particularly in the region of the main veins.

Since these initial experiments were made, this compound has been field tested on blister blight of tea (*Exobasidium vexans*) and coffee rust (*Hemileia vastatrix*) in southern India, and on bean rust (*U. phaseoli*) in East Africa, with encouraging results.

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Blueness of Flowers of *Lathyrus* Hybrids

A STUDY of anthocyanin-pigmented flowers of species of the genus *Lathyrus* revealed a correlation between blueness of petals and the presence of the flavonols quercetin and kaempferol¹. It was suggested that these substances (which may be present as glycosides²) acted as co-pigments which modified the colour towards blue. In this communication evidence is presented from a study of the flowers of interspecific hybrids between the species of the section *Clymenum*³ which supports the above view. Three interspecific crosses yielded limited numbers of fully developed viable seeds, namely: *L. articulatus* L. × *L. clymenum* L., *L. articulatus* × *L. ochrus* DC. and *L. clymenum* × *L. ochrus*^{4,5}.

Table 1. OCCURRENCE OF ANTHOCYANIDINS AND FLAVONOLS IN RELATION TO FLOWER COLOUR

Species	Colour	Anthocyanidins					Flavonols	
		D	P	M	Q	K		
<i>L. articulatus</i>	S red	+	+	+	—	—		
	W white	—	—	—	+	+		
<i>L. clymenum</i>	S red	+	+	+	—	—		
	W blue	—	—	—	+	+		
<i>L. ochrus</i>	S cream	—	—	—	+	+		
	W cream	—	—	—	+	+		
<i>L. articulatus</i> × <i>L. clymenum</i>	S red	+	+	+	—	—		
	W blue	—	—	—	+	+		
<i>L. articulatus</i> × <i>L. ochrus</i>	S mauve	+	+	+	+	+		
	W cream	—	—	—	+	+		
<i>L. clymenum</i> × <i>L. ochrus</i>	S mauve	+	+	+	+	+		
	W blue	—	—	—	+	+		

D, delphinidin; P, petunidin; M, malvidin; Q, quercetin; K, kaempferol; S, standard, and W, wing petals; +, presence; —, absence. Where more than one anthocyanidin was found, the predominant substance is indicated by +*.

Hydrolysed extracts of standard and wing petals of the species and hybrids were prepared and examined by filter-paper chromatography as already described¹. The standard petals of *L. articulatus* and *L. clymenum* were red and the hydrolysed extracts contained anthocyanidins but no flavonols, while those of *L. ochrus* were cream and the extract contained flavonols but no anthocyanidins (Table 1). As would be expected, the standard of *L. articulatus* × *L. clymenum* was red and its extract contained only anthocyanidins. However, the other two hybrids had mauve-coloured standards and the extracts contained both anthocyanidins and the flavonols (Table 1). The wing petal extracts of only *L. clymenum*, *L. articulatus* × *L. clymenum* and *L. clymenum* × *L. ochrus* contained an anthocyanidin. In each instance the flavonols were also present and the petals were blue.

The results presented here are considered important since they strongly suggest that, in the flowers of the experimentally produced hybrids, the presence of flavonols modifies the anthocyanin coloration towards blue. Confirmation is therefore provided for the view that in *Lathyrus* the principal factor concerned

in promoting blueness in anthocyanin-pigmented petals is the presence of flavonols.

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¹ Pecket, R. C., *New Phytol.*, **59**, 138 (1960).

² Harborne, J. B., *Nature*, **187**, 240 (1960).

³ Ascherson, P., and Graebner, P., *Synopsis der mitteleuropäischen Flora* (1906–10).

⁴ Davies, A. J. S., *Nature*, **180**, 612 (1957).

⁵ Selim, A. R. A. A., Ph.D. thesis, University of Manchester.

Abnormal Breeding Behaviour in the Oyster

NORMALLY the gonads of the European flat oyster (*Ostrea edulis*) show signs of development from the early spring onwards, but oysters in the advanced breeding condition or 'black sick' are not generally found until the water temperature reaches 16.0° C. The liberation of larvæ occurs during the summer months, usually at a minimum water temperature of 18° C., and larvæ are rarely found in the water after mid-September.

An unusual occurrence concerning *Ostrea edulis* was reported twice during the week November 27–December 2, 1961. When opened, two oysters were found to be in the 'black sick' condition, with actively swimming larvæ developed to the stage normally found just prior to their release. In one case the oyster was dredged from a bed near the mouth of the River Crouch in Essex, opened on the dredger and later brought to the laboratory for examination. It is possible that the other, opened in London a few days earlier, was from the same locality.

The oyster examined in the laboratory had a mean diameter of 74 mm. and contained an estimated 577,000 larvæ, a typical number for an individual of this size.

Although many thousands of oysters have been removed and sold annually from this area, there are no known records of 'black sick' oysters being taken after the end of October. At this time of year the water temperature in the River Crouch is normally between 9° and 12° C. In a discussion on the incubation period of oyster larvæ in relation to temperature, Korringa¹ quotes incubation periods between 18 days at 13°–14° C. and 6–8 days at 23° C.

During 1961 the mean daily water temperature in the River Crouch was about average and only exceeded 18° C. between June 24 and July 13, with the highest mean of 20.7° C. occurring on July 2. By September 29, the mean daily temperature had fallen below the normal spawning temperature of 16° C. On November 1, it was only 9° C., and by the end of that month had fallen to 5.5° C.

These reports suggest that breeding could have taken place at unusually low temperatures although, without self-fertilization, this would have meant the presence of large numbers of sperm in the water. Alternatively, if spawning took place at normal temperatures the larvæ must have been retained for an exceptionally long incubation period.

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¹ Korringa, P., *Arkiv. Neerl. Zool.*, **5**, 74 (1941).