Discussion. The U/C ratio changes at 2 and 8 h might be related to a high proportion of hybridizable RNA molecules in the brain with short half-lives (2.5–4 h)[10]; such molecules may facilitate adaptations to changes in physiological conditions by an alteration in protein synthesis[11]. Changes in ribosomal and tRNA[12] could also contribute to any alterations in RNA species. The early changes observed during learning are difficult to interpret in terms of information storage and may well represent non-specific changes associated with the onset of a challenging learning task such as arousal.

Consolidation of long term memory by an alteration of synaptic transmission, changes in glial activity or post-synaptic receptor modification might involve the synthesis of new or increased levels of exiting proteins. This would require an increase in transcription and translation and in possible changes in cytoplasmic RNA species and would help to explain changes in the U/C ratio observed on completion of the learning task. Having shown that a neurochemical correlate of learning is time dependent, a non-disruptive approach together with the measurement of the exact half-lives, locations, and specificity of any such neurochemical correlates may prove profitable to a sequential analysis of memory.

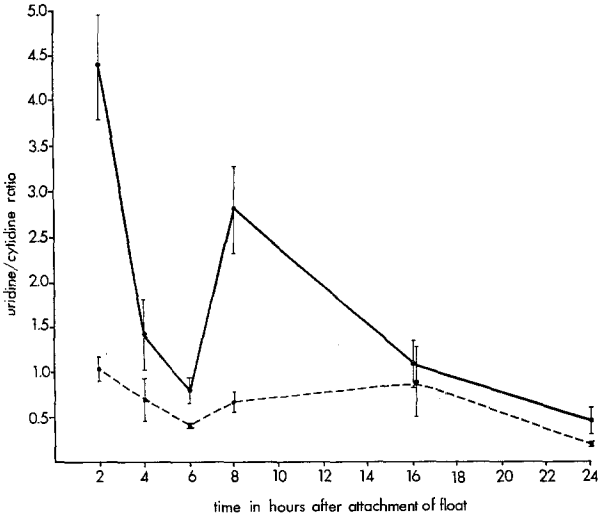

Fig. 2. Time course of an index of base composition (uridine/cytidine ratio) during (0–4 h) and after (4–24 h) the learning task. In each case the label was injected 4h before measurement. Solid line, experimentals; interrupted line, controls. For each point, $n = 5$ (where $n = 1$, 4 brains are pooled); values are given as means $\pm$ S.E.M.

Zusammenfassung. Veränderungen am neurochemischen Korrelat des Erinnerungs- und Lernvermögens im Fisch erwiesen sich als zeitabhängig.

C. J. WOOLF, G. H. WILLIES, H. R. HEPBURN and C. ROSENDORFF[13]

Department of Physiology, University of the Witwatersrand Medical School, Hospital Street, Johannesburg (South Africa), 19 November 1973.

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Phosphorus Metabolism in Grape Buds During Floral Initiation

The importance of P nutrition in grape production has been emphasized by many workers[1–3]. It has been reported that application of P fertilizers at the time of floral initiation and differentiation enhanced the number of fertile buds[4] with accelerated accumulation of P[5,6]. It has also been observed that there was a tremendous upsurge in the nucleic acid P during floral initiation and differentiation[1]. The present study was undertaken with a view to investigating the incorporation of soil applied P into various phosphorus compounds in the buds of vigorously growing Anab-e-Shahi (AS) and less vigorous Bangalore Blue (BB) Pachadraksha (PD) and Kali Sahebi (KS) grape cultivars, during floral initiation.

Radioactive phosphorus in the form of 'carrier free' *ortho*-phosphoric acid at 0.5 mCi/plant was injected into the holes in the soil, made around the plants, 5 days before normal time of floral initiation[5]. Bud samples were collected from the current shoots at the time of floral initiation from all cultivars and the phosphorylated compounds were fractioned[7] after removing the dry scales and tomentose hairs. 1 ml in each of the fractions was dried in cupped planchets under infrared lamp and assayed for ^{32}P activity with the aid of Philips GM counter. The mean activity of ^{32}P of all fractions of P are given in the Table.

The results indicated that the incorporation of ^{32}P in the buds was more in vigorously growing AS than in less vigorous cultivars. The high rate of incorporation of ^{32}P in the buds of vigorously growing varieties might be due to the presence of a greater number of large-sized conducting vessels[8] which in turn could have efficiently transported the applied P into the buds.

Among the various fractions of P, the nucleic acid had more activity to an extent of 68 to 79% of total activity with a predominant amount in DNA fraction in AS and KS. This conspicuous increase in the nucleic acid fraction supports findings in vitis[9,10] *Chenopodium album*[11] and

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Distribution of ^{32}P in different phosphorus fractions in grape buds during floral initiation (expressed as CPA $\times 10^3$/g of fresh weight of buds)

Grape cultivars	Acid soluble-*P*	Phospho-protein *P*	Phospho-lipid *P*	DNA-*P*	RNA-*P*	Total nucleic acid-*P*	RNA-*P*/ DNA-*P*	RNA-*P* phospho-protein	Total *P*
Anab-e-Shahi	2.28 (4.57)	6.79 (13.61)	1.49 (2.99)	30.22 (60.56)	9.12 (18.27)	39.34 (78.33)	0.30	1.3	49.90 (100)
Pachadraksha	0.79 (4.29)	3.17 (17.22)	0.70 (3.80)	7.25 (39.40)	6.49 (35.29)	13.74 (74.69)	0.89	2.0	18.40 (100)
Kali Sahbi	2.09 (14.45)	1.10 (7.60)	0.58 (4.01)	9.40 (64.96)	1.30 (8.98)	10.70 (73.94)	0.14	1.1	14.47 (100)
Bangalore Blue	2.83 (22.24)	0.89 (6.98)	0.38 (2.98)	5.58 (43.79)	3.06 (24.01)	8.64 (67.80)	0.54	3.4	12.74 (100)

Figures in parenthesis are percentages of total productivity.

Lolium temulentum[12]. Moreover there is overwhelming evidence to show that the synthesis of DNA, RNA and protein are considerably accelerated during floral initiation[13,14], which is essentially a process of intense mitotic activity and duplication of DNA.

The comparatively low percent of activity in acid soluble P fraction of AS and PD, and a corresponding increase in phosphoprotein, suggest that the inorganic P and free nucleotides (which constitutes acid-soluble P fraction) could have been efficiently utilized for the synthesis of nucleic acids and nucleo protein. A high ratio of RNA-P/Phosphoprotein and a moderate to high RNA-P/DNA-P ratio observed in PD and BB, low ratio in other two cultivars suggest that a high ratio favours high fruitfulness in grapes. The PD and BB are generally more highly fruitful than the other two varieties. Such high RNA and low protein was observed during floral initiation in *Chenopodium album*[11]. Radioactivity in phospholipid fraction was low in all cultivars, as this fraction is generally less in primordial leaves of buds. In grapes, floral initiation become evident only after the development of specific number of leaf primordia in the buds. Such a comparatively high activity in the phospholipid fraction of AS could be accounted for the greater number (5 to 6) of well-developed leaf primorida in this cultivar, whereas in others it is only 2 to 4. Such a linear increase in phospholipid corresponding to the increase in size and number of leaf primordia has been observed in runner bean[15].

It is obvious from the study that the nucleic acid synthesis is a prerequisite for floral initiation, but its intensity and that of other fractions depends on the cultivars. Further, it is evident that the ratio of nucleic acid to other P fractions is more important than their absolute quantity for high fruitfulness in grape buds.

Zusammenfassung. Das Verhältnis von Nukleinsäuren zu anderen phosphathaltigen Fraktionen ist von grösserer Bedeutung für den späteren Fruchtansatz der Weintrauben als ihre absolute Menge in den Knospen.

C. Srinivasan, C. R. Muthukrishnan, A. Shanmugam and C. V. Chellam

Department of Horticulture, Tamil Nadu Agricultural University, Coimbatore-641003 (Tamil Nadu, India), 11 May 1973.

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Zum Nachweis einiger mechanisch-rheologischer Eigenschaften des hyalinen Knorpels

Seinen vielfältigen mechanischen Aufgaben entsprechend verkörpert der hyaline Knorpel eine Reihe mechanischer Eigenschaften. Über die histologische Struktur, Wachstums- und Umbauvorgänge sowie die chemische Zusammensetzung des Knorpels sind viele Einzelheiten bekannt. Dagegen ist sein komplexes mechanisches Verhalten nur in Teilbereichen geklärt. Die mechanischen Grundeigenschaften des Knorpels sind Festigkeit, Viskosität, Elastizität, Turgor, innere Reibung und Diffusibilität. Aus ihrer Kombination resultieren zahlreiche mechanisch-rheologische Eigenschaften, von denen hier Retardation (Kriecherscheinung), Relaxation, elastische Nachwirkung und Kraftrückgewinn (mechanische Erholung, inverse Relaxation) genannt seien. Diese Begriffe stammen zum Teil aus der Rheologie[1] und Mechanik hochpolymerer Körper, beides Teilbereiche der Physik, die massgebliche Grundlagen für gewebsmechanische Untersuchungen in der Biologie darstellen[2–5]. Retardation ist die Deformation eines Körpers in zeitlicher Abhängigkeit unter konstanter Kraft. Untersuchungen über die Retardationserscheinung am Gelenkknorpel stammen von Hayes et al.[6], Kempson et al.[7]

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