deoxyuridine-labelled molecules (f). The rate of chain elongation (L) can be estimated according to the equation $L = B/2f$. To avoid error due to [^{3}H]-thymidine remaining in the precursor pool after addition of bromodeoxyuridine the value of f after ultrasonication (f_u) was subtracted from the value observed after shearing (f_{sh}).

The results show that both the inhibitors exert markedly inhibitory effects on the DNA chain elongation rate (table). The total DNA synthesis seems to be somewhat more inhibited than the DNA chain elongation rate. This can be explained by an inhibition of the initiation of new replicons. Similar results have been obtained with low concentrations of araC in HeLa cells by Friedland[12].

As both araCTP and aphidicolin inhibits DNA polymerase α rather specifically, our results seem to indicate a role of DNA polymerase α in the initiation process at the replicon level. Further evidence is needed, however, to draw definite conclusions.

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Occurrence in mushrooms (Homobasidiomycetes) of cis- and trans-octa-1,5-dien-3-ol, attractants to the cheese mite *Tyrophagus putrescentiae* (Schrank) (Acarina, Acaridae)

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Summary. Cis- and trans-octa-1,5-dien-3-ol were identified in 15 Homobasidiomycetes; these compounds exhibited a significant attraction for the cheese mite *Tyrophagus putrescentiae* (Schrank) (Acarina, Acaridae).

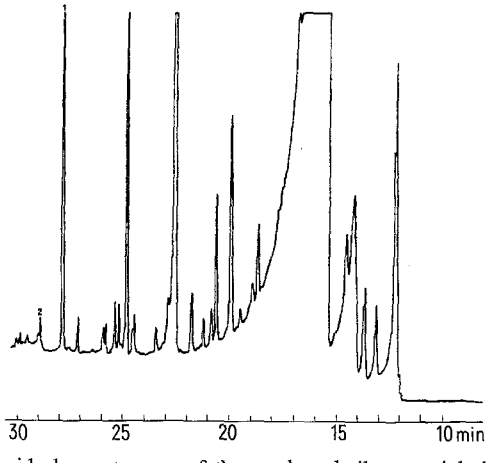
The volatile compounds emitted by *Trichothecium roseum* (Fungi Imperfecti) at a very low concentration have been found strong attractants for *Tyrophagus putrescentiae* (Schrank, 1781) (Acarina, Acaridae). The main attractant constituents of these volatile materials have been identified as cis- and trans-octa-1,5-dien-3-ol[1,2]. Cis-octa-1,5-dien-3-ol has been also isolated from a Rhodophyta[3]. This paper describes the identification of cis- and trans-octa-1,5-dien-3-ol in 15 Homobasidiomycetes.

After collection, the mushrooms were crushed with 1 part of anhydrous sulfate; the volatile materials were removed from this mixture at room temperature, for 72 h, by a nitrogen flow and preconcentrated on Tenax GC®. In these conditions of trapping, the isolated volatiles are qualitatively and quantitatively representative of the original odor produced by the mushrooms[4].

After the preconcentration step, the volatile materials trapped on Tenax were directly injected on to the head of the gas-liquid chromatography (GLC) columns by means of an external flash vaporizer inlet and separated either on an FFAP 100 m × 0.5 mm inner diameter glass capillary column (analytical studies) or on a packed column (10% carbowax 20 M on chromosorb W HP 80–100 mesh (preparative studies)).

Cis- and trans-octa-1,5-dien-3-ol were identified (co-injections with authentic samples, analytical data from GLC/MS studies) and their relative concentrations were further expressed as a fraction of the total volatile components emitted by the mushrooms (table).

There was no relationship between the concentration of the octadienols and oct-1-en-3-ol which was also identified in the chromatograms (table); thus the higher concentration of octadienols was found in *Lepiota seminuda* and the lower in *Gymnopilus spectabilis*. An example of chromatogram of the GLC separation of a mushroom crude extract is given in the figure. As previously reported for 7 other mushroom species[5], the main volatiles found in the investigated species have 8 carbon atoms. Octadienols present a strong 'mushroom-like' odor and thus contribute to the general odor produced by the mushrooms.



Gas-liquid chromatogram of the crude volatile materials isolated from *Clitocybe nebularis*. Chromatographic conditions: liquid phase FFAP 100 m × 0.5 mm inner diameter glass capillary column; helium flow rate: 3 ml/min; oven temperature: 65–190 °C at 2.5 °C/min for 6 min then 5 °C/min and finally isothermal; injector and detector temperature: 295 °C. 1. Oct-1-en-3-ol; 2. cis- and trans-octa-1,5-dien-3-ol.

Relative proportions of cis- and trans-octa-1,5-dien-3-ol and of oct-1-en-3-ol in the total volatiles produced by 15 Homobasidiomycetes

	Proportion of oct-1-en-3-ol (%)	Proportion of cis- and trans-octa-1,5-dien-3-ol (%)
Boletus carpini (Schulzer)	0.93	0.40
Clitocybe nebularis (Batsch ex Fr.)	1.41	0.17
Coprinus atramentarius (Bull. ex Fr.)	2.87	0.30
Coprinus comatus (Mull. ex Fr.)	13.07	0.48
Drosophila candolleana (Fr.) Quélet	0.75	0.22
Drosophila hydrophila (Bull. ex Fr.) Quélet	9.19	0.52
Dryophila lenta (Pers. ex Fr.) Quélet	22.40	0.15
Dryophila squarrosa (Pers. ex Fr.) Quélet	8.45	0.36
Gymnopilus spectabilis (Fr.) Singer	17.82	<0.01
Lactarius vellerius Fr.	3.44	0.66
Lepiota acutesquamosa (Weinm.) Gillet	8.61	0.13
Lepiota seminuda	11.10	4.40
Melanoleuca cognata	19.92	0.15
Mycena pura (Pers. ex Fr.)	1.36	0.63
Phylacteria terrestris (Ehr. ex Fr. Pat.)	0.40	0.05

Furthermore, octadienols isolated by preparative GLC from the mushrooms were investigated for their attraction potency for the cheese mite, *Tyrophagus putrescentiae* (Schrank) (Acarina, Acaridae). The bioassay (cross test) was carried out following the method of Yoshizawa et al.[6] and calculations following Geeraerts[7].

A significant attraction quotient was found for dilutions of volatile materials equivalent to quantities as lower than 100 mg of *Coprinus atramentarius*. As previously assumed, octa-1,5-dien-3-ols were fairly widespread and evidently implicated in the relation between Acaridae and Fungi.

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Absence of recovery in the dark of chloroplast formation in UV-irradiated *Euglena*

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Summary. UV-irradiated *Euglena* showed recovery of liquid holding, as indicated by cell survival, but not of chloroplast formation. The addition of caffeine after UV-irradiation decreased the fraction of cells surviving, but had no effect on the chloroplast formation.

UV-light is known to be one of the agents which produces irreversibly bleached progeny in *Euglena*. When cells are exposed to weak UV-light, the fraction of bleached cells in the population increases. On the other hand, much higher UV-doses are required for a loss of cell-viability. Some considerations may help to suggest the cause of the above mentioned difference; for example, the chloroplast provides a smaller UV-target than the nucleus, and nuclear ploidy may have some effect. On the other hand, mechanisms for the excision-repair of DNA are absent both from the nucleus and from the chloroplast of *Chlamydomonas reinhardii*[1,2]. Excision of UV-induced pyrimidine dimers also seems not to occur in Tobacco, *Haplopappus*[3] and *Ginkgo*[4]. The ability to carry out photo-repair is said to exist in *Chlamydomonas* and in these plants[3-5]. In *Euglena*, also chloroplast formation can be fully photoreactivated after damage by UV[6].

To compare the ability for dark repair in the chloroplast with that in the nucleus seemed to be one way to explore the phenomenon of easy bleaching of *Euglena* by UV. For this purpose, we tried in *Euglena* to observe the activity of liquid holding recovery (LHR) as detected in *Escherichia coli* by the appearance of an increased number of surviving colonies[7]. We also studied repair inhibition by caffeine (CAF) as was detected in the bacteria by a decrease in the number of surviving colonies[8,9]. Cells of *Euglena gracilis* strain Z were cultured at 25 °C in a modified Hutner's medium. Continuous illumination was supplied by a fluorescent lamp, about 2000 lux at the surface of the culture. Cells in the early stationary phase were harvested and starved in M/25 KH_2PO_4 solution in the light for 3 days. During the incubation, neither cell growth nor loss of viability was observed. As a UV-source, a 15 W or 6 W germicidal lamp from Toshiba Electric Co. located 2.3 m above the sample cell suspension was used. Strong UV-

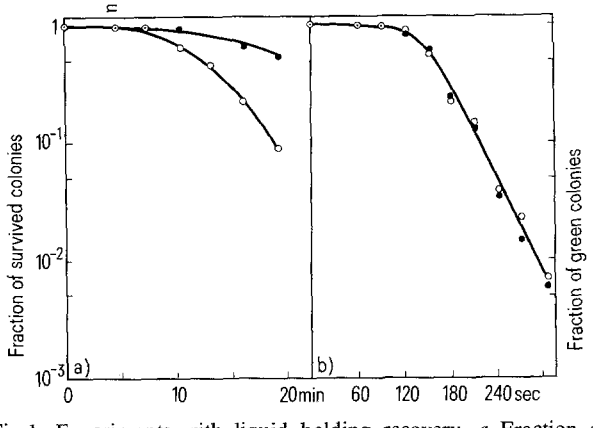

Fig. 1. Experiments with liquid holding recovery. *a* Fraction of surviving colonies (15 W germicidal lamp) *b* fraction of green colonies (6 W germicidal lamp). O Cells were plated immediately after UV-irradiation; ● UV-irradiated cells were held in M/25 KH_2PO_4 solution for 4 days and then plated.