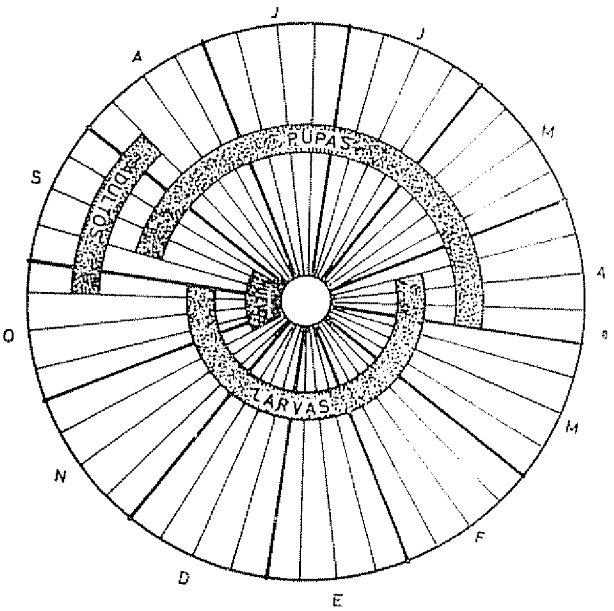

Fig 4 —*Ciclo estacional de* Opostega

Aun cuando aparentemente hay una alta mortalidad natural entre los estados de desarrollo, especialmente durante el estado de huevo, no se encontró incidencia de parasitismo o predación en ésta

Resumen

Uno de los principales defectos del coigüe, *Nothofagus dombeyi*, es el comúnmente llamado "mancha roja" Este daño es ocasionado por el minador del cambium *Opostega* sp (Lep: Opostegidae).

Se estudió en la provincia de Valdivia, Chile, su ciclo estacional, observándose que los huevos son puestos en la primavera en las hojas, las larvas barrenan en el cambium del árbol durante todo el verano y parte del otoño, saliendo a través de la corteza a mediados de esta última estación, para pupar en la hojarasca sobre el suelo e invernar durante este estado, emergiendo los adultos en los comienzos de primavera

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Ethylene-induced changes in the chemical composition of coffee mucilage

Sumario. La aplicación exógena de etileno (360 ppm) a los frutos en desarrollo de café Robusta dio lugar a cambios significativos de composición en el mesocarpo Las tendencias obtenidas con proteínas. carbohidratos. pectinas y polifenoles han sido discutidas en relación con la maduración del fruto y su importancia en la utilización de productos de desecho en el café

Besides its impact on ripening, ethylene has been shown to block the accumulation of dry matter in the mesocarp of coffee fruits (20) This portion of coffee fruits, populary called the mucilage, contains a variety of compounds, some of which have great economic importance (18). It would be desirable to investigate if ethylene affects these compounds in any manner. The present work on robusta coffee is an attempt in this direction

Fruit bunches on field grown plants of *Coffea canebhora*, Pierre ex Froehner (Robusta) were given a single treatment of 360 ppm of ethylene (19). Mucilage from fresh fruits was extracted. dried and analysed following the procedures employed proveously (18).

Results and Discussion

Ethylene-induced decrease in the pectic content (Table 1) is consistent with the reported work on coffee fruits (19). Ethylene influences such changes either by promoting the enzymic hydrolysis (10) or inhibiting pectin synthesis through the blockage of endogenous auxins (4, 15). The lowered pectins obtained here must be due to the inhibition of pectin synthesis because endogenous auxins decreased with the natural ripening of coffee fruits (2)

Protein in the mucilage of ethylene-treated fruits remained at significantly higher level. That this increase is achieved by fresh synthesis receives support from observations involving increase in gross protein content, including the enzymic one (4, 6), use of inhibitors of protein synthesis (3, 8, 11) and labelled amino acids

Table 1 —Chemical analysis of mucilage in control and ethylene-treated coffee fruits.
(Mean of 5 replications with SE).

	Control	Treated
Pectins	29 74 ± 2 36	25 25 ± 085
Proteins	9 13 ± 0.16	13 76 ± 0 20
Reducing sugars	8 99 ± 0 45	7,61 ± 0.75
Non-reducing sugars	15 52 ± 3 48	22 80 ± 4.70
Starch	11.08 ± 0.80	9 59 ± 0 66
Polyphenols	0 33 ± 0 03	0.24 ± 0.01
Ash	5 84 ± 0 26	5 59 ± 0.31
Residue*	19 38	15 16

* Includes unestimated compounds also.

(3, 8, 12). Sacher and Salminen (16) on the other hand, failed to notice any increase in protein synthesis when preclimacteric bananas and avocadoes were treated with ethylene.

Tthylene-treated fruits in this investigation ad low levels of polyphenols This might have resulted from higher oxidation because ethylene stimulates the activity of polyphenol oxidase (17).

The low starch and high soluble sugars observed in the treated fruits of coffee suggest that the carbohydrate reserves of ripening fruits register a shift from starches to sugars (14). The present results are also supported by the work of Jones (9) who noticed a stimulation of amylase excretion in the ethylene— incubated aleurone cells of barley. The low level of reducing sugars might have occurred as a result of their rapid utilization in respiration (1) because both natural and ethyleny-induced ripenings requiere expenditure of energy by oxidative phosphorylation (13) This draws its support from the high rates of respiration recorded in ethylene treated fruits (6) and ripening arabica berries (5).

Fruit ripening, irrespective of its achievement through natural or exogenously applied ethylene, is a developmental event involving transcription and translation (14) It is thought that ethylene triggers ribosomal amd messenger RNA to effect enhanced protein synthesis, including enzymes (7) This necessitates a continuous supply of amino acids Amino acids of the cellular pool may not be adequate and fresh synthesis from keto acids of krebs cycle becomes necessary To augment this high demand of keto acids for a steady rise in respiration (6) and consequently drain-away the reducing sugars (1) In this light, the observed findings of enhanced protein synthesis and lowered reducing sugars apper meaningful.

Another interesting feature of this investigation is that ethylene, which blocks the mesocarp growth (20), would not exert its influence by adversely affecting the economically important constituents like proteins, pectins and minerals The utility of coffee mucilage as a source of pectins, cattle-feed and organic manure, therefore, remains more or less the same Ethylene in fact improved the protein content by about 51%, thus enhancing its usage as a cattle feed and organic manure. This observation appears to be highly important in view of the current trent of using ethylene to hasten the ripening of coffee fruits.

Abstract

Exogenous application of ethylene (360 ppm) to the developing fruits of Robusta coffee brought about significant compositional changes in the mesocarp The trends obtained with proteins, carbohydrates, pectins and polyphenols have been discussed with reference to fruit ripening and its bearing on the utilization of waste products of coffee.

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Contaminación con arsénico, paralela a la alcalinización y salinización de suelos, provocada por el agua de riego

Abstract. In an irrigated area with poor quality water (C_3S_4) and high arsenic content, a soil enrichment with arsenic was found along with alkalinization and incipient salinization The contamination was originated by the irrigation water, since there are no other sources of contamination The soluble arsenic content ranges up to toxic levels

We suggest that this hazard be taken into account in other cases of irrigation with high arsenic content

Desde el punto de vista químico y físico-químico, las aguas de riego provocan importantes cambios en el suelo. En algunos casos originan ganancias y en otros pérdidas

Los aportes más importantes son los de sales solubles o sodio intercambiable (11) Entre los elementos tóxicos para los vegetales, los enriquecimientos más conocidos son los de boro (11) y en menos medida de litio (1).

En el presente se comunica un proceso de enriquecimiento de arsénico en el suelo, debido al alto contenido de este elemento en el agua de riego.

En el área no se utilizaron plaguicidas arsenicales, las principales vías de contaminación (3; 5; 6; 8; 10; 13;) y se encuentra muy alejada de centros industriales o mineros, que pueden ser otra fuente de contaminación (7; 12).

Las aguas de riego obtenidas por bombeo a partir de la segunda napa, son ricas naturalmente en arsénico, como ocurre comúnmente en La Pampa (2).

Materiales y métodos

El área estudiada se encuentra en Winifreda (Provincia de La Pampa) en la región Semiárida Pampera (unos 650 mm de lluvia anual) trabajándose en una superficie donde se practica riego complementario

Los suelos son haplustoles énticos, de escaso desarrollo de horizontes Para el presente se tomaron muestras con barreno hasta 1,20 metros de profundidad, con intervalos de 0,30. Se efectuaron cinco extracciones en el área irrigada (área A) y cinco fuera de ella (área B).

A las muestras de suelo, se les determinó pH en pasta, conductividad eléctrica en extracto de saturación, porcentaje de sodio intercambiable a partir de la RAS del extracto de saturación, materia orgánica (Walkley & Black), textura (método de la pipeta) y calcáreo, cualitativamente (11) (Cuadro 2).

A las muestras de agua de riego, se le determinó pH, conductividad eléctrica y aniones y cationes solubles (11) (Cuadro 1).

El arsénico del suelo se extrajo en la forma a) soluble en agua, a través de un extracto acuoso 1:10 con posterior destrucción de materia orgánica con ácidos sulfúrico y nítrico, y b) total, mediante digestión con ácidos sulfúrico, nítrico y perclórico (4)

La determinación del arsénico se efectuó, en los extractos de suelos y agua, con el método de la arsina - azul de molibdeno (4)

Cuadro 1.—Características del agua de riego

Ca	Mg	Na	K	CO_3H	CO_3	Cl	SO_4
0,54	0,74	17,17	0,43	16,39	0,60	0,37	1,14

CE mmho /cm	pH	RAS	(a) CSR	(b) Caracterización	As ppm
1,62	8,6	21,46	15,71	C_3S_4	0,32

(a) Carbonato de sodio residual.
(b) Según US Salinity Laboratory (11)