STUDY OF ASSIMILATORY PIGMENTS FROM APPLE TREE LEAVES

STUDIUL PIGMENȚILOR ASIMILATORI DIN FRUNZELE DE MĂR

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Abstract. *In this paper are presented results of determination of assimilation pigments in apple leaves, in seasonal dynamic. We also calculated the correlation between rate of photosynthesis and chlorophyll a and b. The researches were carried out at I.C.D.P. Pitesti-Maracineni between 2001-2005, with the following types of apple trees Idared, Golden Delicious and Jonathan.*

Rezumat. *În lucrarea noastră sunt prezentate rezultate ale determinării cantității de pigmenți asimilatori din frunze, în dinamică sezonieră. Am calculat corelațiile dintre intensitatea fotosintezei şi cantitatea de clorofilă a şi b. Cercetările au fost efectuate la ICDP Pitesti Mărăcineni între anii 2001-2006, al următoarele soiuri de măr: Idared, Golden Delicious şi Jonathan.*

The chlorophyll content in leaves and intensity of photosynthesis wasn't correlated in all described cases in profile literature. Hoza (1995) observed to plums, Stanley cultivar, a positive correlation for these parameters (r=0,84). The chlorophyll content in leaves differ with phenophase, specie, cultivar, intensity of the light etc (Burzo et all, 1999). Dynamic determinations to vegetative period show that the high value of chlorophyll content is in end of growth leaf period. Hoza's researches (1995) specify the high chlorophyll content from plums tree is in the middle of July: 295,69 mg/100 g fresh weight, to Stanley cultivar.

To plum tree, Paul-Badescu (1996) shows that dynamics of assimilatory pigments record in interval May-beginning of the June a great rise, the chlorophyll a and b content doubling, after that moment these values are bee-keeper for entire summer until beginning of September. The carotenoids pigments generally present a parallel dynamic with green pigments, but with smaller values.

MATERIAL AND METHODS

Physiological researches have taken to I.C.D.P. Piteşti-Mărăcineni between 2001-2006 with following types of apple trees Idared, Golden Delicious and Jonathan. The investigations of chlorophyll and carotenoids pigments were performed spectrophotometrically, in 80% acetone, to 663 nm, 645 nm and 440 nm wavelength. The results are expressed in mg/g dry matter. The statistic interpretation was made with SPSS 13,0 for Windows programme. We used Duncan test for variance analyse and Pearson correlation coefficient for establish the correlation between rate of photosynthesis and chlorophyll content.

RESULTS AND DISCUSSIONS

In figure 1 are represented seasonal dynamic of assimilatory pigments to Idared, Golden Delicious and Jonathan apple cultivars. In July registered the higher value of chlorophyll a content for all apple cultivars. The quantity of chlorophyll b vary between 1,2 mg/g d.m. in August and 1,5 mg/g d.m. in September. The carotenoid pigments present following seasonal dynamic: the value increase in July, and next months the quantity of carotenoid pigments is all around the same mean value.

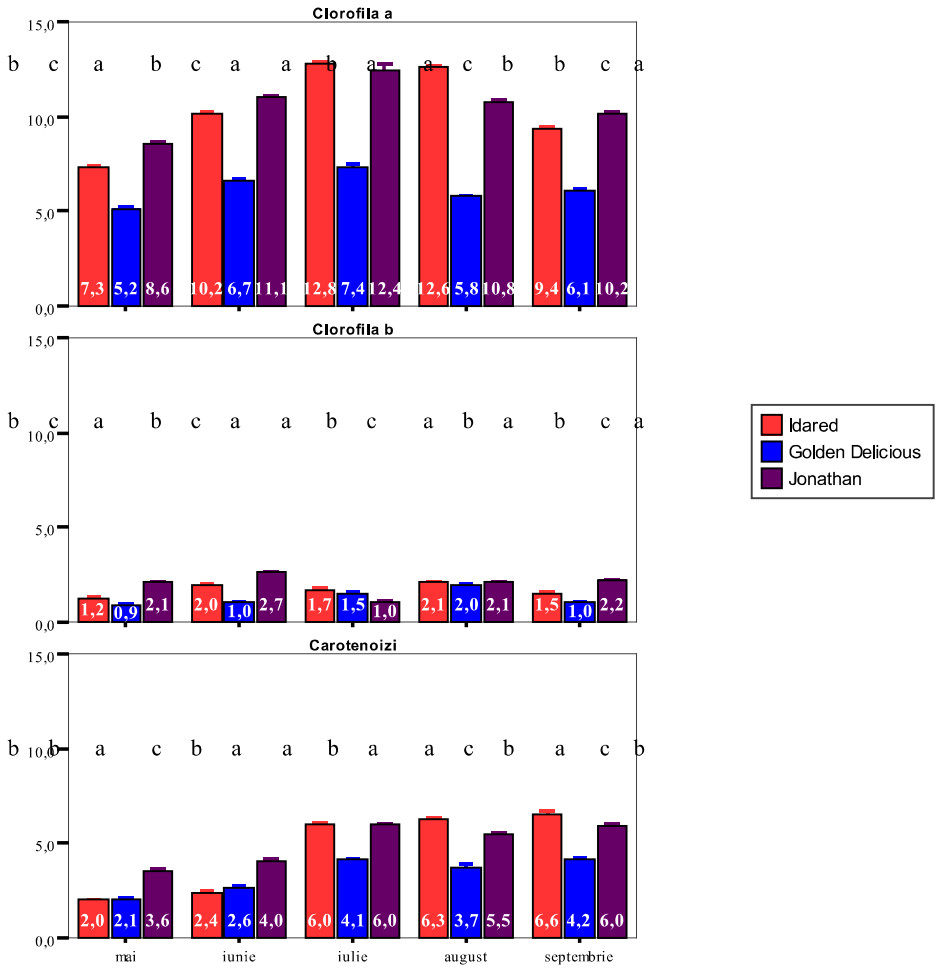

Fig. 1. Determination of assimilatory pigments from leaves (mg/g d.m.) to Idared, Goden Delicious and Jonathan apple cultivars

In figure 2, 3 and 4 are represented correlation coefficients, trendline and the equation for these lines between rate of photosynthesis and quantity of pigments.

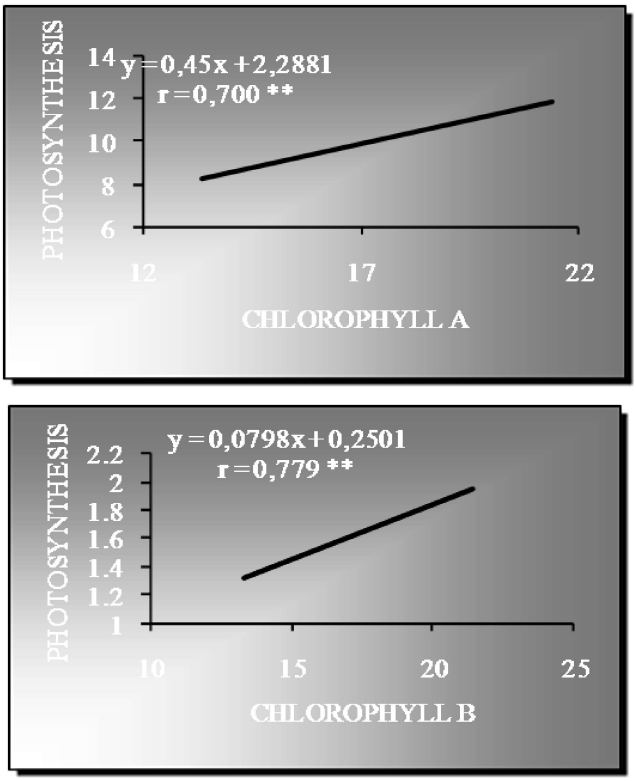

Fig. 2. Correlation between rate of photosynthesis and quantity of chlorophyll a and b to Idared apple cultivar (**. Correlation is significant for p<0,01)

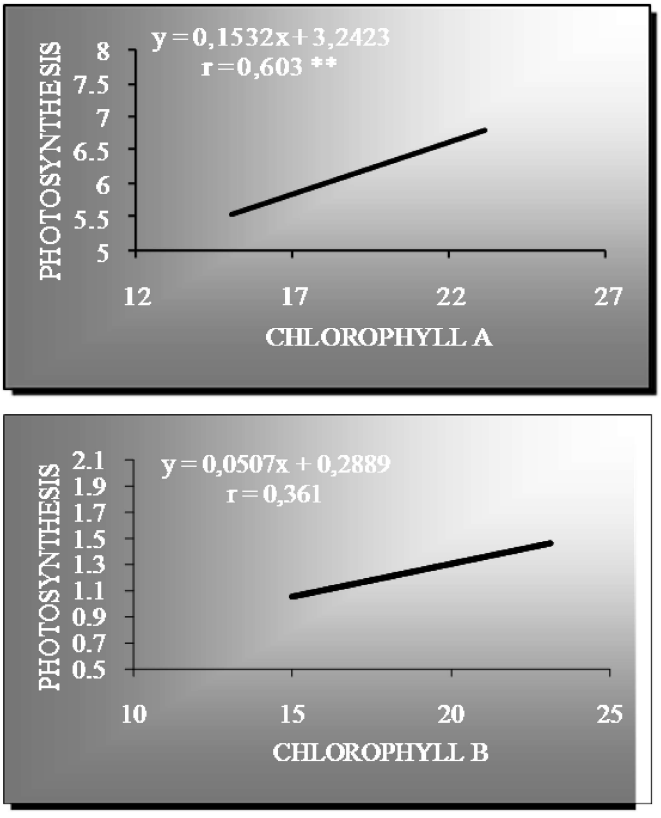

Fig. 3. Correlation between rate of photosynthesis and quantity of chlorophyll a and b to Golden Delicious apple cultivar (**. Correlation is significant for p<0,01)

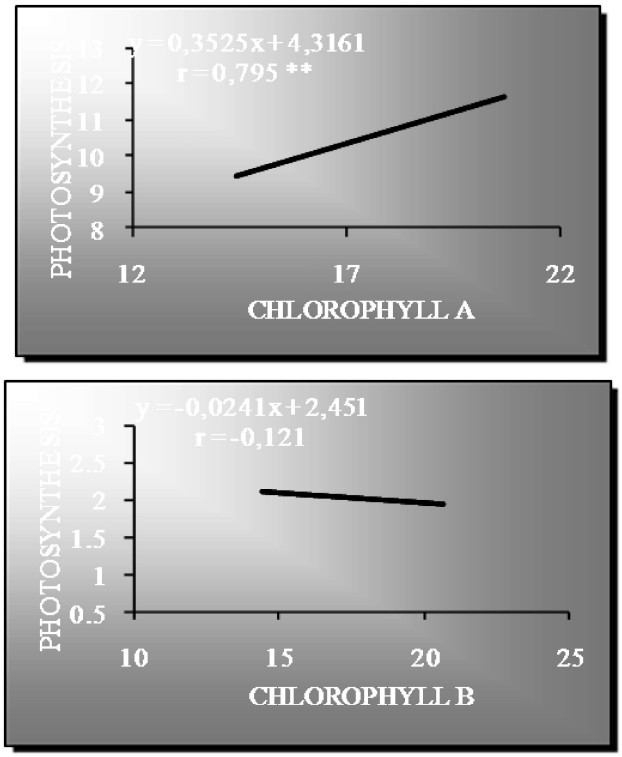

Fig. 4. Correlation between rate of photosynthesis and quantity of chlorophyll a and b to Jonathan apple cultivar (**. Correlation is significant for p<0,01)

CONCLUSIONS

The major value for chlorophyll a content registered in July; the quantity of chlorophyll b increase in spring, became maxim in summer months and these values easily decrease; the carotenoid pigments present following seasonal dynamic: the value increase in July, and next months the quantity of carotenoid pigments are constant.

Between rate of photosynthesis and quantity of chlorophyll are establish positive significant correlations for all apple cultivars; chlorophyll b are significant correlated with photosynthesis only for Idared cultivar.

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