

Background information

- Vegetable amaranth are not only important sources of nutrients, but also rich in health promoting compounds, such as carotenoids.
- However, in the open field, the crop suffers from insect pest and diseases, and unfavourable weather conditions that severely affect its quality, including carotenoids.
- The present study evaluated the effect of net covers on carotenoids in vegetable amaranth (*Amaranthus cruentus* L. cv. Olevolosi) during storage.



Fig. 1. Vegetable amaranth under net covers

Fig. 2. Vegetable amaranth in the open (control)

-Microclimate-

- Net covers helped to conserve soil moisture, improve temperature and increase relative humidity by 33.4%, 30%, and 12.3%, respectively compared to the control (Tab. 1).
- PAR was not affected by use of net covers.

Tab.1. Effect of net covers on microclimate during production of vegetable amaranth.

| Treatment | Soil moisture (%) | Temperature (°C) | Relative humidity (%) | PAR (mmol/m ² /s) |
|----------------|-------------------|------------------|-----------------------|------------------------------|
| Control (Open) | 22b | 20b | 65b | 583a |
| Net cover | 30a | 24a | 73a | 600a |

Means followed by the same letter within a column are not significantly different according to LSD at 5% level of significance.

-Carotenoids-

- Net cover helped to preserve all the studied carotenoids, while control resulted in significant reduction in carotenoids throughout the storage (Fig. 3).

Conclusion

- The effect of net covers on nutritional quality of vegetable amaranth was attributed to microclimate modification (e.g. soil moisture, temperature and relative humidity).
- The findings demonstrate the potential of using net covers in improving and preserving nutritional quality of vegetable amaranth.

Experimental set-up

- The crop was grown for 8 weeks either under net covers (white, 0.9 mm pore size) (Fig. 1) or in the open (control) (Fig. 2), in a randomized complete block design, with three replications.
- Microclimate (soil moisture, temperature, relative humidity and PAR) was monitored throughout the production period.
- After harvest, the leaves from each treatment were kept at room temperature conditions (temperature; 20 ± 3 °C, relative humidity 65 ± 5%) for four days.
- Data were collected at harvest and during storage, at 2-days interval and subjected to analysis of variance and means separated with LSD test, at 5% level of significance.
- Carotenoids (lutein, lycopene and β-carotene) as well as chlorophyll a and b were extracted using acetone-hexane and analyzed using UV-VIS spectrophotometer.

Results

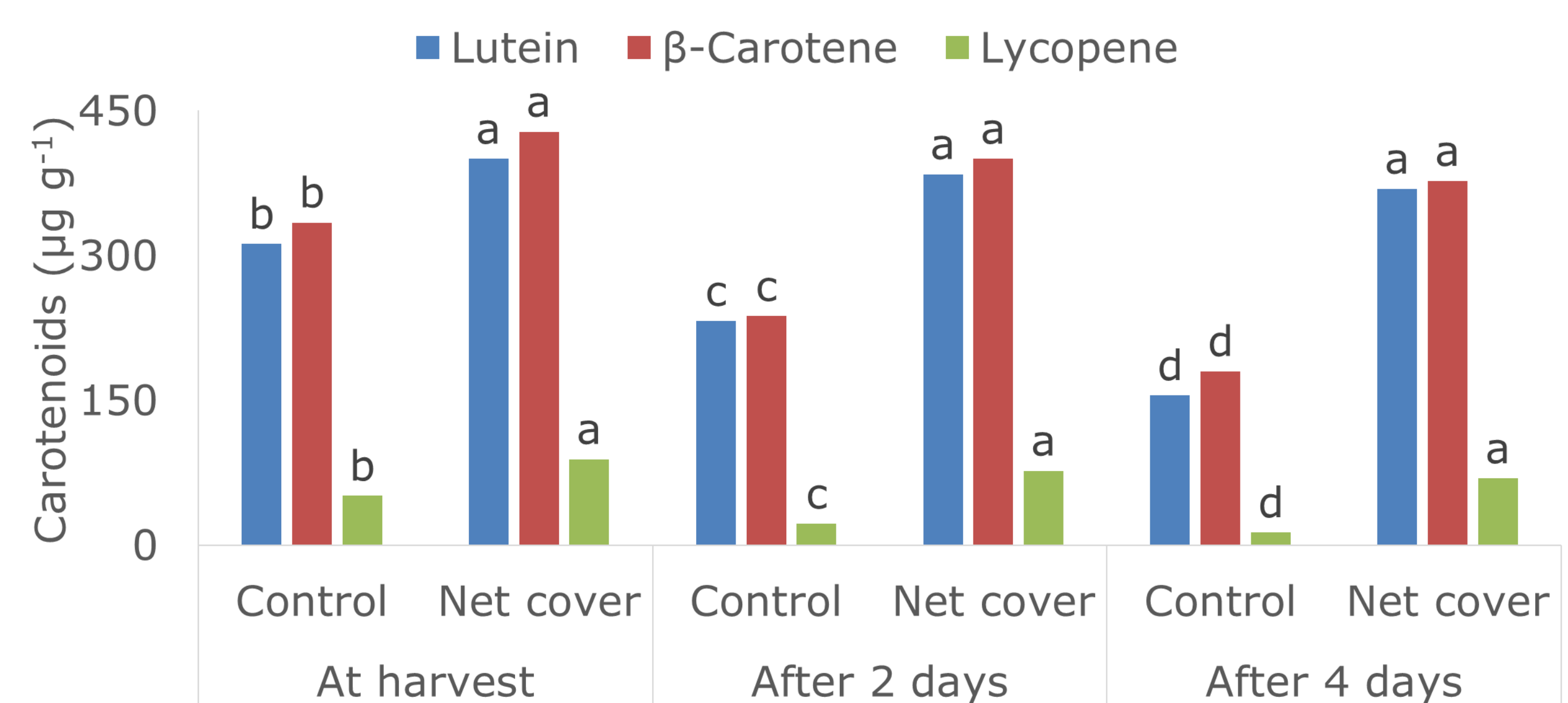


Fig. 3. Effect of net cover on carotenoids content in vegetable amaranth during storage. Means followed by the same letter within a parameter are not significantly different according to LSD at 5% level of significance.

-Chlorophylls-

- Net covers helped to preserve both chlorophylls a and b compared with the control (Fig. 4).
- At harvest, net cover had no effect on chlorophyll a.

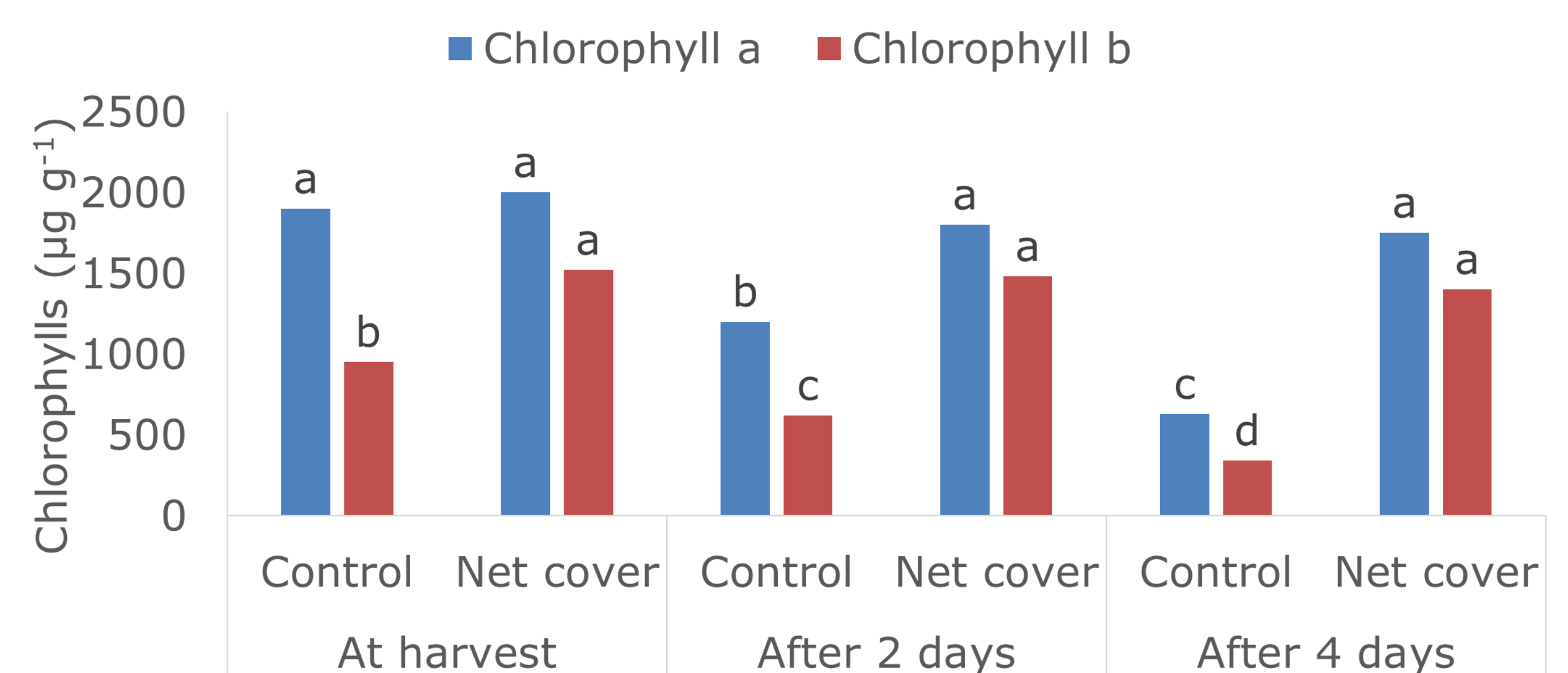


Fig. 4. Effect of net cover on chlorophylls content in vegetable amaranth during storage. Means followed by the same letter within a parameter are not significantly different according to LSD at 5% level of significance.