

Effects of high temperature on plant reproduction and health-promoting qualities of two buckwheat species *Fagopyrum esculentum* and *Fagopyrum tataricum*.

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In the context of ongoing climate change, expected temperature rise may significantly limit plant growth and productivity of crop species. In this study, we investigated the effects of a sub-optimal temperature on buckwheat, a pseudocereal known for its nutraceutical advantages. Two buckwheat species differing by their reproduction method, namely *Fagopyrum esculentum* and *Fagopyrum tataricum* were grown at 21°C and 27°C in growth chambers. High temperature increased leaf production mainly in *F. tataricum* but decreased leaf area in both species. Regarding reproductive stage, high temperature delayed flowering time but boosted inflorescence and flower production. Nevertheless, flower and seed abortion were observed in both species at 27°C. Regarding flower fertility, heat affected more the female stage than the male stage and reduced the stigma receptivity. Pollen production increased with temperature in *F. esculentum* while it decreased in *F. tataricum*. Such discrepancy could be related to the self-incompatibility of *F. esculentum*. Both species increased their antioxidant production under high temperature to limit oxidative stress and antioxidant capacity was higher in the inflorescences than in the leaves. Total flavonoid content was particularly increased in the leaves of *F. esculentum* and in the inflorescences of *F. tataricum*. Altogether, our results showed that even if high temperature may negatively affect reproduction in buckwheat, it improves its antioxidant content.