Changes in photosynthesis and some related processes during source/sink manipulation in young tea (Camellia sinensis L.)

The role of sink and source capacity on productivity in tea (*Camellia sinensis*) is still a subject of debate. Hence the effect of manipulating sink and source capacity on photosynthesis and some selected related processes of young nursery tea was examined.

The treatments given were, increasing and decreasing sink capacity, decreasing source capacity and the control. A separate experiment was carried out by labeling the topmost mature leaf with ^{14}C and detecting the activity. Changes in photosynthetic rate, fluorescence, sugar and starch contents in the uppermost mature leaf were monitored before dawn and dusk for five days.

Increasing sink capacity, increased the rate of photosynthesis and carbohydrate content one-day after the treatment and decreased gradually thereafter. Reduction in sink capacity decreased the photosynthetic rate, which coincided with an increased level of carbohydrates. Decreasing source capacity, decreased photosynthetic rate drastically the day after treatment and increased above other treatments thereafter. There was a corresponding decrease in the carbohydrates, both in sugar and starch contents. The same trends in the cargon assimilation were also observed in the study with ^{14}C.

The study showed that altering sink and source capacity alters photosynthesis and the studied related processes markedly. Photosynthesis in tea is shown to be sink limited. In the absence of mature leaves near developing axillary shoots, other nature leaves can act as sources. The study also confirms that growing shoots act as a major sink for assimilates.