

Comparison of Physiological Activities of the Leaf extract of *Senna tora* by harvest time

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Introduction

Senna tora is an annual crop belongs to the Fabaceae family. According to the Korean Food Code, leaves and seeds of *S. tora* can be used as food ingredients. The aim of this study is to uncover the potential value in use of *S. tora* leaves. To do that, physicochemical properties together with antioxidant capacity of *S. tora* leaves were examined according to harvest timing.

Materials and Methods

S. tora seeds were stored at -20°C, sown in trays, and grown for 6 weeks. Thereafter they were transplanted into a field with vinyl mulching, spaced at 30x30 intervals in Eumseong, Chungbuk. Harvesting took place once a month from early June to September, and extraction was carried out using 70% ethanol. Total polyphenol contents, total flavonoid contents and the radical scavenging activity of DPPH and ABTS were investigated for analysis the antioxidant activities.

Results

The leaf yield per plant exhibited monthly variations, with 6g in June, 139g in July, 152g in September and reaching its peak at 213g in August. Likewise, sample from August showed to posses the highest polyphenol and flavonoid contents as 125.34±1.66 mg GAE/g and 104.69±0.42 mg CE/g, respectively. Result of *S. tora* monthly leaf extract antioxidant experiment IC₅₀ was lowest in DPPH in Aug at 110.94±1.19µg/ml, ABTS was Sep at 168.61±4.72µg/ml

Conclusion

In this study, August consistently exhibited the highest values for both monthly yield and antioxidant activity in the utilization of *S. tora* leaves. Therefore, harvesting *S. tora* leaves in August is advisable for their potential use as antioxidant materials.

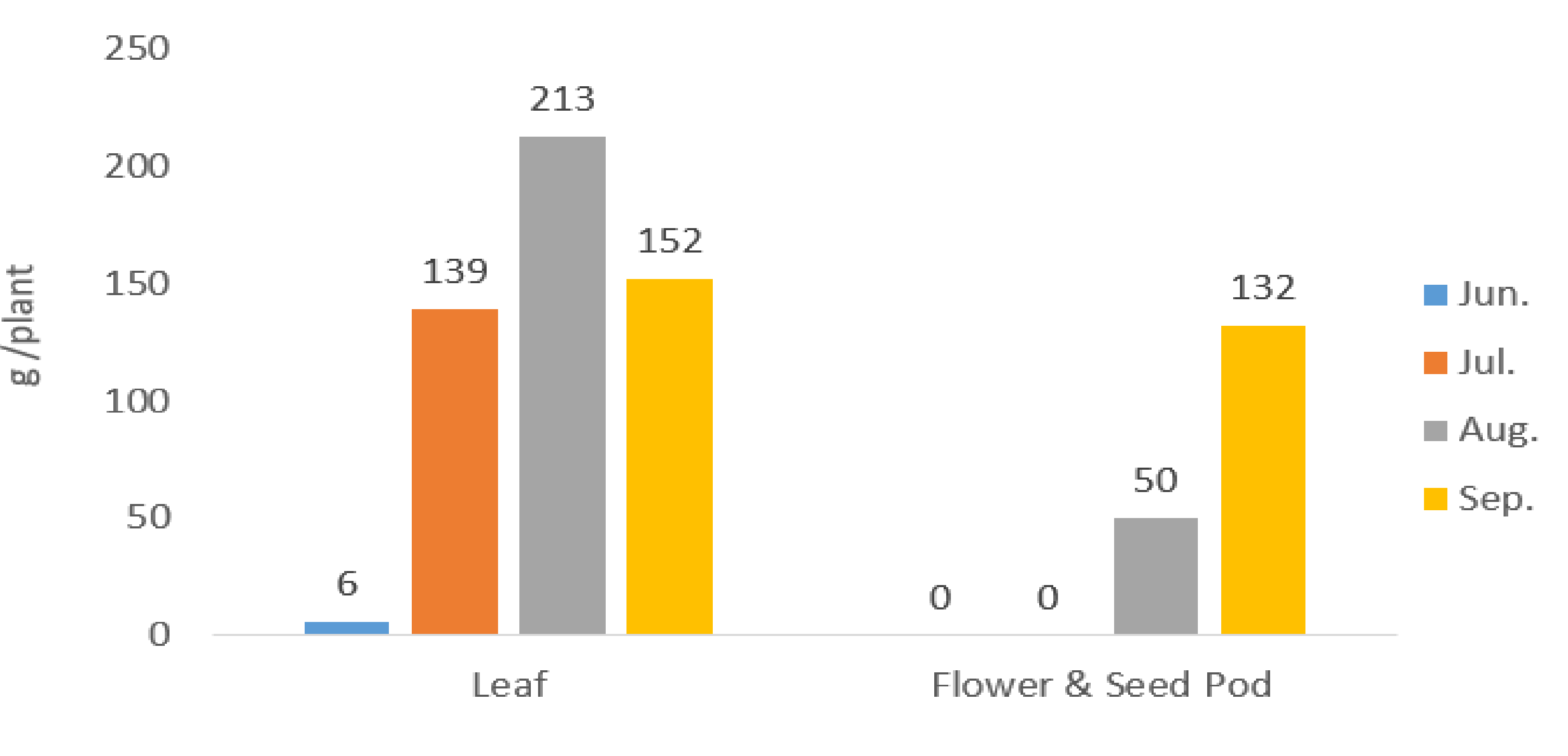


Fig. 1. The leaf yield per plant of *Senna tora* by month

Table 1. Total contents of polyphenol and Flavonoid of *Senna tora* leaf extracts by month

Extract by harvest time	Total Polyphenol (mg GAE/g)	Total Flavonoid (mg CE/g)
Seed	62.88 ± 3.08 ^c	49.58 ± 1.14 ^d
Jun.	103.83 ± 2.68 ^b	84.35 ± 3.13 ^b
Jul.	102.92 ± 2.18 ^b	85.85 ± 3.00 ^b
Aug.	125.34 ± 1.66 ^a	104.69 ± 0.42 ^a
Sep.	100.99 ± 3.03 ^b	75.37 ± 0.95 ^c

Data represent the means ±SD (n=3). Means separation within columns by Duncan's Multiple Range Test (DMRT, p<0.05). GAE: galic acid equivalent, CE: catechin equivalent

Table 2. Antioxidant activity of *Senna tora* seed and monthly leaf extracts by month using DPPH and ABTS

Extract by harvest time	DPPH IC ₅₀ (µg/ml)	ABTS IC ₅₀ (µg/ml)
Jun.	139.35 ± 0.41 ^d	209.83 ± 9.74 ^c
Jul.	272.78 ± 7.43 ^f	325.61 ± 50.40 ^d
Aug.	110.94 ± 1.19 ^b	225.03 ± 21.18 ^c
Sep.	129.59 ± 2.86 ^c	168.61 ± 4.72 ^b
Seed(control)	148.13 ± 2.61 ^e	203.00 ± 15.18 ^{bc}
Ascorbic Acid (positive control)	4.45 ± 0.24 ^a	-
Trolox (positive control)	-	37.95 ± 8.56 ^a

Data represent the means ±SD (n=5)
Means separation within columns by Duncan's Multiple Range Test (DMRT, p<0.05)



Fig. 2. Monthly growth changes in field cultivation of *Senna tora*. A: June, B: July, C: August D: September