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ESTIMATION OF NECTAR CONTENT IN *CALOTROPIS* SPECIES

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ABSTRACT

Flowers of *Calotropis* R. Br. have coronal outgrowths that contain nectar. We estimate the nectar contents of these flowers so as to get an idea of how much nectar can be harvested if direct harvesting is done or how much of honey could by produced if it is indirectly collected through honeybees. Graph paper wetting method, centrifugation method, syringe or suction method, honeybee method and pressing method are being standardized for estimation of nectar and honey potential of various species and variants of *Calotropis* genus namely *Calotropis procera* R. Br. (blue rotate corolla, blue cup-shaped corolla) and *C. gigantea* R. Br. (blue flower, white flower) to identify promising nectar and honey yielding calotrops. *C. gigantea* blue and *C. gigantea* white are promising nectar-yielding calotrops.

Key words : *Calotropis gigantea, C. procera, Corona, Honeybees, Nectar.*

Species of *Calotropis* R.Br. genus belonging to asclepiadaceae family are medicinal weeds of xeric habitats. They grow well under normal mesic conditions. They are on the way to domestication because of many uses and potential. In fact, *C. gigantea* makes a very good live and dead standard for climber crops (Singh 2010). Flowers of *Calotropis* have evolved special floral organs called coronal outgrowths. The collective term for all the coronal outgrowths of a flower is corona. The coronal outgrowths contain nectar that attracts nectar suckers and pollinators. We try to estimate the nectar contents of the *Calotropis* species to get an idea of how much nectar can be harvested if direct harvesting is done or how much of honey could be produced if it is indirectly collected through honeybees. The preliminary results of the study are being reported here.

MATERIALS AND METHODS

Four types/variants of *Calotropis* species available in our study area constitute the study materials. These are 1. *C. gigantea* blue (cgb), 2. *C. gigantea* white (cgw), 3. *C. procera* blue (cpb)- cup shaped corolla, and 4. *C. procera* blue (cpb)- rotate corolla. The nectar contents of above plants estimated through graph paper wetting method and syringe or suction method are given as following:

1. Graph paper wetting method : It is a destructive method that destroys the flower but very easy and handy method for rough estimates in the field. Coronal outgrowths are pressed with thumb on a graph paper put on a glass sheet. The nectar comes out and wets the graph paper. The wet area is outlined with a fine-tip pencil. The wet area is counted in terms/units of squares (mm^2 or whatever) (Figure 1). The data are given in table 1.

2. Centrifugation method : It seems to be a non-destructive approach that might leave the flowers intact so that they may be used for decorative purposes, garlands etc.

3. Pressing method : It seems to be a destructive but easy, practicable and complete extraction method. However, some latex contamination is expected.

4. Through honeybees : ***Calotropis*** plants are to be enclosed and honeybee box to be put inside the enclosure forcing the bees to collect nectar from *Calotropis* flowers only. The resulting honey will be *Calotropis* honey. The *Sapindus* honey is supposed to be of good quality. Similarly, the *Calotropis* honey will be judged for its quality.

5. The syringe or suction method : This method is giving a very precise estimate and almost without latex contamination. Vertical section of coronal outgrowth indicates the presence of three pouches of unequal sizes. The nectar contents of three different pouches seem to be proportionate to the pouch size/capacity. The organoleptic tests of nectar from all the three pouches seem to be agreeable.

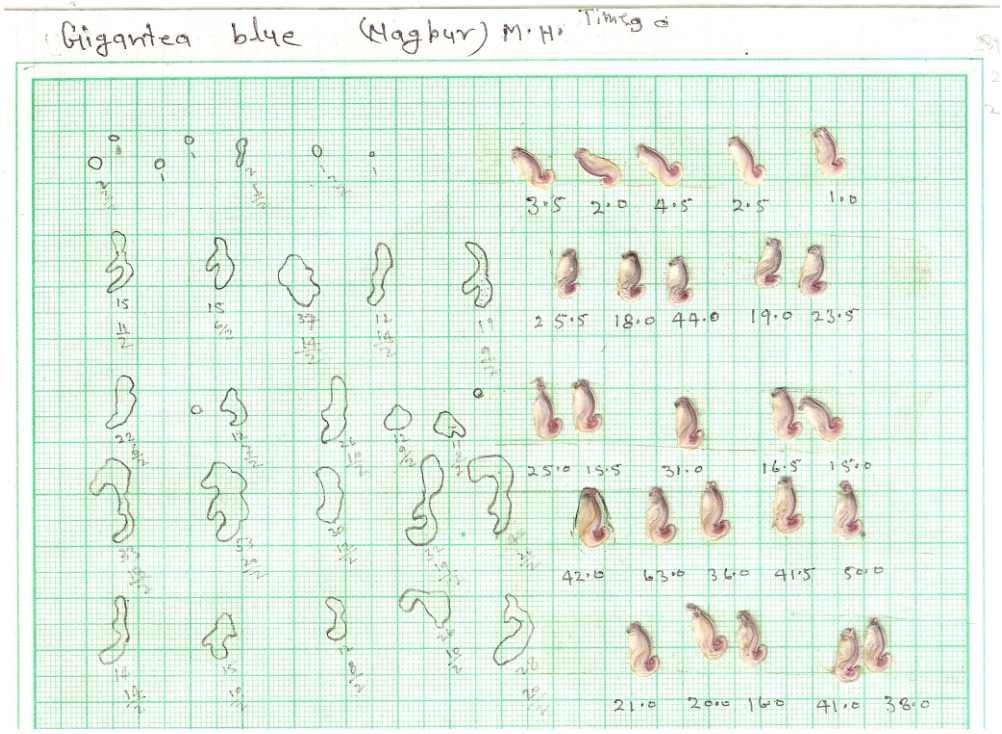

Table 1 : Data of graph paper wetting method.

Calotropis procera blue rotate, Nagpur, MH.					Maximum	Minimum	Average	
3.5	1	2.5	9	2	9	1	3.6	
2	2	5.5	3	4	5.5	2	3.3	
9.5	6	7	12	7	12	6	8.3	
Calotropis gigantea blue, Nagpur, MH.								
9			4.5		9	4.5	6.75	
11	10.5	16	13.5	10	16	10	12.2	
11.5	14.5	23	13	5.2	23	5.2	13.44	
59.5	58.5	35.5	54	44.5	59.5	35.5	50.4	
Calotropis gigantea blue, Nagpur, MH.								
3.5	2	4.5	2.5	1	4.5	1	2.7	
25.5	18	44	19	23.5	44	18	26	
25	15.5	31	16.5	13	31	13	20.2	
42	63	36	41.5	50	63	36	46.5	
21	20	16	41	38	41	16	27.2	
Calotropis gigantea white, Amla, MP.								
1	2.5	6	2.5	4.5	6	1	3.3	
10	10.5	14	18.5	24	24	10	15.4	
2	3.5	3	3.5	5.5	5.5	2	3.5	
7.5	18.5	13	18.5	14	18.5	7.5	14.3	
Calotropis gigantea blue, Amla, MP.								
30	31.5	23	24	25.5	31.5	23	26.8	
5.5	18.5	39	15.5	50.5	50.5	5.5	25.8	
4.5	5	27.5	24.5	22.5	27.5	4.5	16.8	
3.5	4.5		10.5	2	10.5	2	5.125	

There is a lot of variation in the nectar contents of coronal outgrowths ranging from one unit to 63 units. The minimum and maximum in table 1 show the lower and the upper limits of available nectar whereas average shows the actual harvestable amount

available at the time of data collection. The variation in nectar content is due to variation in plant species and activities of nectar-suckers and/or pollinators. There are possibilities of freeze drying method for high quality flower production and/or nectar collection at commercial scale. Freeze dried flowers may be used in the treatment of cold, cough and asthma (Singh, *et.al*. 1990; William 1927). Garlands could be made from buds, whole flowers, corona, whole flower minus corona and tried for their market value.

CONCLUSIONS

Calotropis gigantea blue (Nagpur) 63 units are the highest yield so far. Graph paper wetting method is an easy method of nectar content estimation in field situation. Syringe method is giving very precise estimate. By end of work, standard nectar estimation methods will be available. Promising nectar-yielding *Calotropis* are *C. gigantea* blue and *C. gigantea* white.

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