

MORPHOLOGICAL CHARACTERS OF GENUS CHAMAECRISTA MOENCH AND ITS SPECIES FROM MAHARASHTRA.

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ABSTRACT

Three species of *Chamaecrista* i.e. *Chamaecrista absus*, *Chamaecrista pumila*, and *Chamaecrista mimosoides* were collected from different localities of Maharashtra. Morphometric studies were performed with various quantitative characters i.e. dimensions of leaflets, petiole, petals, pods and seeds with the aim to search stable, distinct and diagnostic characters for the identification of this genus and their species. Qualitative characters were also considered. The morphological characters were found to be sufficient to segregate *Chamaecrista* from the genus *Cassia*. It was concluded that the species of *Chamaecrista* were distinct and could be delimited on the basis of morphological characters

Key words: *Chamaecrista*, Morphometric, Delimitation.

Introduction:

Cassia L. is the largest genus of subfamily Caesalpinioideae. *Cassia* ranks among 25 largest genera of the dicotyledonous plants (Irwin and Turner, 1960). Monumental work on this genus was carried out by Bentham (1871); Bentham and Hooker (1876) which led to further classification of the genus *Cassia* L. Irwin and Barneby (1981) subjected the genus to some nomenclature and taxonomic changes that eventually led to the splitting of the genus into smaller genera i.e. *Cassia*, *Senna* and *Chamaecrista*. *Chamaecrista* Moench. has a complex taxonomic history (Irwin and Barneby 1978). It has been differentiated from *Cassia* L. by Irwin and Barneby (1982). One of the most distinct morphological characters is the presence of sticky glandular hairs (SGH) and extrafloral nectary's (EFN) on the petiole and Rachis. Present investigation was undertaken on proper identification and classification of this genus and its species.

Materials and methods:

Three different species of genus *Chamaecrista* were collected from different localities of Maharashtra, i.e., *Chamaecrista absus* (L.) Irwin & Barneby, *Chamaecrista mimosoides* (L.) Greene, *Chamaecrista pumila* (Lam.) Singh. The collected specimens were identified by using regional floras and literature study. The habit and habitat of each species were recorded. Qualitative morphological characters were studied which include: leaflets -shape, base and apex. Other characters studied were: stipule shape, colour of petals and sepals. Quantitative morphological characters were measured with the help of metric ruler; it includes length and breadth of leaflets, fruits, petals, sepals, petioles. The collected specimens were processed and deposited as voucher specimens at Dr. BAMU Herbarium, Department of Botany, Dr. Babasaheb Ambedkar Marathwada University, Aurangabad.

Result and discussion:

1. *Chamaecrista absus* (L.) Irwin & Barneby

It is an Annual, erect 20-45 cm tall herb, leaves 3-5 cm long, rachis glandular hairy, stipules simulate, linear, leaflet 2 pairs, elliptic-oblong to elliptic-obovate, gland dotted and pubescent on both surfaces between both pairs of leaflets; Flowers 8 mm across, in erect, terminal or leaf opposed, up to 11-flowered racemes; bracts ovate, bracteole one; sepals hairy, oblong, ovate, glandular hairy on back. Petals yellow; turning brick red, obovate. Stamens five, anther dehiscing through apical pores. Pods compressed, hairy, 5-8 seeded. Seeds are ovoid, black. (Singh, 2001). (Plate 1).

2. *Chamaecrista pumila* (Lam.) Singh.

It is an annual, prostrate or diffuse, spreading, branched, 10-40 cm long herb, stem woody at base, pubescent; leaves 3-6 cm long, rachis hairy, petioles with a peltate stalk gland below the leaflets, stipules lanceolate acute; leaflets 12-20 pairs, sub sessile, linear-oblong, ciliate, base unequal sided, glabrous or minutely pubescent, apex rounded and apiculate; flowers 1-3, supra axillary, pedicel pubescent;

bracts lanceolate, bracteoles linear, acute, persistent; sepals divided to the base, pubescent on the back; petals bright yellow, oblong - orbicular, unequal, as long as calyx nearly clawed; stamens 5, equal, all fertile; pods strap-shaped, straight or slightly falcate, sparsely hairy, 10- 15 seeded; seeds rhomboid, dark brown. (Singh, 2001). (Plate 2).

3. *Chamaecrista mimosoides* (L.) Greene.

It is an erect or diffuse, branched, 30-90 cm tall herb, woody at base, branches hairy; rachis slender with flat sessile gland on short petiole of 3-4 mm, stipules ovate- lanceolate, cuspidate; leaflets 30-60 pairs, crowded and overlapping, sessile, linear, sparsely pubescent, obliquely truncate or rounded at base, sub-acute, mucronate apex; flowers 1-3, supra axillary, racemose, pedicels slender, pubescent; bracts lanceolate, cuspidate; bracteoles 2, linear-lanceolate, acute; sepals unequal, oblong-lanceolate; petals yellow, obovate-orbicular, clawed; stamens 10, all fertile, 3 reduced to staminodes, unequal, anthers dehiscing by apical pores; pods linear, strap shaped, flat, pubescent, 5-22 seeded, valve coiling on dehiscence; seeds obliquely obovoid, compressed, brown, polished. (Singh, 2001). (Plate 3).

Table 1: Summery of vegetative / morphological characters of the Genus *Chamaecrista*

Characters	Leaflet					Base	Length	Shape of Petiole	Presence of Gland	Petiole length
	Nu.	Shape		Apex						
Species		Oblong	Linear	Rounded	Mucronate	Rounded	Unequal			
<i>Chamaecrista absus</i>	2	+		+		+		Acute	+	2.5- 3.5 cm
<i>Chamaecrista mimosoides</i>	30-60		+	+			+	Lanceolate	+	3-4 mm
<i>Chamaecrista pumila</i>	12-20		+		+			Lanceolate	+	3-4 mm

Table 2. Summary of floral morphological characters of the Genus *Chamaecrista*

Characters	Pedicel surface		Sepal surface		Petal shape			Inflorescence type		Fruit shape		Fruit size	
	Pubescent	Glabrous	Pubescent	Ciliolate	Oblong -	Obovate	Ovate	Terminal	Cylindric	strap shaped	compressed	Length	Width
C. Absus	+		+		+		+		+			2-4.5 cm	0.5-0.6cm
C. mimosoides	+		+		+		+	+			+	1.5 cm	0.4-0.5cm
C. pumila	+		+		+	+		+			+	2-3 cm	0.4 cm

All of the species were herbs. The number and length of leaflets showed variation from *C. absus* to *C. mimosoides*. Shape of the leaflet was also variable i.e., *C. mimosoides* and *C. pumila* showed linear leaflets and they differed in their base of the leaflet. *C. mimosoides* showed rounded base while *C. pumila* showed unequal bases. Shape of petiole was acute in *C. absus* while in other two species it was lanceolate. All the three species showed similarities in their pedicel and sepal surfaces. They also showed variation in their pod length. *C. absus* had strap shaped pods while the two species were having compressed pods.

On the basis of these observations, key was developed for the identification of three genera, *Cassia*, *Chamaecrista* and *Senna*.

Key to the identification of genera:

1a. 3 Stamens sigmoidly curved and longer, 5 straight and shorter; bracteoles 1 or 2 present at the base of the pedicel; pods elongate and cylindrical.....*Cassia*
 1b. All stamens straight or simply incurved; bracteoles absent or 2, present on the middle or above the pedicel; pods flattened or Compressed.....2

2a. Fertile Stamens 3 to 5; bracteoles 2; glands disc shaped.....*Chamaecrista*
 2b. Fertile stamens 7; bracteoles absent; glands when present claviform or Phalloid*Senna*

Key to the identification of species of *Chamaecrista*:

1a. Leaflets 2 pairs, *Chamaecrista absus*
 1b. Leaflets more than two pairs 2
 2a. Plant prostrate, leaflet 20-22 pairs.....*Chamaecrista pumila*
 2b. Plant erect, leaflet 30-60 pairs
Chamaecrista mimosoides

The study thus favours separation of genus *Chamaecrista* from *Cassia*. It has unique combination of characters. The 3 species included in this genus are distinct and sharply delimited.

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