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POSITION OF *MUNDULEA* BENTH.: A CHEMOTAXONOMIC VIEW POINT

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ABSTRACT

Different flavonoids, isolated so far from different species of the two genera *i.e. Mundulea* and *Tephrosia* have been reviewed. On the basis of basic similarity in their chemical constituents these two genera have been suggested to be included within the tribe Tephrosiae Hutch.

INTRODUCTION

It has been observed that different views have been expressed regarding the taxonomic treatment of two genera i.e. *Tephrosia* and *Mundulea* under Fabaceae. Bentham (1865) and Taubert (1865) placed these genera in the subtribe Tephrosiae and Tephrosineae respectively under the same tribe Galegae. Hutchinson (1964) gave the rank of those subtribes to the tribe Tephrosieae. In order to make the tribe homogeneous he eleminated most of the woody members excepting *Mundulea* even though it bears certain exceptional features as compared to other members of Tephrosieae creating a dispute regarding its systematic position.

It is the purpose of this section to have an idea whether flavonoids isolated so far from different members of those two genera could give a better understanding of their taxonomic position.

Flavonoids isolated so far from different species of *Mundulea* and *Tephrosia* are represented in the Table-1.

Table-1

Flavonoids from different species of *Mundulea* and *Tephrosia*

Genus and Species	Source	Flavone	Flavonol	Isoflavone	Rotenoids
Mundulea sericea (Herbert *et al.*, 1960 ; Finch and Ollis, 1960; Burrows *et al.*, 1959; Worsley, 1935, 1936; Rao, 1945)	Bark			Mundulone	Rotenone, Degulin, Tephrisia, Munduserone
	Palnt		Sericetin		
	Leaves		Isorhamnetin		
M. suberosa (*M. sericea*) (Worsley, 1935; Dutta, 1956, 1959)	Root			Munetone	
	Root bark				Rotenone, Isorotenone
Tephrosia virginia (Delfel *et al.*, 1970 ; Rangaswami and Ramasastry, 1956; Dalziel, 1937)	Root				Rotenone
	Petiole, Stem				
	Root And Leaflet				Rotenone, Degulin,
	Seed				Isodegulin
T. macropoda (Roark, 1937)	Plant				Rotenone, Degulin
T. polystachyoides (Vleggaar *et al.*, 1972, 1973 ; Smallbergar *et al.*, 1971)		Tephrostachin Tephrodin Stachyoidin Tachrosin			

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Table-1 (Contd.)

Genus and Species	Source	Flavone	Flavonol	Isoflavone	Rotenoide
T. candida (Krishna and Ghose, 1937)	Seed, Root bark, Root and Pod. Stem, Leaf and Flower				Rotenone Tephrosin
T. lanceolata (Ayengar *et al.*, 1973; Rangaswami and Ramana Rao, 1955)	Root bark Leaf	Lanceolatin A Lanceolatin B	Rutin		
T. vogelli (Irvine and Freyre, 1959; Marz, 1932, 1935; Rangaswami and Ramasastry, 1956; Dalziel, 1937; Rangaswami and Rao,1959)	Seed	Vogeletin			Rotenone, Degulin, Dehydrodegulin Tephrosin, Toxicarol
T. purpurea (Clarke and Banerjee, 1910; Basu, 1972a, 1977a)	Leaf Root		Rutin		Rotenone, Degulin, Tephrosin, Isotephrosin
T. hamiltonii (Basu, 1977b)	Leaf		Rutin		
T. wallichi (Basu 1972 ab)	Leaf		Rutin		Wallichin
T. hirta (Rangaswami and Ramaswastry, 1956)	Root bark				Toxicarol
T. maxima (Rangasami and Ramasastry, 1956; Kukla and Seshadri, 1962; Ollis, 1962)	Root			Maximin, Maxima substance A, Maxima substance C	Rotenone, Degulin, Tephrosin, Isotephrosin, Toxicarol
T. toxicaria (Roark 1931, 1937; Clarke, 1930)	Root				
T. densiflora (Dalziel, 1937; Krishna and Ghose, 1937)	Root bark, Leaf				Rotenone, Tephrosin
T. semiglabra	Plant	Semiglabrin			
T. obovata (Ynn-Linchin and Heug)	Plant Leaf root				Rotenone, Toxicarol, Tephrosin

CONCLUSION

From the review of different flavenoids, found in the genera it appears that various flavonols are present in *Mundulea*. On the other hand *Tephrosia* is rich in flavones of various types. This observation supports the idea made earlier by Batesmith (1954) that flavones prodominate in herbaceous species while flavonols are common in woody members. Some of the flavones in *Tephrosia* are so advanced to eliminate completely the -OH group in the "B" ring of flavonoid structure, as in the case of tachrosin, stachyoidin and tephrodin. Such type of elimination of -OH in the 'B' ring is also found in cericetin, commonly found in *Mundulea*. This type of elimination of -OH is an advanced character (Harborne, 1971) and may be derived due to parallel line of evolution within the tribe that is one towards the retention of woody habit and the other towards the attainment of very small herbaceous forms. These two genera also show their characteristic isoflavone of which the complex isoprenoid type i.e. munetone in *Mundulea* is very interesting.

Rotenoids are apparently less widely distributed in nature. Out of these compounds rotenone has been isolated from *Mundulea* and *Tephrosia* along with other members in Fabaceae (Harborne, 1971 ; Harper, 1940). As this compound is not completely specific to a particular group of plants, it is supposed to be of no systematic value. Besides rotenone a considerable number of related compounds have now been reported from

various species in the tribe Tephrosieae. Out of these tephrosin is very common in most of the species of *Tephrosia* so far studied and is also found in *Mundulea*. As *Tephrosia* is very specific for these two genera, it may be considered very important from the point of legume chemo-taxonomy.

Thus the chemical constituents of *Mundulea* are found to be very much similar to those of *Tephrosia* rather than to other members of Fabaceae.

Though different authors might wish to place the two genera from Calegae to Delbergieae (Gille H. *et al.* 1970) or Phaseoleae (Cumbie, 1960) the present chemical review supports that the two genera *Mundulea* and *Tephrosia* should constitute a separate tribe Tephrosieae Hutch. in the legume taxonomy.

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