

PRELIMINARY STUDIES ON THE GENUS *MONARDA*
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The genus *Monarda* as it occurs in Oklahoma has long needed critical study. *Monarda* belongs to the mint family (Labiatae) which is composed of herbs with square stems, opposite aromatic leaves, and two-lipped corollas. At present there is great confusion in its classification. Many descriptions are incomplete and synonyms are common. So far no work has been done on this genus in Oklahoma and the distribution of species which occur in the state is uncertain.

Monarda possesses a wide geographical distribution in North America, extending from Quebec southward to Florida, thence westward to Arizona and north to British Columbia. The Index Kewensis through 1930 lists seventy-seven species. Fifteen of these are thought to occur in Oklahoma.

At the beginning of the investigation it was necessary to make a composite description for each species which occurs in the state by collecting the descriptions available from reference books. Out of these, an original key was made to aid in identifying unknown specimens. The two hundred specimens in the Oklahoma University herbarium were then examined and in many cases renamed according to these descriptions.

In order to get type specimens and a greater number of plants for comparison, specimens are being borrowed from other herbaria including the Gray Herbarium of the New York Botanical Garden, the Missouri Botanical Garden, and others in neighboring states. With the aid of these specimens, it will be possible to write original, complete descriptions of each species which we have in Oklahoma, to make drawings of their distinguishing characters, and to plot their distribution on a map.

The large attractive flowers of *Monarda* occur in verticels closely surrounded by bracts. Depending on their arrangement, the species may be divided into two chief groups; (1) one in which the flower clusters are terminal and only rarely axillary, with stamens exserted and (2) the other in which the flower clusters are both terminal and axillary with several whorled heads in a spicate arrangement.

The first group includes *Monarda fistulosa* and *M. mollis*, the most widely distributed species. According to the Index Kewensis, *Monarda mollis* is a synonym of *M. fistulosa* and upon examining the specimens, very little difference has been found between them. Specimens which have been given both names grade into each other until it is very difficult to find any line of demarcation. *M. fistulosa*, in general, has a leaf pubescence of spreading hairs, is finely serrate, and dark green. *M. mollis* is glabrous or minutely puberulent but not pubescent, is more coarsely serrate, and has paler leaves. I would suggest that *M. mollis* be made a variety of *M. fistulosa*, as was done by Bentham in *M. fistulosa*, var. *mollis* Benth. This variety is more common in Oklahoma than *M. fistulosa*.

Two species of the first group in which the leaves are nearly sessile are *M. Bradduriana* and *M. Russelliana*. The only difference between these two is the amount of pubescence in the throat of the calyx. *M. Bradduriana* is hairy while *M. Russelliana* is glabrous. But there are varying degrees of pubescence in the specimens. Probably *M. Russelliana* should be made

a variety of *M. Bradburiana*. The majority of the specimens occurring in Oklahoma have pubescence in the calyx throat.

Two constant characters which are easily adapted to classification are the bracts and the calyx teeth. The attractive flower clusters are closely surrounded by conspicuous bracts which vary in shape, coloration, and pubescence. The calyx teeth vary in shape, spread, and the presence of glands. The calyx drawings of Britton and Brown are slightly incorrect as they all show only ten nerves, while there are really fifteen. Species with spicate flower clusters may be classified by their bract and calyx characters.

Leaves are all simple and opposite but vary in marginal characters and pubescence. Their shape varies from ovate to lanceolate.

As yet, only a very limited occurrence of the following species which occur in Oklahoma has been found:

1. *Monarda hirsutissima* Small.
2. *M. citriodora* Cerv.
3. *M. lasiodonta* (A. Gray) Small.

The most commonly occurring species are:

1. *M. Bradburiana* Beck.
2. *M. clinopodioides* A. Gray.
3. *M. dispersa* Small.
4. *M. mollis* L.
5. *M. punctata* L.