
XX. *On two Genera of Plants belonging to the Natural Family of the Aurantia. By Joseph Corrêa de Serra, LL.D. F.R.S. & L.S.*

Read July 2d, 1799.

THE object of this paper is to examine the generic characters and the natural affinities of the *Crateva Marmelos* of Linnè, and of the *Crateva Balangas* of Kœnig; two plants, each of which I conceive to be a genus by itself, not only distinct from the *Crateva*, but also belonging to a different natural order.

Among the many advantages deriving to botany from the progress made of late in the knowledge of the natural affinities of plants, one of the most obvious is the facility it affords in many instances, of recalling to their natural places, plants which, by oversights unavoidable in artificial systems, even the most ingenious, had been associated to extraneous genera. Of this advantage the examination of the two plants above mentioned will, I presume, afford an example.

The affinity of the genus *Crateva* (such as it was first constituted by Plumier*, and adopted by Linnè†,) to all the genera of the *Caparides*, is obvious to every inquirer of natural affinities. However different the principles might have been on which natural arrangements of plants have been attempted, this association has been al-

* Under the name of *Tapia*. *Plum. Nova. Plant. Gen. p. 22. t. 21.*

† In the first edition of *Gen. Pl. p. 113.*

ways acknowledged as strictly natural. To the sagacity and profound science of Jussieu we are of late indebted for the constant and almost exclusive characters which distinguish this family, and circumscribe its affinities. He remarked, that the seeds in this natural order contain a crooked embryo without perisperm; that their placentation is always parietal, in a fruit which in consequence must be mostly unilocular*.

The *Crateva marmelos* of Linnè, and the *Crateva balangas* of Kœnig, I have observed in the herbarium of the Right Hon. Sir Joseph Banks, and I have received the fruits of both from him. Upon examining the fruits I have found that their seeds contain a straight embryo with a small radicle, and fleshy, large, plano-convex cotyledons; and that their placentation is central, in a multilocular fruit: they cannot therefore be species of *Crateva*. The further examination of the other parts of their fructification confirms this first opinion, and, shewing how far they differ from the *Crateva* in other important points, gives us a clue to find their proper place in the natural system.

But before I proceed to the description of the fructification of these two plants, as I intend to deviate in some manner from the common method of describing, I must give the reasons which persuade me of the utility and perhaps necessity of the alterations I adopt, and show that singularity, or spirit of innovation, are not my motives, but that the present state of science requires, in some manner, this change of method.

Of the six divisions in the Linnæan method of describing genera, four relate to the flower, and exist at the same period, viz. the calyx, coroll, stamina, and pistill; the other two exist after the decay of the preceding, viz. the pericarp and the seed. They are the off-

* Jussieu Gen. Pl. p. 246.

spring of the flower rather than a part of it; and their structure at the period when they are the objects of observation and description, has often received material alterations from their state when in the flower. Linnè considered them in this light, when he described the germen, that is to say, the fruit as it exists in the flower, as a part of the pistill; and again described it in the articles of pericarp and seed, to show its structure as it exists, long after the decay of the flower, when ripe and perfect.

Former botanists having given great attention to the calyx and coroll, and the sexual system being founded on a minute consideration of the stamina and pistill, these four parts are accurately and carefully exhibited in the Linnæan descriptions of genera, but this is not the case with respect to the fruits or the seeds. We are at present enabled, by the observations of Jussieu, Gærtner, and a few other botanists, to describe these important objects with an accuracy unknown to former ages, and to collect from the detail of their parts a number of characters, (many of them of great weight,) which, multiplying the points of comparison, establish more firmly the degrees of affinity or difference betwixt plants, and thereby lead us to a more intimate knowledge of their nature. Even in the description of the flower, the progress made by botany since the death of Linnè requires perhaps some change: 1st, Because the insertion of the stamina, a character of a superior order, was by him carefully marked only in the Icosandria, Polyandria, and Gynandria, in which classes it is (if I may be allowed the term) the classific character. 2dly, Because in proportion as that multitude of different organs which go by the general and in many instances unmeaning name of *nectarium*, are physiologically discriminated, and accurately defined, the necessity of marking them for what they are in nature, is more and more sensibly felt. And 3dly, because the *germen* itself, as a part of the flower, varies

varies very often, in number of loculaments and of seeds, from the ripe fruit.—The comparison of these two states, of the same object, requires an attention, from those who seek the ways of nature, far greater than has been hitherto bestowed on it.

These reasons, I hope, will be a sufficient excuse in the eyes of every candid Botanist, for my attempting to describe the fructification of the plants which are the subject of this paper, in twelve, instead of six divisions, in the following manner :

1. The *flower*, in the four usual Linnæan divisions of *calyx*, *coroll*, *stamina*, and *pistill*; marking, however, the insertion of the stamina, and the nature of what Linnè, in analogous plants, has called nectarium.
2. The *fruit*, in four divisions, viz. the parts of the flower which persist and accompany the fruit, and which I design by the name of *induvia*, the *pericarp*, the *placentation* of the seeds, and the *debiscentia*.
3. The *seed*, in four divisions, viz. its *form*, its *integuments*, the *perisperm*, and the *embryo*.

The two genera which we are now to consider are deficient in some of these parts; but it is equally interesting to the Botanist to know the absence of such parts, as to be acquainted with their form when present. What new terms I am obliged to employ shall be explained in the notes.

The

The following is the fructification of the *Crateva marmelos* of Linnè, to which, conceiving it to be a new genus, I give the name of

ÆGLE*.

* FLOS.

- CAL. *Perianthium* monophyllum parvum quinquelobum fructum non comitans †.
- COR. *Petala* quinque calyce multoties majora, patentia ovato-acuta.
- STAM. *Filamenta* plurima brevia subulata in receptaculi elevati, feu disci hypogyni parte externa inserta; *Antheræ* oblongæ erectæ.
- PIST. *Germen* ovatum superum. *Stylus* brevis crassus. *Stigma* ovale (fulcis plurimis obsolete fulcatum juxta Kœnig).

** FRUCTUS.

- INDUVIÆ nullæ.
- PERIC. *Bacca* corticosa turbinato-globosa, cortice glabro scrobiculato per maturitatem lignoso. *Loculamenta* (in meo specimine) decem cincta carne spongiosa, post maturitatem evanida.
- PLACENT. *Chorda pistillaris* ‡ composita centralis; chordulæ par-

* One of the Hesperides.

† The calyx remains after the flowers decay, but falls before the maturity of the fruit; as I have seen in the specimens which I have observed.

‡ In every fruit, properly so called, there is a longitudinal bundle of fibres and vessels which may be traced from the insertion of the fruit in the receptacle to the stigma: to this bundle the seeds are affixed, from it they originated, and through it they are most probably fecundated. This important bundle I call *chorda pistillaris*.

tiales

tiales tot quot loculamenta axi fuberoso coalitæ. Semina in unoquoque loculamento plurima simplici serie disposita, funiculo umbilicali recto brevi chordulis affixa.

DEHISC. nulla.

*** SEMEN LIBERUM.

FORMA. Semen subovatum compressum, versùs umbilicum angustatum, pilosum.

INTEG. duplex; exterius coriaceum pilis intertextis glutinosis vestitum; interius membranaceum ad alterum latus funiculo adnato stipatum in obtusiori parte chalazala ferruginea notatum.

PERISP. nullum.

EMBR. femini conformis lutescens, cotyledones duo plano-convexæ carnosæ, radícula minima.

This description is made from specimens sent from India by Dr. Roxburgh, Dr. Ruffel, Dr. Kœnig, and by the Moravian missionaries of Tranquebar.

Two seemingly distinct species of this genus exist in the herbarium of Sir Joseph Banks, both arboreous, and both growing in the East Indies. To that which has been known under the name of *Crateva marmelos*, I continue the old trivial name, and call it *Ægle marmelos*.

The *Crateva balangas* of Kœnig, known to the English in the East Indies by the name of Elephant apple, has the following fructification; and, as a new genus, I give it the name of

FERONIA*.

* FLOS.

- CAL. *Perianthium* monophyllum quinquepartitum planum parvum (deciduum ex Kœnig.)
- COR. *Petala* quinque oblonga acuta patentia calyce multoties longiora.
- STAM. *Filamenta* decem, basi lata compressa, utrinque ad basin villosissima, erecta, in receptaculo elevato seu disco hypogyno inserta. *Antheræ* obovatæ erectæ.
- PIST. *Germen* subovatum superum. *Stylus* brevis conicus. *Stigma* acutiusculum.

** FRUCTUS.

- INDUVIÆ nullæ.
- PERIC. *Bacca* corticosa turbinato-ovata, cortice aspero per maturitatem lignoso. *Loculamenta* plura, carne fungosa obvoluta.
- PLACENT. *Chorda pistillaris* composita centralis; chordulæ partiales, tot quot loculamenta, in basi et apice pericarpium tantum unita, cæterum plus minusve per maturitatem? divergentia. Semina in unoquoque loculamento plura, simplici serie disposita funiculo umbilicali lato chordulis affixa.
- DEHISC. nulla.

* One of the Deities to whom the Ancients dedicated Forests.

*** SEMEN.

*** SEMEN LIBERUM.

FORMA. Semen ovatum lenticulari compressum pilosum.

INTEG. duplex; exterius membranaceum pilis intertextis vestitum, interius coriaceum, in obtusiori parte chalazala ferruginea notatum.

PERISP. nullum.

EMBR. Semini conformis albescens, cotyledones duæ planoconvexæ carnosæ, radícula minima.

This genus I have described from specimens sent from India by Dr. Ruffel and Dr. Kœnig. We are acquainted with only one species, a tree growing in the forests of India, which I call *Feronia elephantum*, from the name by which it goes among the English inhabitants of the East Indies.

Plants are always better described from fresh, than from dried specimens; but in order to satisfy myself, and to be able to answer for the characters, I have scrupulously avoided giving any which were not discernible in the specimens before me*, though Kœnig's descriptions of the *Crateva marmelos* and *Balangas*, are more explicit

* For instance, the hilum I have not marked, in either of the two genera, because I could not sufficiently distinguish its figure. That of the *Feronia* seems to me worthy the attention of the botanists who may have occasion to observe it in a fresh specimen. The flesh, which in both genera surrounds the locuments, I describe such as it was in the dry specimens after having been soaked. The membranes, which form the locuments, I have not described, though essential parts, because I conceive they must be very different in the fresh fruit, from what they appeared to me in the dry specimens. I must notice, however, that their interior surface, in both genera, is covered with large round scars of dried vesicular glands, of which I will hereafter take an opportunity of speaking more at large, and in a more proper place, in a Memoir on the Natural Order of the *Aurantia*.

in what respects the flower, having the advantage of being made from living subjects.

The seeds, the fruits, the insertion of the stamina on a *discus hypogynus*, surrounded by a *calyx monophyllus*, and a coroll of a defined number of petals, shew to a demonstration that these two genera belong to the family of the *Aurantia*. What place they are to occupy among their affinities, and consequently what are their true essential and differential characters, will be discussed in a future paper on this natural order.



Serra, Joseph Correa. 1800. "XX. On two Genera of Plants belonging to the Natural Family of the Aurantia." *Transactions of the Linnean Society of London* 5, 218–226. <https://doi.org/10.1111/j.1096-3642.1800.tb00592.x>.

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