

VII. *On the Indian Species of Menispermum.* By Henry Thomas Colebrooke, Esq. F.R.S. and L.S.

Read November 2, 1819.

AMONG doubtful or imperfect fruits described under barbaric names by the elder Gärtner in the concluding section of his work, the very last which is noticed by him* is one denominated *Wal-tiedde* and *Keipisan Zeylonens.*; concerning which he expresses a doubt whether the seeds be naked or were included in a pericarpium.

On this subject Du Petit-Thouars, followed by Richard† and Decandolle, has conjectured that the plant in question is “a species of *Cissampelos*, of which the seed only has been hitherto described‡.” This guess has undoubtedly approached to the truth; as the seed certainly appertains to a plant of the same natural order, but perhaps of a different genus, being not improbably a variety of Decandolle’s *Cocculus villosus*; or at least very nearly allied to *Menispermum hirsutum* Linn., which (therein following Lamarck) he considers to be but a variety of this author’s *M. villosum*.

I herewith submit to the inspection of the Society the delineations of two kindred plants, from which any one, who will take the trouble of comparing them with Gärtner’s figure of his *Wal-tiedde*, will be satisfied of the near agreement of the fruit.

When the similarity was first remarked by me, I was unaware

* Tab. 180, fig. 12.

† *Anal. du Fruit*, 47.

‡ *Regn. Veg.* i. 532.

that

that a like observation had been previously made by Roxburgh, but unpublished; and, in corroboration of mine, I now transcribe from his manuscript the description of his *Menispermum hirsutum*, and add my own of a plant denominated by him *M. villosum*;—a name pre-occupied, and for which I have therefore substituted another (*M. incanum*).

Roxburgh's *M. hirsutum*, which he considered to be the same with *M. hirsutum* of Linnæus and of Willdenow, and for which he cites a figure from Plukenet's *Phytographia* (t. 384. f. 5.) as agreeing better with it than the figure quoted by them for the plant so named, has cordate leaves (broad-cordate to linear-cordate) and emarginate nectarial scales, with racemes on the male plant, and solitary axillary flowers on the female.

Lamarck's *M. villosum*, identified by him with *M. hirsutum* and *M. myosotoides* of Linnæus, and for which he cites three figures from Plukenet (t. 384. f. 3, 5 and 7), is described with leaves ovate or lanceolate-ovate, and ramose sub-corymbose peduncles, from one to three in an axil*.

Roxburgh's *M. villosum* (my *M. incanum*) has broad-cordate mucronate leaves, entire nectarial scales, and panicles on both male and female plants.

Willdenow's *M. hirsutum*, described from a figure of Plukenet's (t. 384. f. 7) and Houttuyn's *Compilation* (iv. p. 616), has ovate-oblong mucronate leaves, with corymbs on the male plant and racemes on the female. He probably considered Lamarck's *M. villosum* the same with *M. myosotoides* Linn., which is described from Plukenet's third figure (t. 384. f. 3), and Burmann's *Indian Flora* (316), as having linear-lanceolate leaves.

Roxburgh's *M. hirsutum*, said by him to be common in hedges in India, is the only plant which he found that he could compare

* *Dict.* iv. 97.

with *M. myosotoides*. He asks, "Can they be the same?" He first described it on the coast of Coromandel; and, re-examining it in Bengal, delineated anew the fruit, and identified it with Gærtner's *Wal-tiedde*.

I cannot but deem it distinct from Willdenow's *M. hirsutum*, as well as Lamarck's *M. villosum*, on account of the difference of the inflorescence joined to that of the leaves; and I therefore insert the whole of Roxburgh's description for the purpose of comparison.

We have thus four species nearly allied, yet sufficiently discriminated by their leaves, inflorescence, and other specific marks: two of them hitherto unpublished. A third unpublished species with downy leaves may be added from Roxburgh. It is his *M. tomentosum*, described with leaves anteriorly three-lobed, racemes axillary, and nectarial scales entire.

M. fenestratum of Gærtner has been noticed by Decandolle, as by earlier writers, among "species not sufficiently known;" remarking, that the fruit alone has been examined*." He was unapprised that "the plant had been figured and described by Roxburgh, from whose manuscript I subjoin a description of the female plant.

It will be observed, that Roxburgh testifies the accuracy of Gærtner in his representation of the seed. He has also cited that eminent carpologist's figure and description of *M. Cocculus* as a correct representation†. His testimony, though not pointed, must seem to extend to the peculiar character so particularly noticed by Gærtner, and affirmed by him to belong to all the species of the genus, however much these vary in the number of floral parts, yet all agreeing in the singular position of the coty-

* *Reg. Veg.* i. 541. Vide *Lam. Dict.* iv. 101; and *Martyn, Dict.* vol. ii.

† *Fl. Ind. Mss.* cit. *Dec. Reg. Veg.* i. 520.

ledons described as segregate, and occupying distinct cells in the albumen*.

That character is not however found in *M. sepium* (*M. hirsutum* Roxb.) nor in the *M. crispum* Linn. (identified with *M. tuberculatum* Lam. and *M. verrucosum* Roxb.†) In respect of the first mentioned, the delineation before exhibited has, as I trust, established the fact; and in support of the same position, regarding the last mentioned, I herewith offer to the inspection of the Society a complete delineation of it, subjoining Roxburgh's description of the fruit in corroboration of my own. The inflorescence of the female plant and its immature fructification had not been seen and described by him, nor by any earlier botanist, though the species has been so long known and so frequently noticed; and it is chiefly for the sake of the female flower that I now offer a specific description at large.

I may be allowed to adventure a surmise, that the segregate position of the cotyledons is alike wanting in many, perhaps most, other species of this family or genus, notwithstanding the sweeping affirmation of the venerable Gærtner. Indeed his own description of the seed, identified by Roxburgh with *M. hirsutum*, shows it in that instance.

Nor does this disagreement in the characteristic situation of the cotyledons appear to concur with a co-ordinate difference of the flower, to assist the much needed reform of the genus. The nectarial scales are indeed wanting in *M. fenestratum*; and on that ground I wish to propose the construction of a new genus, of which the character may be built upon that plant. But the flower of *M. Cocculus* Gært. (*Cocculus suberosus* Dec.) has not been yet examined and made public; and it is uncertain whether this plant will accompany Gærtner's *M. fenestratum*, or travel apart into another subdivision of the group.

* Gært. *Fr. et Sem.* i. 220.

† Dec. *Reg. Veg.* i. 521.

Before I proceed to propose a generic character for Gærtner's Ceylonese plant, I must premise a few observations on the parts of the flower in that whole group.

The Linnæan genus *Menispermum*, constructed on the Canadian species, assumes for a calyx two short linear exterior leaflets; for an outer corol, six (4—8) ovate, spreading, equal petals; for an inner corol, eight smaller, concave, obcordate scales ranged in a double series: it notices sixteen fertile stamina in the male, and half as many sterile in the female; and 2—3 (rather 2—4) pistils, whence two monospermous berries arrive at maturity. Here the quaternary order, in a simple or double series, or a multiple of it, is apparent.

The defect of a fourth part throughout the fructification would seemingly connect with that character numerous Indian species, in which likewise two small exterior floral leaflets are observed in some, but wanting in others; and rows of calycine leaflets, petals and scales in ternary order; and the ternary proportion single, or a multiple, prevails among stamina and pistils.

The two exterior leaflets do not seem in all, nor in most, of these plants to be a calycine envelope of the flower, but in some are wanting; and in others, again, are evidently mere bractes or floral leaflets, closely appressed to the true perianth in some instances, separate and distant in others, and reduced even to a single bracteal leaflet in certain examples.

The first ternary series of leaflets, or in some specimens a double ternary series of equal leaflets, I take to be in general the true perianth. They are smaller than the next row within. This, which is likewise ternary, and consisting of larger, tenderer, and, in short, petal-like leaflets, appears properly to be the corol.

The innermost row, comprising six scales at the foot of the filaments, commonly much smaller than the ternary range which encompasses

encompasses it, seems to be nectarial. The term of inner corol may however be retained for it, if judged preferable. It is wanting in some plants of this family.

The number of fertile stamens is commonly six : but in one instance three ; in another many. The sterile filaments are in general equally numerous in the female flower.

The number of pistils is commonly three ; but in one instance twelve ; in another six. Their germs contain solitary ovula attached to the middle of the inside of the cell. They ripen into as many drupes or monospermous berries : but in one instance the nut is described by Roxburgh as two-celled.

The seeds are lunulate or spheroidal. In the latter case they contain a chamber or cavity ; and their form is, as it were, generated by a semi-revolution or expansion of the more natural unula.

The quaternary proportion of the American species, contrasted with the ternary of the Indian, furnishes a ready and obvious ground for a first subdivision of the genus, whether into sections or distinct genera. That ground has been taken by Decandolle, who leaves to the Canadian moon-plant and its congeners the name of *Menispermum* ; and severs the rest under the ancient denomination of the most noted Indian sorts (*Cocculus**).

This nevertheless requires revision, with a view to further separations ; as it yet constitutes but a heterogeneous group. Materials, however, are wanting for the complete reformation of it. Of some plants comprehended in it, the male flower only has been examined ; of others, the female ; of several, neither of them, but the fruit alone, or merely the climbing shrub without fructification. It would be premature, then, to attempt the entire rectification of it at present ; though it may be meantime suggested, that the *Menispermum heteroclitum* of Roxburgh,

* *Reg. Veg.* i. 511, 515, and 540.

which is monadelphous, should found a new genus : not to say as much for his triandrous and his hexagynous and dodecagynous species. The task of constructing genera upon the type of the most distinct among these will be here attempted, after a few further observations on the fructification.

The fruit, and particularly the segregate situation of the cotyledons in separate cells of the perisperm, may contribute to the discrimination of genera in this family, and consequent reform, as before hinted : but the shape of the nuciform seed, though various, does not promise to serve for a distinctive character, unless for sections of genera. The four species first noticed in this Essay, *Menispermum sepium*, *hirsutum*, *incanum*, and *villosum* (*Cocculus villosus*), cannot in a generic distribution be disjoined from *M. crispum*, *verrucosum* s. *tuberculatum* (*Cocculus crispus*), as will be evident, if the complete delineations of the plants are compared together : and, on the other hand, the singular structure of the nut with a central chamber, which is so remarkable in the last-mentioned species, recurs in *M. fenestratum* as well as in *Menispermum Cocculus* of Gærtner.

The lunulate or uncinatè and almost cyclical shape of the one, will be found more strictly analogous to the sub-globular but hollow or excavated form of the other, than may be at the first view apparent. For, as before intimated, the one form is but an expansion of the other, being enlarged to afford room for broader seminal leaves of the embryo ; and its solid figure is to be considered as generated by an incomplete revolution of the lunula on its axis : and thus the uncinatè shape, laterally expanded, produces a cavity or chamber in the solid of revolution. The kidney-shaped seed of *Menispermum tomentosum* of Roxburgh, with a pit on the inner side, is the link to connect the two forms.

Upon these considerations, I shall not pretend to deduce any character from the fruit or seed for the genus proposed to be constituted

constituted upon the type of Gærtner's *M. fenestratum*, but rely chiefly upon the total absence of an inner corol or nectarial scales.

It may seem a premature attempt to construct a generic character upon the type of a dioicous plant, the male of which is yet unexamined; and in some measure it assuredly is so. But in this family of plants the floral integuments or exterior parts are usually quite alike in both flowers: and the female exhibits sterile filaments, which in general are equally numerous with the fertile stamina of the male: and for this reason the characteristic features of both may, with a considerable degree of confidence, be concluded from inspection of the female singly.

COSCINIUM.

Dioicous. *Cal.* 3-leaved. *Petals* 3. *Nect.* (int. cor.) none.

Stam. 6! *Pist.* 3. *Drupes* (berries) 1—3, 1-seeded.

Menispermum fenestratum. *Gart.* i. 219. *t.* 46. *f.* 5.

Veni-vell gettah. *Ceyl.*

The absence of an inner corol or nectarial scales occurs likewise as a discriminative mark in another plant, which has been described as a *Menispermum*: but the stamina, being there numerous and monadelphous, furnish, as I think, a sufficient character on which to erect a distinct genus. Though the fruit appear to be that of a *Menispermum*, the calyx and corol are not like the other Indian species of that comprehensive genus.

The plant to which I refer is the *Menispermum heteroclitum* of Roxburgh; from whose manuscript I subjoin a description of it. Presuming the correctness of the association of the ripe fruit with the male plant described, there can be little hesitation on the subject. But, as the female flower has not been examined, nor the plant itself figured nor described, together with the mature fruit, a lurking suspicion may exist that some error has

possibly crept in, to be corrected by future examination when opportunity shall offer.

Meantime, trusting to the usual accuracy of the observer, the following essential character of a new genus is proposed on the foundation of his description. Its denomination is assumed from an Indian term contrasting it with a name of a common *Menispermum*.

ANAMIRTA.

Dioicous. *Cal. ext.* 2-leaved; *int.* 3-leaved. *Petals* 3, equal.

Nect. (int. cor.) none. *Stam.* many, monadelphous. *Pist.* 3!

Drupes (berries) 1—3, 1-seeded.

Menispermum heteroclitum. *Roxb. Mss.*

Proceeding with the task of examining Roxburgh's description of plants referred by him to *Menispermum*, I come to one which he appears to have intended, when delineating it, to erect into a genus; a design which he abandoned when composing his *Flora Indica*. As the plant is polygynous, and the nut affirmed to be bilocular, I apprehend a doubt could scarcely exist (presuming accuracy in regard to the cells of the fruit) as to the propriety of pursuing his earlier view, and severing this plant, which bears but a family likeness to *Menispermum*, and instituting a new genus for its reception.

Yet Decandolle, who identifies this plant with *M. acuminatum* of Lamarck, described* from a specimen communicated by Sonnerat, refers it to his comprehensive genus *Cocculus*; not, however, without a hint for its transfer to another genus†.

The description of the plant in question will be quoted at large from Roxburgh's manuscript: and the following is the essential character proposed for the genus, retaining for it a vernacular name, which is sufficiently sonorous, notwithstanding its barbaric origin.

* *Dict.* iv. 101.

† *Reg. Veg.* i. 528.

TILIACORA.

Dioicous. *Cal.* twice 3-leaved. *Petals* 3. *Nect.* (int. cor.) 6-leaved. *Stam.* 6; alternate ones shorter. *Drupes* (berries) many. *Nut* 2-celled?

T. racemosa.

Menispermum polycarpon. *Roxb. Mss.*

To complete a review of the *Menisperma* collected by Roxburgh, and more or less perfectly described by him, several yet remain to be spoken of, which are sufficiently remarkable to deserve particular notice; besides *M. glabrum* of Koenig, identified with *M. cordifolium* of Willdenow (*Cocculus cordifolius* Dec.), and *M. Columba*, which is the same with *M. palmatum* Lam. (*Cocculus palmatus* Dec.); and exclusive of one named but not described by him, *M. megaspermum*.

The first to be here mentioned is *M. hexagynum*, to which allusion has been before made. The male flower and mature fruit have not been seen and described. But the section of the germ in Roxburgh's figure of the female blossom indicates a genuine member of the family group, to which Decandolle appropriates the name of *Cocculus*; and so do the nectarial scales (or inner corol), and the other parts of the flower, consisting of a three-leaved calyx with a pair of bractes closely appressed to it; three petals twice as large; and six barren filaments.

Another, to which likewise allusion was before made, is *M. triandrum*. The male flower, without either female blossom or ripe fruit, has been figured and described. It has nectarial scales (or inner corol); and in other respects also affords no indication of a fit subject for separation from the larger group in this family, notwithstanding the paucity of its stamina. Its calyx is three-leaved, minute. Its corol urceolate, three-petalled.

One

One more plant is to be mentioned, which is remarkable for its peculiar habit; differing from the whole of the natural order to which it belongs, as it is arboreous, while all the rest are twining shrubs. I mean *M. laurifolium* of Roxburgh: seen likewise by Dr. Buchanan Hamilton and General Hardwicke. The male plant alone has been figured and fully described; the inflorescence only of the female: but notwithstanding its singular habit, which might give occasion to surmise that it has not found its proper place, there is nothing in the fructification, as delineated, which affords any support to such a surmise. It has a three-leaved calyx, a much larger three-petalled corol, six nectarial scales (inner corol), and as many stamina. Probably, therefore, it will remain where it has been put, or rather will pass with its congeners into the genus *Cocculus*.

A singular vivaciousness has been remarked in three or four, and probably holds in more, species of this genus. Wherever the climbing and rambling stem is divided, whether cut or broken, it roots afresh by sending down from the upper portion a thread-shaped root to the ground, and thus continues to derive nourishment from the soil, however distant. Such radican fibres have been measured thirty feet long, and no thicker than a packthread. This character of vivaciousness appertains to *Cocculus tomentosus*, *crispus*, and *cordifolius*; as also *C. Malabaricus*, a plant figured in the *Hortus Malabaricus**, but which has not been re-examined since the days of Van Rheede.

Without any design of undertaking to treat the subject fully, or of attempting to exhaust the topic, a few observations may be here added, tending to clear the way in some measure towards a future reform.

The generic character of Decandolle's *Cocculus*, as it will be here taken, is confined within more restricted limits than as given

* Vol. vii. t. 19 and 20.

by that author. He has made it comprehend certain monoicous plants and hermaphrodite flowers, and sweep several distinct genera established by Willdenow and other writers. I shall briefly notice some of them.

Lamarck, upon specimens communicated to him by Sonnerat, described a species of *Menispermum*, to which he gave the name of *radiatum*; and cited a figure of the *Hortus Malabaricus* (vol. vii. t. 3.) as representing the same species. Willdenow, quoting the same figure, and intimating also his own inspection of a dry specimen, instituted a distinct genus, under the name of *Braunea*, for a plant which he identified with Kœnig's *Menispermum glabrum*. Kœnig's plant of that name is however identified by Roxburgh with *Menispermum cordifolium* of Willdenow, who cites for this species Klein's communication of it by the name of *M. glabrum*; intimating likewise his own inspection of a dry specimen in this instance also. Roxburgh, it is to be observed, is a great authority in regard to Kœnig's botanical researches in India, having been his fellow-labourer in those researches.

The concurrence of two eminent botanists in quoting the same figure from the *Hortus Malabaricus*, is the only ground for presuming the identity of the two plants; their descriptions of which are by no means parallel. It is to be remembered too, that Willdenow had Lamarck's work before him, and made constant use of it when he was employed on the genus *Menispermum*. It appears, therefore, that he was dissatisfied with Lamarck's description, as he has made no reference to it. Indeed, if Willdenow's accuracy may be implicitly trusted in regard to a minutely small flower examined by him in a very dry state, he had good cause for constructing a new genus for a plant, of which the female blossom not only wants the nectarial scales, or inner corol, but exhibits a solitary germ, and in the mature state a tricocous berry.

In truth, Decandolle suspects that it does not properly come into his genus *Cocculus*: but his hint for re-establishing it as a distinct genus is accompanied with a suggestion for associating it with his *Cocculus acuminatus* (*Menispermum acuminatum*), identified by him with Roxburgh's *Menispermum polycarpon* (*Tiliacora racemosa*). That suggestion is seemingly countenanced by the multitude of berries in the mature fruit, stated as from three to six*: but on what authority that number is given does not appear. For Willdenow assigns to his plant (*Braunea menispermoides*) a single tricoccous berry; Lamarck (*M. radiatum*) specifies but one berry; and Van Rheedee describes seven to eight ripe fruits on a raceme, not explaining in the text or by the figure the greatest number ripened from one flower, nor the number of germs comprised in the blossom.

Upon the whole, the identity of the plants appears questionable; and Willdenow's generic character of the plant examined by him may be retained until an opportunity occur for examining a more recent specimen; when it will probably be found that his description needs material correction.

The *Fibraurea tinctoria* of Loureiro, described as having a naked flower, and his *Limacia scandens*, having a quadruple integument of the female flower, and a triple of the male, are scarcely to be reconciled with the generic characters of either Decandolle's *Cocculus* or the Linnæan *Menispermum*. They require no doubt a careful re-examination: but in the mean time must continue unassociated with the genuine species of either genus.

* *Reg. Veg.* i. 528.

COCULUS.

Dioicous. *Calyx* 3-leaved. *Petals* 3. *Nect.* (int. cor.) 6 scales. *Stamina* 6 or 3. *Pistils* 3 or 6. *Drupe* 1—3 (or 1—6), 1-seeded.

Cocculus incanus. C.

Menispermum villosum. Roxb. Mss.

Leaves cordate, entire, villous, mucronate. *Panicles* axillary, shorter than the leaves.

A large perennial climber, native of Chitagong and Silhet in Bengal; named in last-mentioned province *Sundi-lat*. It twines over trees to a great extent, and is in flower and fruit at divers seasons of the year.

Stem perennial, twining, round. The whole plant villous and soft like velvet. Pubescence white. *Leaves* alternate, petioled, broad-cordate to deltoid and ovate, terminated by a minute dagger point, five-nerved, sub-entire; posterior lobes of the cordate leaves round in some, and straight in others. Length 2—4 inches. Breadth somewhat less. *Petioles* round, half as long as the leaf. *Stipules* lanceolate, acuminate, caducous. *Panicles* axillary, solitary or in pairs, shorter than the leaves, subglobular. *Flowers* yellowish-green, inodorous. *Bractes* at the ramifications of the panicle and base of the pedicel, subulate; a minute one appressed to the calyx. *Perianth* three-leaved. *Leaflets* obovate, coloured, villous. *Petals* three, scarcely longer, spreading, alternate with the calycine leaflets. *Nectary* or interior corol, six scales, small, oval, with incurved margins. ♂ *Filaments* six, capillary, erect. *Anthers* two-lobed. *Lobes* round, opening by circular pores at the summit. *Pistil* none. ♀ *Filaments* six, clavate. *Anthers* none, but barren knobs terminating the filaments. *Germes* three, subglobular, flattened on the contiguous sides. *Styles*, from the

inner side of the apex, short. *Stigmas* reflex. *Drupes* one or two, rarely three; lenticular, dark-purple, size of a lentil, succulent, sessile on the scarcely-enlarged summit of the pedicel. *Nut* lapideous, discoid; disk flat, smooth, thinnest towards the base; margin thick, broad, echinate with elevated tubercles, and lobed with deepened furrows; one-celled, one-seeded; with an anterior depressed chamber between the approximated plates of the disk. *Seed* solitary, uncinat, many-lobed, as pitted by the ample furrows of the putamen. *Perisperm* conform to the seed; amygdaline, milk-white: one-celled. *Embryo* inverse, uncinat, almost cyclical, occupying the middle of the perisperm nearly in its whole length; milk-white. *Cotyledons* linear, curved. *Radicle* curved, opposite the point of adhesion of the fruit on its receptacle. C.

Cocculus sepium. C.

Menispermum hirsutum. Roxb. citing Willd. iv. 829.

Wal-tiedde and Keipisan. Gært. ii. p. 488. t. 180?

Leaves broad-cordate to linear-cordate, downy. Male flowers racemed. Female axillary, solitary. R. *Fl. Ind.* *Germ*s three, semi-ovate, one-celled, containing solitary ovules attached to the middle of the inside of the cell. *Drupes* 1—3, nearly round, size of a small pea, marked on the inside near the base with the remaining stigma, smooth, dark purple, full of purple juice. *Nut* solitary, forming nearly a complete ring, with the joining on the inner and underside between the persistent stigma and insertion of the peduncle. *Integuments* three: exterior rugose, consisting of four valves, which fall off spontaneously, exposing the *mediate*, white, rugose, two-valved, nuciform *tunic*, perforated in the middle: inner very thin, adhering to the perisperm. *Perisperm* conform to the seed, of a light brown colour. *Embryo* inverse, annular (as in the *Celosia*). *Cotyledons*

dons two, lanceolate. *Radicle* curved, with its apex opposite to the stigma. R. *Carp.*

A common twining species, found in most hedges. Flowers during the wet season.

Calyx three-leaved. *Corol* three-petalled. *Nectary* six-leaved: leaflets linear, emarginate. ♂ *Filaments* six, clubbed, spreading, shorter than the leaves of the nectary. *Anthers* twin, immersed in the fleshy extremities of the filaments. ♀ *Germ*s three, seemingly united. *Berries* three, kidney-form, black, very juicy, size of a small pea. *Nut* one-celled. R. *Delin.*

COCCULUS tomentosus. C.

Menispermum tomentosum. Roxb. *Mss.*

Leaves anteriorly three-lobed, tomentose. *Racemes* axillary. *Corols* expanding. *Nectarial scales* entire. R. *Fl. Ind.*

It is a native of hedges and thickets over Bengal; but by no means common. Flowering-time February and March. Seed ripe in May and June.

Stem twining up and over trees to a great extent (radicant when broken). *Bark* of the older parts ash-coloured, with small scabrous specks; of the young shoots, downy. *Leaves* alternate, petioled, of a roundish cordate shape; anterior margin generally three-lobed; soft and tomentose on both sides, particularly underneath. Length 3—5 or 6 inches, and nearly the same breadth. *Petioles* round, tomentose, nearly as long as the leaves. *Racemes* generally simple, one, two, or more together, from the germs of the axils of the fallen leaves. *Bractes* minute, caducous, many-flowered. *Calyx* three-leaved. *Leaflets* lanceolate, very small. *Corol* three-petalled. *Petals* roundish; first expanding, then recurved; many times larger than the calyx. *Nectary* six-leaved. *Leaflets* or *scales* obovate, oblong, entire: posterior margins incurved over the base of

the filaments. ♂ *Filaments* six, clavate. *Anthers* two-lobed. *Pistil* none. ♀ *Stamina* none, but six fleshy filaments half as long as the nectarial scales. *Germ*s three, elevated on a hemispheric receptacle. *Styles* scarce any. *Stigmas* enlarged, ragged. *Drupe*s one to three, nearly round, smooth, size of a marrow-fat pea; deep orange. *Seed* solitary, rough, reniform, with a pit on the inside, and a furrowed belt round the exterior or convex side. R. *Delin.*

Cocculus crispus.

Menispermum crispum, Linn.; *tuberculatum* var. α , Lam.; *verrucosum*, Roxb.

Funis felleus (nec *quadrangularis*, Willd.) Rumph. *Amb.* v. t. 44. f. 1.

Native of Sumatra, as well as Java and the Moluccas; and Silhet in Bengal. It is employed in medicine, being a powerful tonic: and is most valued for medical purposes by the natives of Bengal, when found a climber on mango-trees; whence its vernacular name *Am-guruch* (qu. *Cocculus mangiferae*).

Like *Cocculus tomentosus* and *cordifolius*, as well as *malabarius*, and perhaps other species of the same family, whenever a stem or large branch is divided, being cut or broken, the upper portion sends down a long filiform root to the ground, however distant, and continues to vegetate. The economy of these plants bears in that respect an analogy to the Indian *Ficus*.

Stem perennial, scandent, twining, round, radicant when broken, spongy; with warts scattered over the surface: young shoots smooth. *Bark* yellowish-green. *Cuticle* thin, easily detached. *Leaves* alternate, remote, long-petioled, round-cordate, acuminate, finely pointed, entire, smooth on both surfaces: 7—9-nerved: lobes large and rounded. Length 4—6 inches: breadth 3—5. *Petiole* round, smooth, hardly shorter than the leaves.

Male

Male flower: *Racemes* lateral, 1—4 together, simple, round, smooth. *Flowers* in pairs, or three-flowered fascicles, scattered on the raceme; green, inodorous. *Pedicels* slender, divergent. *Bractes* minute, ovate, fleshy, concave; numerous at the base of the raceme, and solitary at the foot of the fascicle. *Perianth* three-leaved: leaflets ovate, minute. *Petals* three, oval, spreading. *Nectary* six-leaved. *Leaflets* cuneate, reflex, inserted on the outside of the filaments near the base. *Filaments* six, filiform, spreading. *Anthems* four-sided.

Female flower on a different plant. *Racemes* lateral, solitary; girt at the base by intricate scales of the germ as bractes. *Flowers* single. *Calyx* and *corol* as in the male. *Nectary* six-leaved: leaflets ovate, inserted at the foot of the rudiments of stamina. *Filaments* six, short, sterile, embracing the receptacle of the germs. *Germes* three, ovate, elevated on a hemispherical receptacle. *Styles* scarce any. *Stigmas* torn. *Drupe*s one to three: ovate-globular, smooth, pale-orange, size of an olive, sessile on a fleshy receptacle; one-celled. *Rind* thin, leathery; with the nut attached by a process from within, penetrating the umbilical pit of the putamen. *Pulp* gelatinous, transparent, easily detached from the rind, but closely investing the putamen. *Nut* unequally reniform: the inferior extremity more pointed, long, thin, externally rugged, smooth, white, two-valved; girt by a longitudinal ridge along the suture; with an umbilical pit opening into a reniform pervious recess formed by a duplicature or continuation of a bony putamen. *Seed* solitary, reniform, externally smooth, with an ample orifice opening into a furrowed cavity. *Perisperm* conform to the seed, almond-fleshy, milk-white, one-celled, composed of two concentric laminae: the inner one excavated, and internally furrowed. *Embryo* shorter than the perisperm, interposed between its laminae, inverse, curved. *Cotyledons* oval, three-nerved,

nerved, leafy, thin, concave according to the curvature of the perisperm. *Radicle* columnar, short, superior. *C.*
Berries 1—3, size of a common grape, oval, smooth, yellow, succulent, marked with the remains of the style on the apex (whereas on most other species it is on one side); one-celled. *Seed* solitary, reniform; a deep pit on the inside. *Exterior* integument subreniform, white, two-valved; *inner* membranaceous. *Perisperm* conform to the seed, amygdaline. *Embryo* curved, inverse. *Cotyledons* oval, three-nerved, very thin. *Radicle* superior. *R. Carp.*

Cocculus cordifolius.

Menispermum cordifolium. *Roxb. cit. Willd. iv. 826.*

M. glabrum. *Kæn. Mss.*

Amrita-valli (Cit-amerdu.) *Rheed. Mal. vii. t. 21.*

Guduchi s. *Guruchi.* *Sans. Gulanch. Hind.*

Leaves round-cordate, smooth. *Racemes* axillary and lateral.

Most common throughout India.

Root large, soft, spongy. *Stem* twining, perennial, very succulent, extending over the highest trees. *Bark* thick, corky, with many elevated scabrous specks. From the branches frequently drop filiform fibres, which continue lengthening till they reach the ground, where they root. Such have been measured thirty feet long, no thicker than a packthread. *Leaves* alternate, petioled, broad-cordate, five-nerved, entire, waved, smooth: about four inches each way. *Petioles* round, smooth, swollen at the base. *Racemes* axillary, terminal or lateral, with a few scattered flowers in separate axils. *Flowers* numerous, small, yellow. *Calyx* three-leaved: *leaflets* oval. *Corol* three-petalled. *Petals* obovate, many times larger than the calyx. *Nectary* six-leaved. *Leaflets* wedge-form, half the length of the petals; margin inflated, and embracing the filaments.

filaments. ♂ *Filaments* six, clubbed, spreading, rather longer than the leaflets of the nectary. *Anthers* twin, immersed in the fleshy extremities of the filaments. ♀ *Filaments* six, fleshy, sterile. *Germes* three, resting on a tumid receptacle. *Styles* very short. *Stigmas* torn. *Drupe*s one, two, or rarely three; size of a small cherry, smooth, red, succulent; pulp very glutinous. *Seed* single, kidney-form: on the inside there is a deep pit, which receives its ligamen. R. *Delin.*

Cocculus palmatus.

Menispermum Colomba. *Berry* *As. Res.* x. 385.

M. palmatum. *Lam.*

Herbaceous, twining, hairy. *Leaves* subrotund, five-lobed: lobes acuminate. *Racemes* axillary, compound.

Cocculus suberosus. *Decandolle.*

Menispermum *Cocculus.* *Gært. t. lxx. f. 7.*

Perennial, twining, scandent. *Leaves* cordate, base truncate, firm and lucid. R. *Fl. Ind.* *Stem* ligneous, thick as a man's wrist. *Bark* deeply cracked, spongy, ash-coloured: of young shoots, smooth and green. *Leaves* alternate, cordate, entire, smooth on both surfaces; obtuse, emarginate; texture hard; lucid above, paler underneath; four to twelve inches long, three to four broad. R. *Mss.**

Cocculus hexagynus. *C.*

Menispermum hexagynum. *Roxb. Mss.*

Twining, villous. *Leaves* parabolic. *Panicles* axillary and terminal. R. *Fl. Ind.*

Native of China, near Canton.

* Since this essay was communicated to the Society, I have learnt that plants have recently flowered in the Botanic Garden at Calcutta; and a description and figure by Dr. Wallich will appear in the Asiatic Researches.

Stem and branches twining to the extent of some fathoms; perennial: tender parts round, and clothed with soft pubescence.

Leaves alternate, short-petioled, from cordate on the old plants to parabolic on the young; all entire, obtuse, with a minute point; smooth above, somewhat hairy underneath: about an inch and a half long, and one broad. *Panicles* axillary, and terminal on short axillary branchlets composed of alternate, expanding, three-flowered pedicels; villous. *Flowers* small, white. *Bractes* small, ovate, woolly; two larger and smother press on the calyx. *Calyx* three-leaved. *Leaflets* cordate. *Petals* three, ovate, cordate, twice longer than the calyx. *Nectarial scales* six, nearly linear, shorter than the petals; apices divided into two very acute lobes. *Filaments* six, between the nectarial scales and germs: barren. *Germes* six; singly reniform, one-celled, one-seeded. *Styles* undivided, recurvate. *Stigmas* simple. R. *Delin.* ♂ unknown.

Cocculus triandrus. C.

Menispermum triandrum. Roxb. *Mss.*

Shrubby, twining. *Leaves* ovate-oblong, pointed, smooth. *Racemes* axillary.

Native of the Malay islands.

Stem consisting of many twining or spreading branches, with smaller flower-bearing branchlets from the base; smooth, deep-green in every part. *Leaves* alternate, short-petioled, ovate-oblong, pointed, entire, smooth on both sides: two to three inches long. *Racemes* axillary, one or more together, rather longer than the petioles. *Flowers* numerous, very minute, yellow. *Calyx* three-leaved, minute. *Corol* urceolate, three-petalled. *Petals* ovate, many times larger than the calyx. *Nectary* six-leaved. *Leaflets* linear-lanceolate, entire, shorter than the petals. *Filaments* three, wedge-shaped, thick and

and fleshy, erect, converging. *Anthers* two pits in the apex of each filament. ♀ Yet unknown.

Cocculus laurifolius. C.

Menispermum laurifolium. Roxb. Mss.

Arboreous. *Leaves* lanceolar, lucid, entire, three-nerved. *Racemes* axillary and lateral, compound.

Indigenous in Nepal and Srinagar.

Trunk short, soon dividing into many divaricate branches, with extreme branchlets drooping. *Leaves* alternate, short-petioled, lanceolar, entire, firm, polished, three-nerved: 3—6 inches long, 1—1½ broad. *Stipules* none, but a tuft of down in the axils. *Racemes* axillary and lateral, as well as terminal: short, scarcely longer than the petioles. *Calyx* three-leaved. *Leaflets* small, lanceolar. *Petals* three, oval; greatly larger than the calyx. *Nectarial scales* six, obcordate. *Filaments* six, shorter than the petals. R. Delin. ♀ Not described.

COSCINIUM.

Coscinium fenestratum.

Menispermum fenestratum. Gart. t. xlv. f. 5.

Native of Ceylon, where it blossoms during November and December. Seed ripe in May and June.

Trunk and large branches scandent, stout, thick, ligneous. *Wood* yellow, bitter. *Leaves* alternate, petioled, cordate, entire, 5—7-nerved, smooth and shining above, very hoary underneath, sometimes acuminate, sometimes obtuse. Length 3—9 inches, breadth 2—6. In young plants frequently peltate. *Petioles* shorter than the leaves, round, downy. *Umbellets* or heads from the stout, naked, ligneous branches; several from the same bud; on thick, round, downy peduncles of about an

inch in length. *Flowers* numerous, subsessile, villous, obscure-green. *Bractes* of the umbellets obscure; of the flowers, three to four, reniform, villous, pressed close to the calyx. *Perianth* three-leaved: *leaflets* oval, small, very downy on the outside, persistent. *Petals* three, ovate-oblong, acute, downy on the outside, much longer than the calyx, persistent. *Filaments* six, small, short, sterile, embracing the base of the pistil. *Germes* three, very downy. *Styles* slender, recurved. *Berries* (*Drupes*) one to three, nearly round, villous, size of a large filbert, one-seeded. *Seed* as represented by Gærtner. ♂ Yet unknown.

The foregoing description was taken from specimens sent by General Hay Macdowal. R. *Delin.*

It is called by the Singalese *Veni-vell-gettah* or *Bang-well-gettah*: in English, the Knotted-plant. It is in repute among the inhabitants of Colombo, who slice it in thin pieces and swallow it, with the liquid, after steeping it in water several hours. They commend it as an excellent stomachic. *Macdowal.*

The General conjectured that it might be the true Colombaroot. In that guess he was mistaken: but it may not improbably possess like medicinal qualities in a less eminent degree. His Singalese name of it is evidently the same with Gærtner's *Weni wal*. C.

ANAMIRTA.

ANAMIRTA paniculata.

Menispermum heteroclitum. Roxb. *Mss.*

Stem thick, woody, twining or climbing. *Bark* cracked, ash-colour. *Leaves* alternate, petioled, cordate, entire, smooth, deep shining green above, whitish below, 3—5-nerved; with many small distinct tufts of hair upon the nerves on the under-side: 4—6 inches each way. *Petioles* round, smooth, length of

of the leaves. *Panicles* from the naked, woody parts of the stem and large branches beautifully bowing. *Bractes* three-fold, one-flowered, small, caducous.

MALE.

Calyx two-leaved: *leaflets* opposite, oval. *Petals* six; three interior and three exterior, equal, oval. *Nectary* none. *Stamens*, a short, thick, central column, supporting an infinite number of anthers in form of a globe.

FEMALE.

The female flowers have not been found.

Berries as in the genus *Menispermum*: about the size of a ripe black-heart cherry; and, as they are collected in very large pendulous branches, their appearance is most inviting, but their taste is most abominable. R. *Delin.*

TILIACORA.

TILIACORA racemosa.

Menispermum polycarpon. Roxb. *Mss.*

Bagha-lata. *Hind.* Tilia-kora. *Beng.* Tiga-mashadi. *Teling.*

A large, twining, woody shrub, found on the coast of Coromandel in hedges, and in places overrun with bushes. Flowers most part of the year.

Stem woody, twining to great extent. *Bark* ash-colour. *Leaves* alternate, petioled, cordate, pointed, smooth, shining, and frequently scolloped; about five inches long and three broad. *Racemes* axillary, erect: in the male, frequently compound; in the female, simple, few-flowered. *Bractes* minute, caducous. *Flowers* small, yellow. *Calyx* six-leaved; the three exterior leaflets small. *Petals* three, oblong, many times larger than the calyx, spreading. *Nectary* six-leaved: *leaflets* obcordate, clawed, about the size of the calyx. ♂ *Filaments* six, subulate, erect, alternately shorter, nearly the length

of the corol. *Anthers* ovate. ♀ *Germ*s above, about twelve in a circle, each ending in a short, subulate style. *Stigma* simple. *Drupe*s or *Berries* many, short-pedicelled, clubbed, smooth, red, about the size of a French-bean. *Nut* one- or two-celled. R. *Delin.*

From the figure as well as the description, it appears that the female flowers exhibit no rudiments of stamina or barren filaments.

REFERENCES TO TAB. VI.

FIG. 1. *Cocculus incanus*.

2. ———— *sepium*.

3. ———— *crispus*.



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