Qualities. — Juniper berries have a peculiar, aromatic odour, and a sweetish pungent bitterish taste when chewed. In distillation with water they yield a volatile terebinthinate oil of a greenish colour, on which their virtues depend.[1] Both water and alcohol extract their active properties. Their principal constituents are mucus, saccharine matter, and volatile oil.

Medical properties and uses. — Juniper berries are diuretic and cordial. They have been long known as a remedy in hydropic affections; but they cannot be depended on alone, although they form an excellent adjunct to foxglove and squill. The tops are also used; and as the virtues of the berries depend on the essential oil, which is found in the woody part also of the plant, they must be equally efficacious. They have been recommended in scorbutic and cutaneous affections; and Rosenstein asserts that a strong decoction of them soon clears the hands in scabies. The berries are sometimes given in substance, triturated with sugar or some neutral salt; but the best form is that of infusion, made with ℥iij of the berries bruised, and Oj of boiling water. The dose of the first preparation is from ℈j to ʒſs; that of the infusion, a tea-cupful every three or four hours.

Officinal preparations. *Oleum Juniperi.* L. E. D. *Spiritus Juniperi compositus.* L. E. D.

KINO. *Lond. Edin. Dub.* Kino.

Syn. Gomme de Kino (*F.*) Kinoharz (*G.*) Chino (*I.*) Tumble hōan. (*Tam.*)

Although the Edinburgh College has inserted kino as the inspissated juice of the *Eucalyptus resinifera* in the list of materia medica of its pharmacopœia, and the Dublin College has considered it as the product of the *Butea frondosa*; yet we believe that the plant which yields the best kino is an African tree; and from a specimen sent home by Mungo Park in his last journey, which is in the possession of Sir Joseph Bankes, it is a Pterocarpus. It is nevertheless true that kino, such as was brought from Botany Bay about twenty years ago, is the production of the above species of Eucalyptus, the brown gum-tree of that country[2]; but it differs in several of its qualities

[1] The flavour and diuretic properties of Hollands depend on this oil. English gin is flavoured by oil of turpentine.

[2] This plant belongs to the 1st order of the 12th class of the Linnean system. It is a lofty tree, exceeding an English oak in size; and bearing yellowish flowers in umbellated clusters. The calyx is hemispherical, perfectly entire in the margin, and afterwards becomes the capsule; on its top just within the margin stands a pointed calyptra, of the same colour as the calyx, and as long. This calyptra, which is the essential mark of the genus, is analogous to the corolla in other plants, but neither splits nor divides; on removing it a great number of red stamens appear, standing in a conical mass, very resinous, aromatic, and bearing small red anthers. In the centre is a simple style terminated by a blunt stigma, and rising from a transversely cut trilocular germen. The quantity of juice obtained from incisions made into the wood of the trunk amounts sometimes to sixty gallons from one tree. See *White's* Voyage, 231

from the kino described by Dr. Fothergill, who introduced this remedy into practice.[1] We are informed none of it has been brought to this country since the above period. Another sort is said to come from Jamaica, and is stated by Dr. Duncan junior, to be the extract of the *Cocoloba uvifera*, or Sea-side grape[2]; while Mr. Murray says, "he has been informed that it is the extract of the wood of the mahogany."[3] The Dublin College indicated the *Butea frondosa* on the authority of Dr. Roxburgh; but the red juice which this plant yields has been examined by Dr. Duncan, and found to differ very considerably from kino, although it may be used as a substitute for it. The kino now found in the shops comes from India. It is imported in chests containing from one to two cwt. and on the inside of the lid of each chest is a paper, inscribed with the name of John Brown, the month and year of its exportation; and stating that it is the produce of Amboyna.

Qualities. — 1. *Kino* which was given to me as a specimen of true *African Kino*, is inodorous, and insipid when first taken into the mouth; but after some time it imparts a slight degree of roughness, with a scarcely perceptible sweetness, to the palate; feels gritty between the teeth when chewed, and does not colour the saliva. It is in very small, irregularly shaped, shining, deep-ruby-brown-coloured fragments, and intermixed with small twigs and minute bits of wood, which are white in the inside. It is pulverulent, affording a dark chocolate or reddish-brown powder. Water at 60° dissolves the larger moiety of it, and gives a brick red rather turbid infusion, which does not become clear after standing twenty-four hours. Alcohol dissolves nearly two-thirds of it, the tincture having a very deep brown colour: what remains undissolved is nearly colourless. Ether takes up about one-third; and the tincture, which is of a beautiful claret colour, when evaporated on the surface of water-leaves a pellicle of brittle brown resin; while a sweetish red-coloured extractive matter remains dissolved in the water.

2. *Botany Bay kino* is inodorous; tastes bitterish and more austere than the African; is in larger fragments, equally brittle, breaking with a glassy fracture; of a chocolate hue, and affording a brown-coloured powder but it is not uniform in appearance, some of the fragments being of a lighter hue. Water at 60° dissolves nearly the same quantity as of the former variety, and the infusion is brown and transparent. Alcohol dissolves rather more than two-thirds of its weight, but the tincture is not so deep coloured as that of the former variety,

1 *Medical Observations and Inquiries by a Society of Physicians in London*, i. 238. 243.
2 *Edinburgh New Dispensatory*, 5th edit. 292.
3 *System of Mat. Med. and Pharmacy*, ii. 304.

Ether takes up $\frac{1}{20}$th; a pale brownish straw-colour only is imparted to it; and when evaporated on water, the resinous pellicle is scarcely perceptible, and very little extractive is deposited.

3. The *Kino* said to have been brought from Jamaica, but of which none is now to be procured, is in bitterness and roughness nearly equal to the last variety, but these qualities are accompanied with a slight degree of acidity. It is in brittle fragments of an almost black colour, having a shining, resinous fracture, in which appear small air-bubbles. The powder is of a reddish-brown colour. With alcohol and ether it affords results very similar to those of the first variety. Water dissolves a greater portion of it than of the other two kinds, and forms an infusion intermediate in colour and transparency; approaching in colour to the first, and in clearness to the second variety.

4. *East India* or *Amboyna Kino*, is inodorous, very rough, and slightly bitter when first taken; but it afterwards impresses a degree of sweetness on the palate. It is in small uniform, deep brown, shining, brittle fragments, which appear like portions of a dried extract broken down; being perfectly uniform in their appearance. It is easily pulverized, affording a powder of a lighter brown colour than the fragments. Water dissolves two-thirds of it, forming a deep brown clear solution; whilst the portion that remains undissolved, is long suspended, if mixed with a fresh portion of water. Alcohol dissolves the greater part of this variety, forming a deep claret-coloured tincture, which is not rendered turbid on the addition of water. Ether takes up a portion of it, and forms a yellowish red tincture, which, when evaporated on water, leaves no resinous pellicle.

The following Tables show the result of some experiments with several chemical re-agents on the watery infusions of these three varieties of kino.[1] They point out the distinctive features of the four varieties I have enumerated; but they have no pretensions towards advancing the knowledge of the chemical properties of kino.

[1] The specimens subjected to these experiments I have reason to think were perfectly genuine. The African kino was brought home twenty years ago.

TABLE I. Precipitates formed in the Aqueous Solution of Kino, by Gelatine and Solutions of some Metallic Salts.

Variety of Kino.	Solution of Isinglass.	Solution of Oxysulphate of iron.	Solution of Nitrate of Silver.	Solution of Oxy-muriate of Mercury.	Solution of superacetate of Lead.
1st.	copious, slowly formed, of a brick red colour.	copious, quickly formed, of a dirty olive black.	copious, slowly formed, of a deep reddish brown.	not very copious, slowly formed, reddish.	copious, flocculent, quickly formed, brown.
2d.	copious, almost instantly formed, of a pink colour.	very slowly formed, of a deep brownish black.	copious, quickly formed, of an olive black.	copious, quickly formed, yellowish pink.	copious, flocculent, quickly formed, lilac.
3d.	scanty, slowly formed, of a pinkish colour.	copious, quickly formed, of a blue black.	copious, quickly formed reddish brown.	scarcely altered.	copious, flocculent, quickly formed, brownish lilac.
4th.	The same as No. 1.	copious, and dirty olive black.	copious, and quickly formed reddish brown.	quickly formed, reddish.	the same as No. 1.

TABLE II. Precipitates formed by Solution of Potash and Acids.

Variety of Kino.	Potash.	Sulphuric Acid.	Nitric Acid.	Muriatic Acid.
1st.	none, but renders it clear and of a deep brown colour.	copious, pale brown.	scanty, slowly formed; reddish yellow.	scanty, slowly formed, yellowish brown.
2d.	flocculent, purplish.	copious, deeper brown.	copious, quickly formed, yellowish brown.	scanty, more quickly formed, pale red brown.
3d.	flocculent, brownish purple.	very copious, very deep brown.	copious, brown.	scanty, quickly formed, a beautiful red.
4th.	the same as No. 1.	copious, pale brown.	copious, quickly formed, brown.	quickly formed, yellowish brown.

From these experiments there appears to be a considerable difference between three of the four varieties of kino known in commerce, but the first and fourth appear to be nearly the same. The most remarkable differences are, the small portion of resin which that from Botany Bay and Amboyna contain; the blue colour of the precipitate of the Jamaica variety by the oxysulphate of iron; and the effect of the solution of potash in rendering that from Africa transparent, while it precipitates the 2d and 3d varieties. The predominant principles in all the varieties are tannin and extractive matter; and the portion of resin in the 1st and 3d varieties enables ether to take up their colouring matter and some extractive, whilst the second variety is scarcely affected by it. Dr. Duncan[1] and Vauquelin[2] observed, that although heat increases the solvent power of water over kino, yet that a substance insoluble either in water or alcohol always remains. Vauquelin also found that the solutions form a precipitate with tartarized antimony and salts of iron.

The best menstruum is diluted alcohol.

Medical properties and uses. — Kino is a powerful astringent. Like catechu it is employed in obstinate chronic diarrhœas, uterine and intestinal hæmorrhagies, and fluor albus; but as it is less certain in its qualities than catechu, it is less used. Externally it has been applied as a styptic, and to give tone to, and diminish the ichorous discharge of, flabby ill-conditioned ulcers.

It may be exhibited internally in substance, or in the form of watery infusion, or of tincture. The dose in substance is from grs. x. to ʒs. In ordering the infusion or tincture, it is necessary to recollect that solutions of isinglass, sulphate of iron, nitrate of silver, muriate of mercury, superacetate of lead, tartarized antimony, the alkalies, and the strong acids, are incompatible in prescriptions with kino.

Officinal preparations. *Tinctura Kino.* L. E. D.

LACTUCA. *Spec. Plant. Willd.* iii. 1523.

Cl. 19. *Ord.* 1. Syngenesia æqualis. *Nat. ord.* Compositæ semiflosculosæ *Linn.* Cichoraceæ *Juss.*

G. 1404. *Receptacle* naked. *Calyx* imbricate, cylindrical, with a membranous margin. *Pappus* simple, stipitate. *Seed* even.

Species 1. L. *Sativa.* Garden Lettuce. *Blackwell. t.* 8.

[1] LACTUCA SATIVA.

Species 12. L. *virosa.* Strong-scented Lettuce. *Med. Bot.* 2d *edit.* 75. *t.* 31. *Smith Flora Brit.* 819.

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[1] *Nicholson's Journal*, vi. 234.

[2] *Annales de Chimie*, xlvi. 321. Vauquelin states generally that the salts of iron precipitate kino green; but Dr. Duncan justly observes, that by the red sulphate it is precipitated black: the sulphate only precipitates it green.