

XVI.—*Note on Aricine.*

By DAVID HOWARD.

DR. HESSE, in his paper on the cinchona alkaloids, in the *Annalen der Chemie und Pharmacie*, clxvi, f. 259, a translation of which is published in the *Pharmaceutical Journal*, vol. iv, 750, calls attention to the very unsatisfactory state of our knowledge of aricine, the very existence of which he is inclined to doubt.

At the time when Pelletier (*J. Pharm.*, 1829, f. 565), Manzini (*ibid.*, 1842, f. 95), and Winkler (*Repert. Pharm.* [2], xxxi, 294; xlii, 25, 231-3, [3], 1, 11) wrote on the subject, the barks containing aricine appear to have been plentiful in commerce; but the importers, finding them utterly valueless, have never, as far as I can learn, repeated the experiment of importing them, and thus, unfortunately for science, it is impossible to obtain a sufficient supply of the bark to make a satisfactory investigation of the alkaloid.

It seemed, however, so desirable to obtain some fresh light on the subject, that although the quantity of the aricine-yielding bark, *Cinchona pelleterana* (Wedd), which still remained in the collection of my uncle, J. E. Howard, F.R.S., was too small to give much hope of a sufficient supply of alkaloid for a full investigation, he placed a large portion of it at my disposal, and I have carefully examined it; and though I am unable to decide the composition and properties of the alkaloid contained in it, I can at any rate say with considerable certainty that it is perfectly distinct from any other of the cinchona alkaloids.

The bark yields a large quantity of quinic acid, differing in no respect from that of the other cinchonæ, and a small quantity of quinine, undistinguishable from that already known, yielding quinovic acid by treatment with hydrochloric acid gas; but I failed to obtain any trace of cincho-tannic acid or cinchona-red; it also contains an intensely yellow colouring matter, little soluble in water, but freely soluble in spirit, to which it gives a beautiful green fluorescence.

The study of the alkaloid presents special difficulties; solutions of the crude alkaloid change very rapidly when exposed to the air, the colour speedily deepening from pale yellow to dark brown, and the

quantity of material at my disposal did not enable me to complete the purification; but when the alkaloid was obtained approximately pure, all the distinguishing reagents for the well-known cinchona alkaloids were carefully applied, and proved it to be different from any of them. It is scarcely possible that any impurity should have so masked their properties as to prevent their being recognised, if present. The alkaloid is freely soluble in ether; solutions of its salts give no sign of crystalline precipitate on the addition of sodio-potassic tartrate. The iodide is moderately soluble in water, and will not crystallise either from aqueous or from spirituous solutions. The sulphocyanate is very slightly soluble in water, and the solution does not yield any alkaloid crystallisable from ether; the platinum salt also dissolves with difficulty in water. We may therefore pretty confidently assert that neither quinine, quinidine, cinchonidine, cinchonine, nor quinamine is present, while the constitution of the platinum salt, of which I shall speak below, and the property possessed by the pure alkaloid of crystallising from ether, sufficiently distinguish it from quinicine or cinchonicine, and the amorphous alkaloid usually contained in cinchona bark.

On the other hand, the gelatinisation of the solution of the sulphate, described by Pelletier, is very well marked, even in dilute solutions, but I failed to obtain the sulphate crystallised from spirit that he describes. The addition of nitric acid, or of a nitrate, throws down a yellow precipitate from solutions of these salts; this may be owing to the presence of paricine.

A small quantity of the pure alkaloid, prepared by my uncle in 1847, which he had preserved, gives me the opportunity of adding an observation of the optical properties, which are also distinctive. A solution in alcohol of 90 per cent. showed a specific rotatory power of  $63^\circ$  for the yellow ray.

A portion of this alkaloid gave a platinum salt, which lost 4.63 per cent. of water at  $105^\circ$ , it then gave on ignition 13.88 per cent. of platinum; some of my own preparation precipitated cold by platinum chloride from a solution in hydrochloric acid, gave a salt, which, when dried at  $100^\circ$ , gave 13.93 per cent. of platinum; to another portion the platinum chloride was added when the solution was boiling; it showed signs of decomposition, and a considerable quantity of a resinous precipitate separated, and after filtration a salt was deposited on cooling, which gave, dried at  $100^\circ$ , 16.16 per cent. of Pt. This last number most nearly agrees with the percentage 16.31 given by Manzini for the platinum salt of cinchovatine.

The wide divergence of these results from those given by the platinum salts of quinine and its congeners is very remarkable, and points to an altogether different constitution of the salt, strongly confirming the opinion that the alkaloid is distinct. It is hardly to be doubted that

the authors who have already described this body are right in taking this view.

The properties of the alkaloid, as well as the composition of the platinum salt, tend to show that it belongs to the interesting, but comparatively little known group of alkaloids comprising paricine and berberine, and it is most probable that more than one is contained in the aricine barks.

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