

## NOTES ON MYRTICOLORIN.

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[Read before the Royal Society of N. S. Wales, December 1, 1897.]

IN a paper<sup>1</sup> read before this Society on the 4th August last, I announced a true dye material found existing in the leaves of the "Red Stringy Bark," *Eucalyptus macrorhyncha*, Having found by the preliminary examination that the material belonged to the quercetin group of natural dyes, I named it myrticolorin, believing it to be the first possible commercial dye-stuff obtained from the natural order Myrtaceæ. In the abstract of the paper published by the Society, it is stated that "it can be obtained in abundance and with a minimum of trouble, and hence its discovery may be of commercial importance."

The object of the present notes is to amplify the above with the following statements :—

- (a) That myrticolorin is a glucoside of quercetin.
- (b) That it is to be obtained in large quantities.
- (c) That the mode of extraction is extremely simple.
- (d) That in this product Australia has a material of great value, and probably able to successfully compete with quercitron bark from *Quercus tinctoria*, and fustic.

We will consider these statements in the above order.

(a) That myrticolorin is a glucoside of quercetin is proved by the fact that on boiling in dilute sulphuric acid it breaks up into quercetin, proved by its reactions, particularly its acetyl derivative, and a sugar or sugars belonging to the glucoses, this being readily fermented by yeast, reduces Fehling's solution on heating, is sweetish in taste and partly crystallises from water in microscopic transparent prisms, probably monoclinic. It therefore differs

<sup>1</sup> On the Saccharine and Astringent Exudations of the "Grey Gum," *Eucalyptus punctata*, and on a product allied to aromadendrin.

from rutin obtained from Rue (*Ruta graveolens*), the sugar from that substance being rhamnose.

After making the announcement to the Society, I forwarded a small quantity of myrticolorin, and quercetin obtained from it, to Mr. A. G. Perkin in England, who is so well known as an authority on the natural yellow dyes; he informs me that myrticolorin is certainly a glucoside of quercetin, and that it is quercetin is proved by the formation of acetyl quercetin melting at  $189 - 191^{\circ} \text{C}$ . He also suggested that from its greenish tint it might be identical with rutin; the greenish tinge, however, is not constant, it being wanting in some material I obtained later when this was entirely purified from water. To Mr. Perkin for the assistance so readily given me, and also for his advice and promised help towards making the product commercially known, I wish to tender my sincere thanks.

(b) That it is to be obtained in large quantities is indicated by the extent of the range of this species of Eucalypt, it extending over a large portion of this colony and Victoria; and particularly from the fact that the dried leaves contain no less than ten per cent. of myrticolorin. This is the result of quantitative determinations on material obtained from near Rylstone in this colony. As myrticolorin contains from forty-eight to fifty per cent. of quercetin, the actual content of quercetin in the dried leaves may be taken as near five per cent. As only this substance is of use for dyeing purposes, the value is of course judged on the amount of quercetin present.

(c) That the mode of extraction is exceedingly simple may be understood when it is stated that all that is required is to carefully dry and powder the leaves, boil the powder in water and pass the boiling liquid through a filter cloth. As the water cools the yellow substance crystallises out, and when cold it is again filtered through a cloth, the yellow myrticolorin remaining behind while the tannic acid and other substances in solution pass away. The myrticolorin can then be washed with clean water, pressed,

and dried, and if desirable powdered. If required it may be purified by dissolving again in boiling water before drying and treating as before. It is most necessary to powder the leaves, as by so doing the extraction is more complete and much quicker, and the finer the powder the more satisfactory the yield. When whole leaves are boiled, little of the material is obtained. As myrticolorin is not very readily soluble in water, even on boiling, it will be necessary to use a good quantity of water; three extractions appear to be sufficient to remove the whole of the substance providing the leaves are finely ground.

(d) That in this product Australia has a material of great value can be readily seen when we consider the commercial importance of quercitron bark and fustic. Quercitron bark is worth in England £6 10s. per ton, and fustic £4 10s. per ton. The quantitative content of quercetin in quercitron bark has not, it appears, yet been determined, but Mr. Perkin thinks it to be about two or three per cent., and when we consider the difficulty of grinding bark in comparison with dried leaves, and the increased percentage of quercetin in the leaves of this Eucalypt, the advantages in favour of eucalyptus leaves are apparent. If the yield of quercetin is taken at three per cent. in quercitron bark, that equals 67 lbs. quercetin per ton, while one ton of dried leaves of *E. macrorhyncha* would give 224 lbs. of myrticolorin, or over 100 lbs. of quercetin.<sup>1</sup> It appears, therefore, that the prospective value of these eucalyptus leaves is very good, and at present they are put to no use whatever. Myrticolorin, too, is easily obtained in comparison with the preparations from quercitron bark. The manufacture of flavin (a dried extract from this bark) appears to be somewhat complicated, and the use of chemicals must necessarily increase the cost of production, while the preparation of myrticolorin can be carried out practically without capital, the only outlay necessary beyond the utensils usually found upon a small homestead being a mill

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<sup>1</sup> Myrticolorin contains seven per cent. of water, it probably crystallising with three molecules of water.

for grinding the leaves ; the best form of cheap mill will no doubt be forthcoming. Iron utensils for the extraction must not be used.

Although in this industry as in many others, superior advantages are to be gained by carrying out the extraction on a large scale, yet, there is no reason why it should not be done in a small way also. Myrticolorin when dried is not liable to change, so that it is an ideal material for collection and export. The quantity of this class of dyestuffs used annually must be very great, although I have been unable to obtain definite information on that point, but in the Board of Trade Journal for 1894, page 474, it is stated that the export of fustic alone from Mexico, known in that country as "palo-moral" or "palo-amarillo," reaches 9,000,000 kilogrammes a year. This is exported to England, France, and Germany.

It is not to be expected that *E. macrorhyncha* is the only Eucalypt containing myrticolorin in payable quantities in the leaves, and it would be well to bear this substance in mind in future experiments with eucalyptus leaves. It appears necessary for the formation of myrticolorin in the leaves that they be carefully dried, no heating or fermentation being allowed. A few pounds of myrticolorin will now be obtained and forwarded to England for experiment. My thanks are due to my colleague at this Museum, Mr. R. T. Baker, for botanical assistance in the determination of the species.

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