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MADRAS RECORD OFFICE.

Government of Madras.

Revenue DEPARTMENT.

G.O. No. 1760	Press ~~Mis.~~
422-423	
Dated 19th June 1869	

Not to be folded or roughly handled

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Proceedings of the Madras Government, Revenue Department,
19th June 1869.

No. 422. Read the following letter from J. W. BREEKS, Esq., Commissioner of the Neilgherries, to the Acting Secretary to Government, Revenue Department, Fort Saint George, dated Camp at Coonoor, 26th April 1869, No. 13:—

I HAVE the honor to forward Mr. Broughton's Report upon some Chinchona Barks, and to request that he may be permitted to correct the Printer's proof of the report as on a former occasion, and that Government will furnish him with a dozen printed copies of the report for his own use.

2. The results of subsequent analyses of the bark of the new kind of Chinchona tree, which Mr. Broughton brought to the notice of Government in his report embodied in Proceedings of the Revenue Department of 22nd September 1868, No. 334, are highly satisfactory.

3. Mr. Broughton's remarks, as to the desirability of Government covering still larger tracts of land with the C. Succirubra, seem worthy of consideration. As Government have a distinct and independent object in their Chinchona Plantations apart altogether from the object of private growers, and as the C. Succirubra, (as remarked by Mr. Broughton,) is thoroughly established here, and has a wide geographical range, it would seem a good and a profitable thing if the Superintendent's attention were directed to experimental cultivation and to the propagation of those varieties which practical tests prove to be of the highest value, rather than to the extension of plantations of those varieties which we know to be inferior to others, and of which we have plenty.

From J. BROUGHTON, Esq., Quinologist to Government, Ootacamund, to the Commissioner of the Neilgherries, dated Ootacamund, 24th April 1869.

I HAVE the honor to communicate the following facts connected with the Government Chinchona Plantations. The considerations suggested by these, appear to me to be of importance, and I therefore make a separate communication on the subject.

2. On a previous occasion* I had the honor to mention the occurrence of a variety (or perhaps a species) of Chinchona, whose bark surpassed in quality that of any kind previously known. The number of these trees is unfortunately not great. A search over the plantations has brought to notice about a dozen of various sizes; some quite equalling in vigor the trees of *C. Officinalis*; but others decidedly smaller, and less vigorous in growth.

3. During the last six months I have naturally paid much attention to these trees, and made repeated anlyses of their bark. I am led in consequence to attach even a greater value to the kind than at first. I quote the principal numerical results I have obtained, expressed in per-centages of the dry bark. To compare with these, and to avoid all chance of ascribing to the merits of the species what might possibly be due to other unperceived causes, I made analyses in each case of their nearest crown bark neighbours of about the same size. The latter are marked β.

* Proceedings of the Madras Government, Revenue Department, 22nd September 1868, No. 334, paras. 11—13.

4. I.—A good specimen 9½ feet high, and equal in size to an average tree of *C. Officinalis* of same age.

	New kind.	β.
Total alkaloids	11·40	3·95
* Total sulphates obtained crystallized	10·51	3·32
Quinine	9·75	1·55
Chinchonidine and a small amount of Cinchonine	1·65	2·40
Quinine sulphate obtained crystallized	10·13	1·50
Chinchonidine sulphate	0·38	1·82

5. II.—A tree of same age, but smaller size—

	New kind.	β.
Total alkaloids	11·50	4·52
Total crystalline sulphates obtained	10·10	undetermined.
Quinine	7·00	2·42
Chinchonidine, &c., ...	4·5	2·10
Quinine sulphate obtained crystallized	6 75	undetermined.
Chinchonidine sulphate obtained crystallized	3·35	do.

6. III.—Bark from two healthy trees about eight and a half feet high.

	New kind.	β.
Total alkaloids	8·10	4·45
Total sulphates obtained crystallized	7·52	undetermined.
Quinine	7·25	2·03
Chinchonidine, and traces of Cinchonine	0·85	2·42
Quinine sulphate, obtained crystallized	7·37	undetermined.
Chinchonidine	0·15	do.

7. IV.—Bark from two small trees, five feet in height.

	New kind.	β.
Total alkaloids	5·61	1·85
Quinine	3·26	1·05
Chinchonidine, and Cinchonine	2·35	0·80
Sulphate of Quinine, obtained crystallized	3·30	undetermined.

* Exclusive of Cinchonine sulphate which, however, would be of very small amount,

8. V.—Bark from several trees about four feet high growing at high elevations, healthy, but not vigorous.

	New kind.	β.
Total alkaloids	4·45	1·45
Quinine	2·41	undetermined.
Other alkaloids	2·04	Do.

9. The foregoing analyses abundantly show the remarkable quality of the bark. In all cases the yield of alkaloid from the bark of trees of this lanceolate-leaved kind greatly exceeds that of the Crown barks growing under the same external conditions. Analyses I. and III. are of bark from vigorously healthy trees, and the alkaloids consist almost entirely of *quinine*. The amount is unprecedented, far exceeding that of any Chinchona bark hitherto known. Indeed, the yield of No. I. is three-fold that of fine Bolivian Calisaya. Even this scarcely gives an accurate idea of the value; for the alkaloid is contained in a third of the bulk of material; and hence, both the cost of carriage, and the labor, and proportionate cost of the process of obtaining the alkaloid in a commercial form, is practically reduced. The effective practical value of Chichona bark really increases in a greater ratio than the yield of alkaloids. Rich bark is cheapest to manufacture quinine from.

10. The bark of the above specimens was of capital appearance, and its alkaloids yield crystalline sulphates with much ease. There being no reason to suppose that the cost of the growth of this variety will exceed that of the Crown-barks; it may fairly be predicted that bark of the quality of No. 1. specimen, yielding a tenth of its weight of sulphate of quinine, must ultimately produce great changes both in Indian Chinchona cultivation, and in the European market.

11. I have pointed out to Mr. McIvor, Superintendent of the Plantations, the great importance of the variety. He is now taking steps for its rapid propagation. I feel convinced, that the cultivation of this remarkable variety, if it be appropriately followed up, will greatly enhance the present success of the plantations. It would be well worth while to have a considerable plot of ground planted with these trees under "high cultivation."

12. Feeling desirous of some corroboration of my results with this bark, I forwarded a small parcel of it to my friend and correspondent, Mr. J. E. Howard of Stratford. I am glad to learn from him that the numbers he obtained in the analyses he was kind enough to undertake, closely coincide with mine. He says that the kind appears to him to be *suigeneris*, and unlike any he has in his possession. He obtained ten per cent. of crystalline sulphates, the greater part of which he found to be quinine. He hopes to be able to trace its affinities with the help of Mr. Cross, who brought over the seeds among those of the Crown barks.

13. As a matter of personal opinion, I have long felt much doubt of the expediency of the haste with which the whole amount of land that is intended to be devoted to Chinchona cultivation is being planted out. Such rapidity will, I fear,

leave little scope for the improvements, that must eventually follow from the systematic study of the plants, and their products. The benefit that would accrue by applying the results of a fuller experience to the future extension of the plantations will have little chance of being felt, if all the work be now done in the light of our present knowledge. The energy which has covered large tracts of land with Chinchona trees and shrubs, has placed the undertaking beyond risk; sufficient has been planted for all present use, and it appears to me to be unwise to limit the future to our present measure of success by leaving so little room for future extension.

14. The above opinion, which I have ventured to express, seems also to be corroborated by some collateral considerations. It is proposed to plant, during the forthcoming season, two lacs of plants of *C. Succirubra*. This tree possesses several advantages, is of quick-growth, and produces bark of good yield; but is not by any means, nor will be, the best species possible. The million and a quarter trees we already possess should, I think, be enough of it. Moreover, *C. Succirubra* appears to succeed well in most places where it could rationally be tried. Private plantations here are filled with it. It succeeds well in Wynaad, Coorg, the Himalyas, Travancore, Ceylon, and other parts of India. Great hopes are anticipated of the success of the Jamaica plantations of red bark, and private plantations of the same are succeeding well on the slopes and crests of the Organ mountains in Brazil. It has also been introduced into Madeira, and Algeria. From these facts it appears worth considering, whether it be desirable to have so large a quantity planted by Government, especially when it is recollected, that there are other species which have a still higher reputation in Europe. The true *C. Calisaya*, hitherto the most esteemed of all the Chinchonas, is in our possession, and the seeds of the valuable C. Pitayensis have been received from South America. Both have yet to be fairly tried.* Would it not be well to see how these and other matters turn out before the whole amount of land is planted?

No. 423.

ORDER THEREON, 19th June 1869, No. 1,740.

Miscellaneous.

THE Right Honorable the Governor in Council fully concurs with the Commissioner in considering that in the future extension of the Chinchona Plantations, special attention should be paid to the varieties to which Mr. Broughton refers. The Commissioner should issue the necessary instructions to the Superintendent of the Plantations.

(True Extract.)

Acting Secretary to Government.

To the Commissioner of the Neilgherry Hills.
,, the President of the Chinchona Commission.
,, the Board of Revenue.

Ed. E. C. Shunker.

* Though the trees of C. Calisaya are small, I have been able to obtain bark for analysis, grown on the Neddivattum plantations. The trees were two years old. The per-centages of alkaloid in the dry bark were :—

Total alkaloids...	3·66
Quinine...	1·38
Chinchonidine and Cinchonine	2·28
Total sulphates obtained crystallized	2·72
Sulphate of Quinine obtained...	1·22
Sulphate of Chinchonidine obtained	1·50

The results from so young a tree are promising; but as there appear to be very many sub-varieties of the species, it would be unsafe to generalize from a single analysis. The bark was undoubtedly that of the true Calisaya. In this instance there seems to be the tendency to produce Chinchonidine, which marks most of our Indian barks.

Proceedings of the Madras Government, Revenue Department
May 1869.

No. . Read the following letter from J. BROUGHTON, Esq., Quinologist to Government, Ootacamund, to the Commissioner of the Neilgherries, dated Ootacamund, 21th April 1869 :—

I HAVE the honor to communicate the following facts connected with the Government Chinchona Plantations. The considerations suggested by these, appear to me to be of importance, and I therefore make a separate communication on the subject.

2. On a previous occasion* I had the honor to mention the occurrence of a variety (or perhaps a species) of Chinchona, whose bark surpassed in quality that of any kind previously known. The number of these trees is unfortunately not great. A search over the plantations has brought to notice about a dozen of various sizes; some quite equalling in vigor the trees of *C. Officinalis*; but others decidedly smaller, and less vigorous in growth.

3. During the last six months I have naturally paid much attention to these trees, and made repeated anlyses of their bark. I am led in consequence to attach even a greater value to the kind than at first. I quote the principal numerical results I have obtained, expressed in per-centages of the dry bark. To compare with these, and to avoid all chance of ascribing to the merits of the species what might possibly be due to other unperceived causes, I made analyses in each case of their nearest crown bark neighbours of about the same size. The latter are marked *β*.

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	New kind.	β.
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5. II.—A tree of same age, but smaller size—

	New kind.	β.
Total alkaloids	11·50	4·52
Total crystalline sulphates obtained	10·10	undetermined.
Quinine	7·00	2·42
Chinchonidine, &c., ...	4·5	2·10
Quinine sulphate obtained crystallized	6·75	undetermined.
Chinchonidine sulphate obtained crystallized	3·35	do.

* Proceedings of the Madras Government, Revenue Department, 22nd September 1863, No. 334, paras. 11—13.
† Exclusive of Cinchonine sulphate which, however, would be of very small amount.

6. III.—Bark from two healthy trees about eight and a half feet high.

	New kind.	β.
Total alkaloids	8·10	4·45
Total sulphates obtained crystallized	7·52	undetermined.
Quinine Chinchonidine, and traces of Cinchonine...	7·25 0·85	2·03 2·42
Quinine sulphate, obtained crystallized Chinchonidine	7·37 0·15	undetermined. do.

7. IV.—Bark from two small trees, five feet in height.

	New kind.	β.
Total alkaloids	5·61	1·85
Quinine Chinchonidine, and Cinchonine	3·26 2·35	1·05 0·80
Sulphate of Quinine, obtained crystallized	3·30	undetermined.

8. V.—Bark from several trees about four feet high growing at high elevations, healthy, but not vigorous.

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Total alkaloids	4·45	1·45
Quinine Other alkaloids	2·41 2·04	undetermined. Do.

9. The foregoing analyses abundantly show the remarkable quality of the bark. In all cases the yield of alkaloid from the bark of trees of this lanceolate-leaved kind greatly exceeds that of the Crown barks growing under the same external conditions. Analyses I. and III. are of bark from vigorously healthy trees, and the alkaloids consist almost entirely of *quinine*. The amount is unprecedented, far exceeding that of any Chinchona bark hitherto known. Indeed, the yield of No. I. is three-fold that of fine Bolivian Calisaya. Even this scarcely gives an accurate idea of the value; for the alkaloid is contained in a third of the bulk of material; and hence, both the cost of carriage, and the labor, and proportionate cost of the process of obtaining the alkaloid in a commercial form, is practically reduced. The effective practical value of Chichona bark really increases in a greater ratio than the yield of alkaloids. Rich bark is cheapest to manufacture quinine from.

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Revenue Department.

No. 1740.

PROCEEDINGS of the MADRAS GOVERNMENT.

Under date the 19th June 1869.

Read the following letter from the Commissioner Nilgherries.

Forwarding Wm Broughton's report upon some Chinchona Barks with remarks, and requesting that the Quinologist may be furnished with a dozen printed copies of the Report.

(H.E. 26th April 1869 No. 13)

1740

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