and gets dry. Of all the plant saps examined coconut tree juice has been found to be the richest source of ascorbic acid. The quantity of juice yielded by date palm and palmyra palm trees daily is also quite considerable, so that the ascorbic acid excreted is very high. It was noted that the ascorbic acid content did not suffer any change even after spontaneous fermentation for 24 hours.

Further details and the transference of ascorbic acid from the water into the kernel according to age of the fruit etc. will appear in the *Transactions of the Bose Research Institute*.

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## The Cultivation of *Artemisia*.

FOR some time past attention has been directed to the cultivation of *Artemisia brevifolia* from seeds obtained from the santonine yielding varieties of the Kurram Valley (N.W.F.P.) and the Kashmir, with a view to raising the santonine content of the wild species. It has been reported, elsewhere,* that the Kurram *Artemisia* grows well in Dehra Dun, as a garden plant, but the plants divide themselves in two sub-forms designated as the $x$-form and the $y$-form ; the only distinction between the two being that one produced the flower heads early in June and the other did not show any flower heads till late in the year. It was consequently suggested that the one flowering late was the original form and the earlier flowering variety was the acclimatised form. Similar growth has been noted in the case of the Kashmir *Artemisias*. During the first year some of the plants started flowering early (May-June) and the others did not flower till November suggesting again the original and the acclimatised form. Both the Kashmir and the Kurram Valley *Artemisias* have now well established themselves and the later observations have revealed the fact that instead of the two forms stated above there is only one, but that it produces flower heads twice a year and consequently has two periods of maximum santonine content, namely, June and December. The hope that the santonine content would rise on cultivation has, however, not yet been realised. The above observations are rather interesting from the point of view of cultivation of the drug and are therefore reported. The table given below gives the santonine content of the samples collected from the minor forest products gardens of the Forest Research Institute.

| Time of collection weeks | | | Santonine percentage | Remarks |
|---|---|---|---|---|
| 4, | August | 1933 | 0·60 | Young leaves only |
| 4, | October | 1933 | 0·79 | Buds only |
| 1, | December | 1933 | 0·91 | Leaves and buds |
| 1, | January | 1934 | 0·78 | ,, ,, |
| 1, | February | 1934 | 0·12 | ,, ,, |
| 1, | March | 1934 | 0·66 | Fresh leaves |
| 1, | April | 1934 | 0·80 | Luxuriant growth but no buds |
| 1, | May | 1934 | 0·84 | ,, ,, |
| 1, | June | 1934 | 0·85 | Buds making appearance |
| 3, | June | 1934 | 0·98 | Buds |
| 1, | July | 1934 | 0·52 | Early rains dropped the buds |
| 1, | August | 1934 | 0·22 | ,, ,, |
| 4, | August | 1934 | 0·62 | Fresh young leaves |

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* Krishna and Varma, *Quarterly Journal of Pharmacy and Pharmacology*, 1933, **6**, 23.

## Czapek's Synthetic Medium.

CZAPEK'S formula for synthetic medium has been in use for over thirty years for culturing fungi. It consists of nitrate, phosphate, sulphate and chloride in addition to the organic principle, which is sucrose. It has, from time to time, been modified to suit the requirements of individual workers. In 1910 Dox modified this formula to present in a nearly neutral solution unaffected by sterilisation the elements necessary for the fungous growth. The original formula contained acid potassium phosphate ($KH_2PO_4$), while in this modified one Di-potassium hydrogen phosphate ($K_2HPO_4$) was used to obtain a neutral solution. Previous to this Dox[2] had used the original formula in a modified form with different proportions of the constituent salts. Currie[3] in 1917 used acid potassium phosphate for *Aspergillus niger*.

During the preparation of Czapek's solution as modified by Dox it was frequently noticed that the addition of ferrous sulphate solution gave traces of milkiness, while the latter formula, according to which acid potassium phosphate was used, gave a clear solution as reported by Thom.[1]

On being heated to a high temperature in the autoclave, the milky product settles down as a bulky precipitate. The precipitate consists of magnesium phosphate with traces of iron. Thom[1] and later, Thom and Currie[4] have also noticed traces of precipitated magnesium phosphate.

In this note an attempt is made to study the chemical reactions of the constituent inorganic salts and the effect of the high autoclave temperature on the reactions. One per cent. solutions of pure salts in distilled water were used.

Magnesium sulphate and di-potassium hydrogen phosphate react only at the boiling temperature, when magnesium precipitates as the phosphate. The presence of sodium nitrate alone or with potassium chloride has no effect on the reaction. But the presence of ferrous sulphate even in traces has its part in the reaction and iron is also precipitated along with magnesium even at the ordinary temperature as well as at the boiling or autoclave temperature.

Magnesium sulphate and sodium nitrate or potassium chloride in the absence of di-potassium phosphate do not give a precipitate either at the ordinary temperature or on boiling, even when potassium chloride is present. But when ferrous sulphate is present, slight milkiness is produced, which, on boiling, disappears. When subjected to the high temperature in the autoclave ferric oxide is precipitated.

Ferrous sulphate reacts with di-potassium phosphate at the ordinary temperature even in the absence of magnesium sulphate or potassium chloride and gives a precipitate of ferrous phosphate.

Sodium nitrate and ferrous sulphate do not give any precipitate but in presence of potassium chloride some milkiness is produced which disappears on boiling.

Even in aqueous solution ferrous sulphate changes at the temperature of the autoclave into ferric oxide.

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*June* 13, 1935.

[1] Thom, C., *U. S. Dep. Agr., Bur. Anim. Indust. Bull.*, 1910, **118**, 22.

[2] Dox, A. W., *U. S. Dep. Agr., Bur. Anim. Indust. Bull.*, 1910, **120**, 37.

[3] Currie, J. N., *J. Biol. Chem.*, 1917, **31**, 29.

[4] Currie, J. N., and Thom, C., *J. Biol. Chem.*, 1915, **22**, 289.

## Sterility of Crop-Plants and a Study of Their Root-System.

STERILITY in crop-plants is fairly well known indeed: it, therefore, does not need any special elucidation. Suffice it to mention that the phenomenon is attended with abundant vegetative growth and as a consequence the sterile plant or branch, in habit looks bushy (Figs. 3 and 4). Studies based on *Trifolium alexanderinum* L. (berseem),[1]

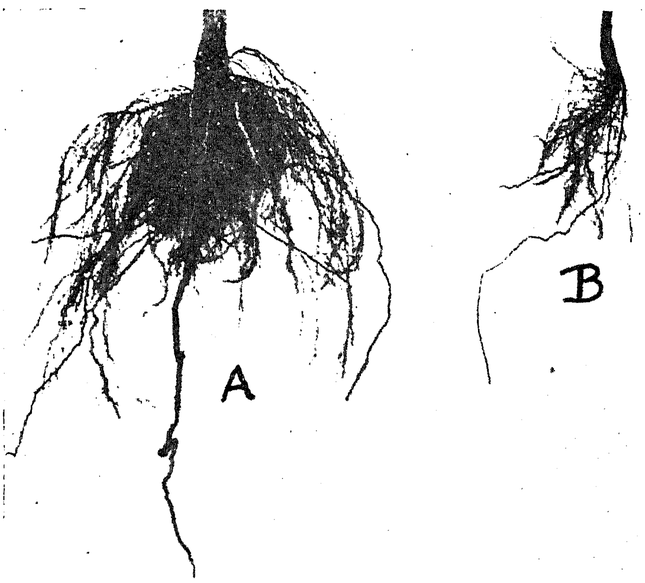


Fig. 1.
*Sesamum indicum* Linn. A—root-system of a healthy plant; B—root-system of a sterile plant. × 1/6.

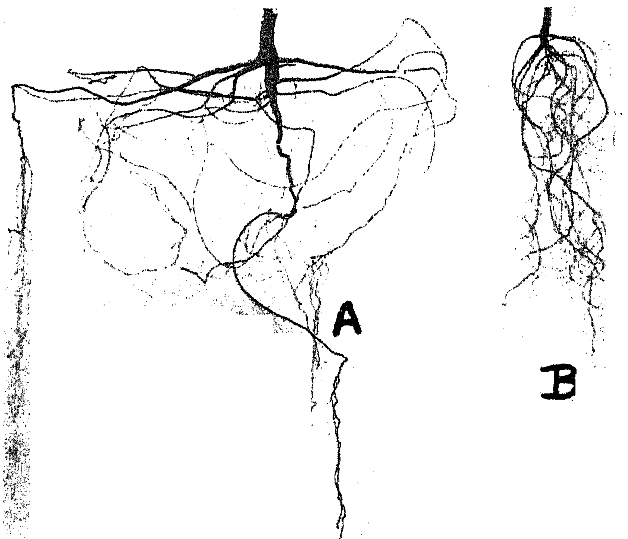


Fig. 2.
*Cajanus indicus* Spreng. A—root-system of a healthy plant; B—root-system of a sterile plant. × 1/20.