For systematic study of the effect of incubation on Costus rhizomes we grew, in our garden, plants from rhizomes collected from Khandala hills in Maharashtra. Rhizomes harvested from plants 60 days old 22" tall on 11–8–1977, giving very high increase in diosgenin content on incubation, is reported in this short communication.

Thin slices of freshly collected rhizomes were incubated with water and dilute solutions of growth regulator for 24 hours at 37° C and then analysed by the colorimetric method of Akira Akahori[6] and modified by Patel[7]. Results of this experiment are given in Table I. The table shows that the diosgenin content

TABLE I

*Diosgenin content of Costus speciosus rhizomes on moisture free basis*

| Procedure | Per cent diosgenin | Per cent increase over control |
|---|---|---|
| 1. Fresh tuber without incubation (control) | 1·366 | |
| 2. Incubation with water | 3·503 | 156·44 |
| 3. Incubation with 2 ppm IAA | 3·234 | 136·74 |
| 4. Incubation with 20 ppm IAA | 3·725 | 172·69 |
| 5. Incubation with 200 ppm IAA | 4·460 | 226·50 |
| 6. Incubation with 1 ppm GA | 3·234 | 136·74 |
| 7. Incubation with 10 ppm GA | 3·195 | 133·89 |
| 8. Incubation with 100 ppm GA | 3·946 | 188·87 |
| 9. Incubation with 1 ppm 2 4-D | 4·081 | 198·75 |
| 10. Incubation with 10 ppm 2, 4–D | 4·235 | 210·02 |
| 11. Incubation with 100 ppm 2, 4–D | 5·050 | 269·69 |

IAA = Indole 3-acetic acid, GA = Gibberellic acid, 2, 4–D = 2, 4 dichloro phenoxy acetic acid.

1·3% in the control increases to 3·5% with water incubation and to 5·0% on incubation with 2, 4–D. The Maximum increase in yield is 270% over the control.

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## ANTHRACENE DERIVATIVES IN LEAVES AND FRUITS OF *CASSIA ALATA*

*Cassia alata* (Family—Ceasalpinaceae) is a native of tropical America but is now widely distributed in the tropics *e.g.* in Western and Eastern Africa[1]. It is a soft wooded shrub up to 15 feet high. The fruits of this plant consist of a pod of up to 6 inches long containing 30–60 seeds.

Reduced anthraquinone compounds are reported to be present in leaves[2] and quinone pigments[3] in roots of *Cassia alata*. Laxative action of leaves has been confirmed by animal experiments[4]. The perusal of literature has revealed that there is no report on active constituents of fruits of this plant. In view of cathartic values of anthraquinones, both leaves and fruits of *Cassia alata* were systematically examined for the presence of anthraquinone compounds.

*Experimental*

Anthracene derivatives isolated from leaves and fruits of *Cassia alata* are listed in Table I.

TABLE I

*Nature and concentration of anthraquinones compounds isolated from leaves and fruits of* Cassia alata

| | Free oxidised aglycones | % w/w dry wt. | Aglycones (present as glycosides) | % w/w dry wt. | Total % w/w dry wt. |
|---|---|---|---|---|---|
| Leaves | Aloe emodin | 0·1 | Rhein<br>Aloe emodin | 0·1 | 0·2 |
| Fruits | Rhein<br>Aloe emodin<br>Emodin | 0·3 | Rhein<br>Aloe emodin<br>Emodin | 1·0 | 1·3 |

Procedures for extraction of free and combined anthraquinones from leaves and fruits of *Cassia alata* were similar as *Cassia siamea*[5]. Extracts were examined by thin layer chromatographic processes and separated components were isolated by preparative thin layer chromatography[0]. A colorimetric method[6] was used to esti-

mate the tree and combined anthraquinones. Results are summarised in Table I. It is concluded that anthraquinones are present relatively in higher quantity in fruits than leaves of *Cassia alata* and hence fruits will exert more laxative action than leaves.

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## DISCOVERY OF *ASCARIS LUMBRICOIDES* OVA IN PERIPHERAL BLOOD OF MAN

LINNAEUS[1] was the first to identify *Ascaris lumbricoides*, the biggest and the commonest round worm resident in human beings. In 1967, the World Health Organisation[2] Expert Committee on control of ascariasis estimated that approximately one out of every four people in the world population is infected with this parasite. However, in a recent survey carried out by Veerannan[3] around Madras, South India, the prevalence of *Ascaris lumbricoides* in a mixed population was found to be 10·62%. Much work on the epidemiology of ascariasis has been done, in view of the impact this disease has on the health of the population. Infection is effected by swallowing ripe eggs of *Ascaris* along with contaminated food or water. Infection may also occur by inhalation of desicated eggs in the dust reaching the pharynx and swallowed. Fertilised eggs measure normally 60–75 $\mu$ by 40–50 $\mu$ and are easily identified by characteristic mammilated albuminous outer layer, with a clear inner shell and the embryo inside, whereas, unfertilised eggs, measuring approximately 80 $\mu$ in length by 55 $\mu$ in bredth are highly irregular, opaque, narrower and eliptical without a definite shape as described by Lysek[4]. A detailed account on some abnormal eggs of *Ascaris lumbricoides* has been given by Matuda[5]. In view of the morphological abnormalities, unfertilised eggs are more difficult for a beginner to identify. It has been estimated by Brown and Cort[6] and Augustine *et al.*[7], that the eggs per gram of faeces for each adult female worm is not less than 2,000.

Though the normal habitat of *Ascaris lumbricoides* is the alimentary tract of man, adult worms and larvae have been found in unusual organs as well as in blood stream (Boettiger & Werne[8], Hotta & Delfim[9], Sprent[10], Phan[11], Costa *et al.*[12], Tiwary and Prasad[13]). However, unfertilsed ova and fragments of *Ascaris* ova were accidentally observed microscopically for the first time, in blood smears while screening the slum dwellers for microfilaria larva. Out of 400 samples of blood smears examined, only 2 contained unfertilised ova along with fragments, whereas, 39 showed the presence of fragments only. This will come as a great surprise to many and will constitute a valuable addition to the existing knowledge of Medical Parasitology.

The occurrence of unfertilised ova of *Ascaris* in blood was further confirmed by examining the stool samples of the suspected cases, during an intestinal parasitic and filarial survey of slum dwellers in Saidapet and Guindy in Madras, South India. In stool samples, unfertilised ova occurred along with fertilised ova in more than 75% of the positive cases, whereas, fragments and unfertilised ova alone were observed in blood smears examined for microfilaria larva. The unfertilised ova were without albuminous capsule and were identical with those illustrated by Keller[14].

On examining the available literature, it was found that so far there is no record of occurrence of *Ascaris* ova in the peripheral blood of man. In order to eliminate the possibility, that the occurrence of fragments and unfertilised ova in blood smear might be due to contamination of the left hand fingers, (from which blood samples were first collected by pricking with sterilised needle), blood samples were also collected by pricking the right hand finger as well as from the "cubital" vein. As was done earlier, thick and thin smears were prepared and stained with eosin. Microscopic examination of the blood samples collected both from the right hand fingers and the "cubital" vein also showed the presence of fragments and unfertilised *Ascaris* ova as illustrated in Fig. 1.

During the cycle of development of *Ascaris* in man, as described by Stewart[15], the larvae liberated by the hatching of the embryonated eggs in the small intestine are known to penetrate into portal circulation. After a brief sojourn in the liver, they pass through the right heart into the lung and undergo further development in the capillaries from there they pass to the air vesicles, up the trachobranchial tree, down the oesophagus into stomach and small intestine, where they develop into adult worms. Phan[11] observed *Ascaris* eggs in various stages of development in liver and he believed that adult *Ascaris* migrating from the inten-