there is a decrease in nitrogen content with increase in body weight. These values compare favourably with the values reported in other lamellibranchs like *Ostrea edulis*, *Mya arenaria*, *Pecten irradiatus*, and *Venus mercenaria* which were found to have a nitrogen value of 2·11%, 2·18%, 2·36% and 2·67% respectively (Payen[3]; Atwater[4]). Similarly, Balland[5] found 1·8% of nitrogen in the living matter of *Mytilus edulis* and Atwater (1892) found 1·56% in *Crassostrea virginica*. Srinivasan[6] has reported a nitrogen value of 2·56% in *Martesia fragilis* and 3·19% in *Martesia striata*. In *Donax* the non-protein nitrogen is much less, ranging from 0·7 to 1·04%. The mean values for non-protein nitrogen and total nitrogen are 0·90% and 2·59% respectively, the ratio of the two being 1 : 2·88.

From this, the calculated value for protein nitrogen is 1·69%. The total protein content calculated from this value is 10·53%, similar to the protein values in other bivalves. In *Ostrea edulis* the protein content ranges from 8·6 to 12·6%, in *Mytilus edulis* 8·9 to 11·7%, *Mytilus munahuensis* 11·3 to 19·4%, *Enoplochiton niger* 24·7%, *Pecten maximus* 17·5% and in *Cardium edule* it is 13·2% (Reviewed by Borgstrom,[7] 1962). In *Martesia fragilis* the protein content varied from 3·5 to 11·5% (Srinivasan, 1961). The protein content of *Donax cuneatus* which ranges from 9·44 to 11·25% is thus found to be comparable with the values obtained for other lamellibranchs.

Donax occurs in large numbers in our sandy shores. It is also used as a source of food by the poorer section of the people. Even though the protein content is generally less in bivalves than in fishes (8·8–23·8%) or Crustaceans (9·4-15·3%) they form a supplemental item in the food. Since *Donax* occurs in very dense populations they may perhaps be exploited to a greater extent than now.

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DIURNAL VARIATION IN CHLOROPHYLL CONTENT OF LEAVES OF GROUNDNUT PLANTS (*ARACHIS HYPOGEA*)

THE controversy relating to continuous changes in chlorophyll content throughout the life of the leaf due to destruction of chlorophyll molecules in darkness and their regeneration in light was revived recently by Godnev *et al.*[1] Earlier, Wendel[2] observed large diurnal fluctuations in chlorophyll content and suggested the existence of diurnal rhythm for the same. Seybold[3] contradicted Wendel's views and doubted the correctness of his data. Virgin[4] noted that in young leaves protochlorophyll, precursor to chlorophyll *a* (a major component of total chlorophyll), is formed throughout the 24 hours but during daytime it cannot be isolated as it is immediately converted to chlorophyll *a*. Recently Wickliff and Aronoff[5] carried out a detailed study of the problem with an elaborate statistical lay-out and concluded on the basis of statistical analysis of their data that the mature leaves of soybean plants showed, if at all, a negligible variation of 1% in the chlorophyll content during a period of 24 hours thus proving the lack of diurnal variation. They however pointed out the possibility of its existence in young leaves which would need verification by measurements which eliminate the influence of biological variations. Keeping in view this precaution, the present investigation was carried out on relatively young leaves (second open leaves from the shoot-tips) of groundnut (TMV-2) plants.

Beginning at 7-00 a.m. on a clear day, samples (by punch method) were taken at random in triplicate at 3-hour intervals till next morning from the central portion of the proximal leaflets of the second leaf on the main shoot of 45 days old uniform plants, raised in pots kept in the open. Throughout the experiment one plant was sampled only once. Each of the three samples for each time of observation was immediately analysed for the total chlorophyll content according to Arnon's method,[6] using Bausch and Lomb 'Spectronic 20' colorimeter. The data are represented in the graph and also examined

statistically by the method of Analysis of Variance.

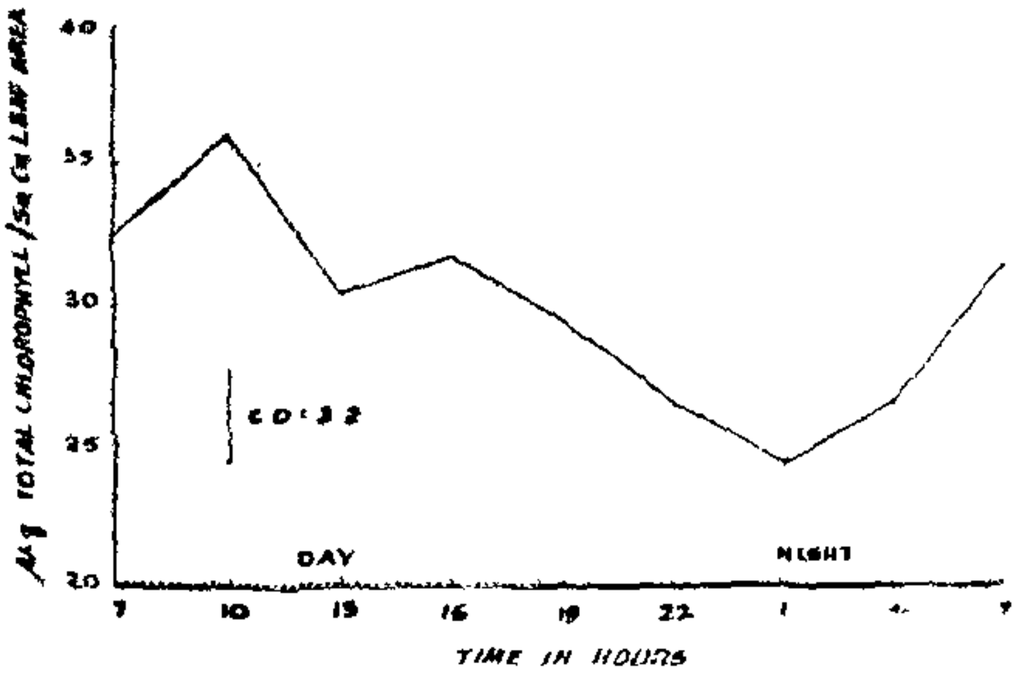

FIG. 1

The chlorophyll content increased rapidly in the morning, reached a maximum value of 36·2 μg. per unit leaf area (1 sq. cm.) and went down gradually to a minimum of 24·5 μg. at 1-00 a.m. It is thus in close agreement with the conclusion of Virgin[4] that young leaves show a maximum accumulation of protochlorophyll at about midnight which is rapidly converted to chlorophyll after sunrise.

Analysis of variance

Source of Variation	D.F.	Sum of Squares	Mean Sum of Squares
Time ..	8	310·12	38·76
Linear regression ..	1	120·10	120·10
Deviation from Linear ..	7	190·02	27·15
Residual error ..	18	32·51	1·81

The 'analysis of variance' shows high significance ($P < 0·01$) for differences among the mean values for the 'times of observation'. With the 'critical difference' of 3·2 μg. for $P < 0·01$, it is seen that the 'day' values are significantly higher than the 'night' values, except for the intermediate value at 7-00 p.m. The statistical significance of the linear regression may also indicate the linear fall in the chlorophyll content from morning to midnight. The large and significant deviation from linear regression, which could not be reduced to even 50% by removing the polynomial contribution up to 4th degree, is perhaps due to asymmetrical wave nature of the curve. It requires confirmation by carrying out the study over a few days continuously at shorter time intervals and with more replications. Wickliff and Aronoff[5] apparently expected no change in the chlorophyll content throughout the 24 hours of their experimental period and so they considered the 1% variation, although statistically significant, to be of no consequence; the linear regression was significant; but the deviation was very low and so they concluded the absence of diurnal variation in chlorophyll content in the mature leaves of soybean. In the present experiment, the leaves sampled were relatively young and apparently showed diurnal variation.

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MONOCHAETIA TURGIDA (ATK.) SACC. ON *ROSA* SP.—A NEW RECORD FOR INDIA

DURING the mycological survey in the month of January, 1964, some dead twigs of cultivated rose (*Rosa* sp.) were found to be infected with a *Monochætia* sp. at the Government Horticultural Garden, Kanpur. A search of literature revealed no species of *Monochætia* on this host from India, hence further studies were taken up to establish the identity of the fungus.

Morphology of the fungus.—Acervuli dark, scattered or gregarious, discoid, circular, triangular or oblong, bursting out through the epidermis, broken epidermis recurved back and giving star-like appearance, measuring 236·7-2000 × 66·27-236·7 μ; paraphyses numerous, slender and hyaline; conidia fusoid, broadly ellipsoid, unequal-sided or curved, 5-septate, with hyaline or slightly sooty and nearly cone-shaped end cells and hay's brown to light seal brown middle cells, apical hyaline cell of each conidium provided with a hyaline seta, conidia measure 20·43-26·9 × 7·47-10·71 μ.

The diagnostic features of this fungus resemble *Monochætia turgida* (Atk.) Sacc. described by Saccardo[2] and Guba[1] and is identified as such. This fungus is recorded only from America on dead leaves of *Cratœgus* sp. Hence it is the