melting point of which (189° C.) has been correctly recorded by them, for in that case the discrepancy could not have escaped detection. This seems to be all the more unfortunate in view of the fact that Scott and Robinson did not claim that the 2:5-dinitro derivative was the sole product of nitration with potassium nitrate and sulphuric acid, but only the chief product.

The above mode of nitration, using potassium nitrate and sulphuric acid, has now been extended to that of *m*-chloracetanilide. In this case, 4-nitro-3-chloro acetanilide (M.P. 144°C.) was found to be the main product (yield, 54% of theory), whilst if nitric acid alone was employed, as was previously done by Hodgson and Kershaw,[3] a mixture of 4- and 6-nitro-3-chloracetanilides results, entailing a tedious process of separation.

Investigation on this line is being continued and details will be published elsewhere.

Our thanks are due to the Council of Scientific and Industrial Research, India, for a grant which defrayed the expenses of this investigation and for permission to publish the preliminary results. Our thanks are also due to Professor R. D. Desai of the Department of Chemical Technology, University of Bombay, for the kind gift of 100 gm. of *m*-chloraniline hydrochloride.

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August 12, 1948.

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VOLVOX IN NORTH INDIA

To the algologist, the occurrence and distribution of the very interesting green alga, *Volvox*, always has a peculiar fascination. The distribution of this genus in India has still to be fully worked out. It has been so far recorded from a small portion of the country only *viz.*, South India and Bombay Presidency, and practically nothing is known regarding its occurrence in the rest of India; which forms the major portion of the country. Iyengar (1933), in his excellent monograph, on the Colonial Volvocales of South India, has given an account of a number of species of *Volvox* occurring in the area. And Apte (1933) has given an account of a few species of *Volvox* from Poona and its neighbourhood in the Bombay Presidency.

The writer collected a *Volvox* from Lucknow in 1929 and sent it to Professor Iyengar, who described it as a new variety, *V. Rousseletii* West var. *lucknowensis* Iyengar (Iyengar, 1933, pp. 350, 351, 370). Last year, the writer collected in October four more species of *Volvox* within the University area at Lucknow from shallow rain-water pools fully exposed to the sun. These four species occurred each separately in pools which were separated from each other by very short distances, only 30 to 40 yards. Three of these species were identified as *V. globator* (L.) Ehrenberg, *V. Carteri* Stein and *V. africanus* West, respectively, while the fourth species could not be identified owing to the absence of the necessary stages.

Of the four species which were collected by the writer in Lucknow, *V. Rousseletii* var. *lucknowensis* is known so far only from Lucknow. *V. Carteri* was first collected by Carter (1859) in Bombay and described by him under the name of *V. globator*, but was later on established as a new species, *V. Carteri*, by Stein (1878) (see Iyengar, 1933, p. 363). *V. Carteri* has since been recorded from Madras by Iyengar (1933) and from Poona by Apte (1936). And *V. globator* and *V. africanus* have been recorded from Bangalore and from Nandi Hills (Mysore Province), respectively, by Iyengar (1933).

Now the fact that four species (five species, if we include the unidentified one) have been collected within a very small area in a single place like Lucknow suggests that the genus is quite likely to be found in several other parts also of North India, if algologists should be on the look out for this genus in these different parts of the country.

The writer in conclusion wishes to express his indebtedness to Professor M. O. P. Iyengar for his kind help in preparing this note.

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May 15, 1947.

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UROMYCES ACORI RAMAKRISHNAN AND RANGASWAMI SP. NOV., ON *ACORUS CALAMUS* L.

Acorus calamus L. grows well in marshy places and on the banks of lakes in Ootacamund and its neighbourhood. In March 1948 it was found to be infected by a rust. The incidence of the rust was more in shaded localities than in open areas. Both uredial and telial stages were observed. These are described below.

Uredia amphigenous, oval, isolated, sometimes gregarious, 1 mm. in length, erumpent, subepidermal, brown in colour; urediospores, pedicellate, subglobose, elliptical or obovate $24 \times 22\ \mu$ ($22-33 \times 19{\cdot}5-25{\cdot}0$) yellowish brown to reddish brown, echinulate to verrucose, mixed with clavate, subhyaline or hyaline paraphyses.

Telia closely resemble uredia and found mixed with them on both sides of the leaf; teliospores pedicellate, one-celled, ovate to elliptical, $30 \times 21\ \mu$ ($27-36 \times 16-25$) yellowish brown in

colour, with an apical thickening upto 14 μ and single germ pore at the apex, stalks persitent, up to 41×11 μ, hyaline or subhyaline; paraphyses hyaline or subhyaline, clavate, mixed with teliospores.

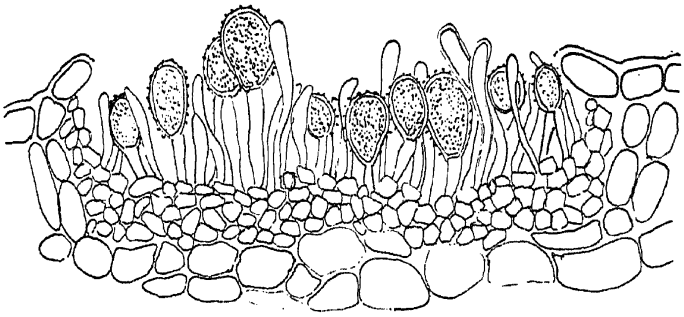

FIG. 1. Section through uredium × 335

On living leaves of *Acorus calamus* L. Ootacamund, 24th March 1948, T. S. Ramakrishnan and G. Rangaswami (type).

Soris uredosporiferis amphigenis, ovalis, isolatis, interdum aggregatis, 1 mm. longis, erumpentis, subepidermis, brunneis; uredosporis pedicellatis, subglobosis, ellipticis vel obovatis, 24×22 μ (22–33×19·5–25·0) echinulatis vel verrucosis, flavo-brunneis vel rubrei-brunneis; paraphysibus numerosis, clavatis, sub-hyalinis vel hyalinis.

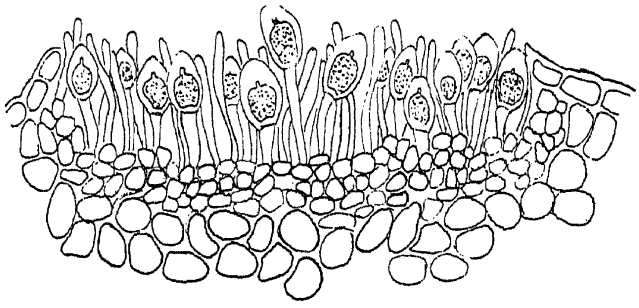

FIG. 2. Section through telium × 160

Soris teleutosporiferis conformibus, uredíis immixtis, amphigenis; teleutosporis pedicellatis, unicellatis, ovatis vel ellipticis 30×21 μ (27–36×16–25), flavo-brunneis, apice incrassatis, usque 14 μ, poris germinationis 1, pedicelli persistenti, hyalini vel subhyalini, usque 41×11 μ, paraphysibus clavatis, subhyalinis vel hyalinis.

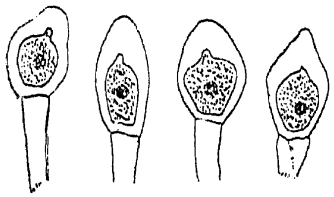

FIG. 3. Teliospores. × 335

In vivis foliis *Acori calami* L. Ootacamund, 24th March 1948, T. S. Ramakrishnan et G. Rangaswami.

Raciborski (Saccardo, 1902) has described *Uredo acori* on *Acorus terrestris* Spreng. from Java. Sydow, H. and P., and Butler (1906) have noticed the same rust on *Acorus calamus* from Gauhati, Assam; and Uppal *et al* (1934) have recorded it on the same host from Poona, Bombay. The rust under study has the uredial stage closely resembling that of *Uredo acori* Rac. already recorded, in spore shape and size though in the description of the fungus by Saccardo no mention is made of the presence of paraphyses. An authentic specimen was kindly supplied by Dr. M. K. Patel from Poona and paraphyses were noticed in this. The uredial stage of the rust under study is found to be identical with *U. acori*. The perfect stage of the fungus has now been observed. The telia and uredia are mixed together and occur on the same leaf. Therefore they are considered to belong to the same rust. The telial phase of the fungus shows it to be *Uromyces* and the rust is named as *Uromyces acori*.

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June, 23, 1948.

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PISTILLODY IN SACCHARUM

FROM among the graminaceous plants occurrence of pistillody has been recorded by Anthony[1] and Leighty and Sando[4] in wheat. Isolated instances of pistillody were noticed at this Station by Dutt and Krishnaswami[2] in a few spikelets of the varieties Taboe Woelong and Shamsara as also in a seedling of Glagah × Co. 331, but in the instance recorded below pistillody seems to be a feature or a characteristic of this particular seedling and occurs in all the inflorescences and in all spikelets. The pistil parent of this seedling is *S. spontaneum*, L. (Uganda) which in itself is peculiar among *spontaneums* in that according to Dutt and Krishnaswami[3] it is protogynous.

During the flowering season of 1945-46, an instance of abnormality involving partial or complete transformation of the stamens into processes bearing stigmatic hairs was noticed in a hybrid seedling G. 5023. The malformation was noticed in all the arrows and in each and every spikelet and in all cases all the three stamens were affected, though variation was met with in the degree of transformation of the stamens.

In the upper portion of the arrow, there was complete transformation of the stamens into carpels. The extreme case was wherein all the three stamens were transformed into carpels. In structure these had a membranous ovary-like sac at the bottom with one or two stylar branches having feathery stigmatic hairs (Fig. 3). These bore no resemblance to stamens and could be judged to be transformed stamens only from their positions. In other cases, half of the anther was transformed into carpel while the other half retained its shape, though the contents in the sac were only a pulpy mass. In the transformed portion there