month of June, it was found that these cells had developed into akinetes with thick stratified walls and contents of a homogeneous nature (Fig. 9).

Rhizoids.—Rhizoids usually arise from the cells of the prostrate system (Figs. 2 and 5). In some cases it was found that the lower cells of the projecting system were directly prolonged into long rhizoidal cells (Fig. 10). In some cases the rhizoids are 1–2 celled, while in others, they are fairly long many-celled structures. Rhizoids are so closely attached to brick-particles, that it is very difficult to detach them. When first examined they escaped notice, as they get mutilated when the alga is scraped. Upper cells of the rhizoids usually contain fragments of chloroplasts, while lower cells are usually hyaline.

Some of the cells of the projecting system were found empty, and an apical cell was found ruptured (Fig. 8), possibly due to the escape of zoospores. However no zoospores were actually observed by the author.

Aplanospores.—In some cells of the projecting system, it was seen that the contents had rounded off into spores which may be described as aplanospores. May be these are arrested zoospores which have developed thick walls, as seen in certain species of *Œdogonium*.

In its structural organization *Iwanoffia* stands midway between *Stigeoclonium* and *Fritschiella*, and marks an important stage in the conquest of land by algal pioneers.

M. S. Randhawa.

2, Park Road,
Allahabad,
September 18, 1940.

Occurrence of *Sclerospora graminicola* (Sacc.) Schroet. on *Setaria verticillata* Beauv. in Allahabad

Among the downy mildews *Sclerospora graminicola* (Sacc.) Schroet. is well known in India as the cause of the green ear disease of bajra (*Pennisetum typhoideum*) which, according to Mitter and Tandon[1] may damage up to 45 per cent. of the plants in low-lying fields in Allahabad. Butler and Bisby[2] record this parasite on only one other host, *viz.*, *Setaria italica*, besides bajra. We have observed this fungus growing on *Setaria verticillata* Beauv. in a shady plot in the University Botanical Gardens and we believe it has not been recorded before on this host in India. So far only the conidial stage has been found. Amongst the plants growing in the garden most of the leaves are attacked. The infected areas soon turn brown and wither. A detailed description of the parasite on this host will shortly follow.

J. H. Mitter.
A. K. Mitra.

Department of Botany,
University of Allahabad,
September 7, 1940.

[1] Mitter, J. H., and Tandon, R. N., *Journ. Ind. Bot. Soc.*, **9**, 243.

[2] Butler and Bisby, *The Fungi of India*, 1931, p. 7.

Note on Sorghum Stapfii. C.E.C. Fischer

Sorghum Stapfii. C. E. C. Fischer is a wild grass native to India. Hooker[1] described it as *Andropogon Stapfii.* Index Kewenisis Supplt. II (1886–1900) gives this plant the status of an independent species. Gamble[2] classified it under the genus *Sorghum.* This plant has not been mentioned by Snowden[3] in his "Cultivated Races of Sorghum".

The chromosome number of this plant as counted in meiosis is $n = 10$. The meiosis is regular. The chromosomes are rather small.

It is interesting to note that *S. Stapfii* easily hybridizes with *S. sudanense* Stapf. and in the progeny of the hybrid segregations occur for both types of plants. *S. sudanense* as also *S. arundinaceum* Stapf., *S. verticelliflorum* Stapf. and *S. œthiopicum* (Hack) Ruper. ex Stapf. are considered by Snowden (*l. c.*) to be primarily concerned in the evolution of the cultivated sorghums. *S. sudanense* hybridises easily with cultivated sorghum [*S. dochna* Forsk. Snowden and also with *S. virgatum* Stapf. Snowden (*l. c.*)] *S. Stapfii* thus forms yet another wild sorghum with which *S. sudanense* hybridizes easily,

It seems reasonable therefore that *S. Stapfii* should find a place in the series *Spontanea* of the Sub-Section *Arundinacea*, of Snowden.

N. KRISHNASWAMY.
G. N. RANGASWAMI AYYANGAR.
Agricultural Research Institute,
Coimbatore,
September 17, 1940.

[1] Hooker, J. D., *Flora of British India*, 1897, **7**, 184.
[2] Gamble, J. S., *Flora of Madras*, 1934, **10**, 1735.
[3] Snowden, J. D., *The Cultivated Races of Sorghum*, 1936.

On the Natural History of *Rastrelliger kanagurta* (Russell) with Special Reference to its Spawning Season and Eggs.*

THE first description of the South Indian mackerel was by Russel in his *Fishes of Vizagapatam*[1] published in 1803. As his name '*Kanagurta*' was an adaptation from the vernacular, many of the subsequent authors adopted Rupell's specific name 'microlepidotus'. Jordon and Dickerson[2] in 1908 distinguished the chub-mackerel *Rastrelliger* with its deeper body, larger scales, feebler dentition and feathery gill-rakers from the typical mackerel and established the genus *Rastrelliger* for it. As the South Indian mackerel presents these characters, it should be included in the genus *Rastrelliger*. As Russell's names have now been generally accepted, we have called the common South Indian mackerel *Scomber microlepidotus* of Day, *Rastrelliger kanagurta* (Russell).

According to H. W. Fowler[3] this species is widely distributed in the Indo-Pacific region. On the West Coast of the Madras Presidency the seasonal fishery of this fish is of great economic value, and ranks next only to that of *Sardinella longiceps*, the Indian oil-sardine. The statistics collected by the Madras Fisheries Department show that, in a good season like that of 1928–29, as much as about 21 lakhs of maunds (= 75,267 tons) of this fish valued approximately at 27 lakhs of rupees is taken on the coasts of the Malabar and South Kanara Districts (250 miles). The fishery usually commence in August and continues to the end of May; it reaches its peak in October, November and December. As the mackerel taints quickly, the quantity consumed in the fresh condition is not considerable; the great bulk of the catches is cured and the product exported to the interior districts in India and to Ceylon and Singapore. The fishery is subject to great fluctuations as the mackerel fisheries elsewhere in the world. In some years the abundance of the mackerel seems to coincide with the scarcity of the oil-sardine and *vice versa*. As both are plankton-feeders, it is obvious that they both compete for food in a mutual struggle for existence and otherwise affect each other's welfare in a manner not yet intelligible. Over 5,000 specimens have been examined from 1934.

Size: Specimens of this mackerel less than 10 cm. in length have not been met with in the catches examined. 25 cm. is the maximum length to which this fish grows on the west coast as recorded by Day.[4] The fish attain maturity at about a length of 19 cm. The size forming the bulk of the commercial catches varies from 20 cm. to 23 cm.

Food: The diet of this mackerel consists entirely of plankton. The following organisms have been found in its stomach contents.

Zooplankton: (1) Copepods chiefly *Paracalanus* sp., *Euterpina* sp., *Acartia* sp., and *Oithona* sp.; (2) Larval bivalves; (3) Evadne; and (4) Larval prawns.

Phytoplankton: (1) *Coscinodiscus* chiefly *C. jonesianus*, *C. oculosiridis*, *C. gigas* var. *dioramma*, and *C. jonesckii*; (2) *Peridinians* — *P. depressum* and *P. ovatum*; (3) *Fragilaria*; (4) *Ceratium*—*C. tripos* and *C. massiliense*; (5) *Thalassiothrix nitzschioides*; (6) *Nitzschia* sp.; (7) *Asterionella japonica*; (8) *Rhizosolenia*; (9) *Pleurosigma*; (10) *Dinophysis homunculus*; (11) *Biddulphia sp*; (12) *Planktoniella*; (13) *Ceratulina*; and (14) *Tintinnus*.

Its European relative, *Scomber scombrus* is said to include in its dietary small sprats and pilchards.[5] Till now no vertebrate material has

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