

molecular silver gave diethyl 1-4-diketo-2-3-dimethyl cyclohexane-2-3-dicarboxylate (III). Clemmensen reduction of (III) followed by hydrolysis gave desoxycantharidin (IV). Reduction of (III) by aluminum isopropoxide followed by etherification and hydrolysis by sulphuric acid gave cantharidin (I), m.p. 217°. Mixed m.p. of the synthetical cantharidin with an authentic sample from *Mylabris pusiulata*, kindly supplied by Dr. P. C. Guha (Indian Institute of Science, Bangalore) to whom our thanks are due, was also 217°. Further details will be published shortly.

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### CLAVICEPS PURPUREA (Fr.) Tul. AND A NEW SPECIES FROM SIMLA

PUSHKAR NATH AND PADWICK<sup>1</sup> recorded the presence of ergots on grasses at Simla, the hosts including *Brachypodium sylvaticum* Beauv. and *Oplismenus compositus* Beauv.

The fungus producing ergots on *Brachypodium sylvaticum* is *Claviceps purpurea* (Fr.) Tul.

A large number of *Brachypodium* ergots was found germinating in nature immediately below the plants at Simla on August 9th, 1942. These ergots measured 1.6 × 16 (1.4 - 2.0 × 7 - 35) mm. The stromata were purple or brownish yellow, slightly pitted or tuberculate, borne on a purple or brownish-yellow stipe, measuring up to 1.5 × 28 mm. The globose to subglobose capitula measured 2.8 (1.5-3.0) mm., and the ovate perithecia 147 × 259 (119-170 × 246-280) μ, asci 2.6 × 125 (2.4-3.6 × 81-173) μ and ascospores 98 (81-136) μ.

In 1942 successful attempts were made to inoculate rye and wheat with spores formed in potato dextrose agar cultures of the *Brachypodium* fungus. Ergots formed on rye, and eventually reached a maximum size of 2.5 × 13 mm., and were straight, furrowed, purplish-brown in colour, and hard at maturity. They were in every way typical of *Claviceps purpurea*. Those on wheat were smaller, measuring up to 4 × 10 mm.

In addition to the collection of germinating ergots of *Brachypodium sylvaticum*, a large number of germinating ergots from *Oplismenus compositus* was collected immediately beneath plants of that species on August 22nd, 1942. The ergots measured 1.3 × 6.4 (1.0-1.5 × 4-10) millimetres. The capitula were yellowish-green in colour, tuberculate, borne on a yellow stipe which measured up to 4.2 cm. in length. The diameters of the capitula varied from 1.0 to 1.6 mm. The perithecia measured 203 × 323

(170-229 × 280-357) μ; asci 2.6 × 178 (2.0-3.1 × 148-242) μ; and ascospores 145 (119-188) μ. Conidia found on ergots on the host plant were greenish coloured in mass, giving the sclerotia a greenish hue. Even singly they had a slightly green colour. They measured 3.8-8.4 (3.4-4.6 × 4.2-18.9) μ.

Pure cultures of the *Oplismenus* fungus were repeatedly obtained by surface sterilizing the sclerotia and plating on potato dextrose agar. Slow-growing cultures resulted, consisting of a much convoluted greenish-yellow mass, finally becoming darker green, and consisting largely of masses of spores which were somewhat smaller than those formed on the ergots, namely, 2.4 × 9.8 (1.6-3.8 × 3.3-12.6) μ.

On the basis of spore length, colour of stipe, and particularly the striking green colour exhibited by the fungus in all its stages, it differs from all known species of *Claviceps*, and is regarded as a distinct new species, to which is given the name *Claviceps viridis*.

*Claviceps viridis*, Padwick et Azmatullah,  
sp. nov.

*Sclerotia viridibus vel viride-nigris, cylindraceis, curvatis, 1.3 × 6.4 (1.0-1.5 × 4-10) mm. Stromatibus in quoque sclerotio quotcumque 4; stipitibus cylindraceis, flavis, ad 4.2 cm. longis, 0.5 vel 0.8 mm. diam.; capitulis globosis vel subglobosis, flavide-viridibus vel fuscis, tuberculosus, 1.0 vel 1.6 mm. diam. Peritheciis ovalis, ostiolatis papillaribus, 203 × 323 (170-229 × 280-351) μ; ascis cylindraceis, apicibus rotundatis, basibus attenuis, 2.6 × 178 (2.0-3.1 × 148-242) μ; ascosporidiis 145 (119-188) μ longis. Conidiis hyalinis vel palido viridibus globosis vel cylindraceis, strictis vel curvatis, 3.8 × 8.4 (3.4-4.6 × 4.2-18.9) μ.*

In terra, sub plantis *Oplismenorum compositorum* Beauv., leg. Md. Azmatullah, Simla, 25-8-42 (Typus). Statis conidicis et scleroticiis in ovariiis *Oplismenorum compositorum*, leg. Pushkar Nath, Simla, Nov. 1942.

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Research Institute, G. WATTS-PADWICK.  
New Delhi, MD. AZMATULLAH.  
August 9, 1943.

<sup>1</sup> *Curr. Sci.*, 1941, **10**, 488.

### ON THE NEMATODE INDIANA GRYLLOTALPAE, GEN. et. SP. NOV. FROM GRYLLOTALPA SP.

HOST: *Gryllotalpa* sp.  
LOCATION: Gul.  
LOCALITY: Calcutta.

BASIR\* has recently founded four new genera of nematode worms obtained from *Gryllotalpa* sp. in the Aligarh district. At the time of examination of the gut contents of the insect in this laboratory four Oxyurid worms were collected and placed at my disposal. All the specimens except one have unfortunately been mutilated at the time of collection.

The worms collected are all female and small in size. The entire specimen measures 1.7 mm. in length. The lips are inconspicuous, behind which there is a number of broad

cuticular longitudinal appendages directed backwards. The oesophagus ends in a rounded bulb with valvular apparatus. The caudal extremity

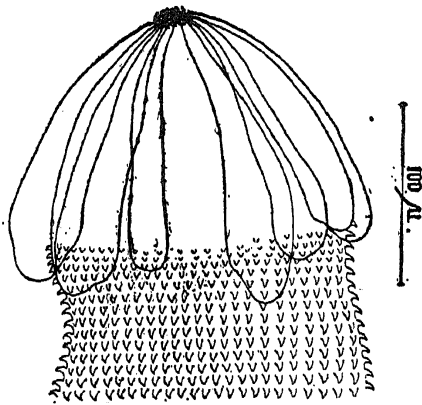


FIG. 1

*Indiana gryllotalpa*. Female. Anterior extremity

terminates abruptly in a narrow spike. The cuticle, except on the caudal spike, is beset with distinct spines arranged in close-set transverse rows. The cuticle on the anterior end also appears to be devoid of spines. The spines are directed backwards and those on the posterior part of the body are larger than others. The eggs are oval and thick-shelled.

The worms under report, however, cannot be identified with any genus founded by Basir, nor with any other known nematode genus, a new genus and a species to accommodate it, appears necessary.

The detailed description of the worm will be published later.

Zoological Laboratory, G. K. CHAKRAVARTY,  
University of Calcutta,  
June 29, 1943.

\* Basir, M. A., *Recd. Ind. Mus.*, Calcutta, 1942, 44,  
Pt. I, pp. 95-106.

### EFFICIENCY OF SOME SAMPLING METHODS FOR WHEAT CROP

SAMPLING saves much time, labour and expense in getting information regarding yield, relative value of different varieties with different manures for crops spread over extensive areas. But the sampling problem is a difficult one, because the method differs from crop to crop, place to place and even from field to field. The sampling procedure depends mainly on the material to be sampled. If the material is homogeneous, the procedure is comparatively simple; but in case it is heterogeneous complicated methods will have to be devised for taking the samples.

It is known that the error variance of the estimated value on the basis of the unit of sampling is  $(1 - \frac{n}{N}) \frac{s^2}{n}$ ,<sup>1</sup> where  $N$  is the total number of units in which the whole area can be divided,  $n$  is the number of units actually sampled and  $s^2$  is the variance between the units.

Again the percentage loss of information due to sampling in any experiment is  $(1 - q) \frac{B}{A} \times 100^2$ ;

where  $q$  is the proportion sampled from each plot,  $B$  is the variance between the sampling units within the plots, and  $A$  is the variance between the plots. The above formulæ show that the efficiency of a sampling method depends on (i) the proportion sampled, (ii) the variance between the sampling units. As the variance between the units depends on their size, the size also should be such as to have a low coefficient of variation for that particular size.

Many workers<sup>3,4</sup> have tried to arrive at the best method of sampling by the aid of the criterion mentioned above. Their conclusions are based mostly on the results of a few experiments from plots ranging from 1/17th to 1/5th of an acre. For rice, Hubback<sup>5</sup> has arrived at some general conclusions from data collected over extensive areas. But no attempt has been made to judge the efficiency of different methods of sampling by any intensive work. In this note we have dealt with the efficiency of a few sampling methods with reference to wheat on the basis of the Karnal wheat uniformity trial data, which has been published in full in a previous publication.<sup>6</sup>

The whole area 1.1478 acres consisting of two thousand 5' × 5' plots (25 rows × 80 columns) was divided into four equal parts or blocks each having five hundred plots (25 rows × 20 columns). From each of these portions sampling was carried out on 1 per cent., 2 per cent., 5 per cent. and 7 per cent. basis by the following three methods: (1) Selecting 5' × 5' ultimate plots at random; (2) forming composite samples of 125 sq. ft. by adding the yields of five ultimate plots selected at random; (3) selecting an area of 125 sq. ft. adjoining and round about an ultimate plot taken at random. Each method of sampling was repeated twenty-five times. It will be noted that the whole area was sampled 300 times (25 samples × 3 methods × 4 percentages).

Tables I, II and III give the mean values of (i) the estimates, (ii) the variances within blocks and (iii) the percentage loss in efficiency with their standard errors based on the twenty-five samplings. Table IV shows the standard error of the differences between the estimated and the actual values on the basis of the standard deviation without taking the blocks into consideration.

TABLE I

Mean of sampling estimates in ounces for 125 sq. ft. for different sampling methods

Method of sampling	1%	2%	5%	7%
1st method	84.6 ± .43	84.0 ± .48	84.4 ± .24	84.4 ± .25
2nd method	83.2 ± .78	84.8 ± .42	84.8 ± .29	86.6 ± .61
3rd method	84.4 ± .63	84.4 ± .71	85.3 ± .45	84.8 ± .37