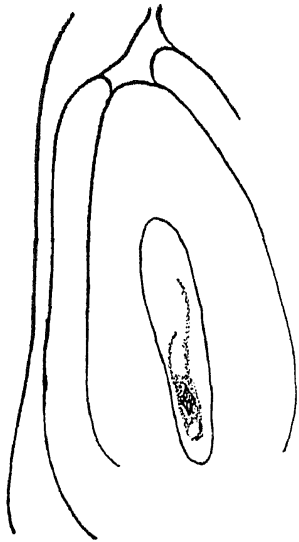


become much elongated and taper towards the cell complex mentioned, probably deriving nourishment from it. Ultimately these cells are crushed by the developing embryo-sac or sacs.

In the one-nucleate stage of the embryo-sac it is seen that the chalazal end elongates into a tubular haustorial process. The nucleus and most of the cytoplasm migrate into it. Usually the nucleus divides in this position (Fig. 2). An



(FIG. 2)

8-nucleate embryo-sac is formed after three successive free nuclear divisions. The antipodals degenerate early. Two or three embryo-sacs are formed in some ovules, a fact noted by Sharma also previously.

In the rest of the plants studied, the archesporium is 1-celled although occasionally two archesporial cells and even two 2-nucleate embryo-sacs in each ovule have been observed in *Klienhowia hospita*. Usually the chalazal most megaspore of the tetrad is functional in these plants but in a few cases of *Klienhowia* and *Waltheria*, the one above the chalazal most is seen to develop further.

In *Pterospermum* species and *Klienhowia hospita* the antipodal end of the embryo-sac remains tubular owing to the presence of a jacket of thick walled cells around it. A hypostase is formed in the basal part of the ovule in *Waltheria indica*.

A fuller account of the floral anatomy, microsporogenesis, and embryo-sac development will appear elsewhere.

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September 12, 1948.

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SPHINCTERED APERTURES IN THE INTERSEGMENTAL SEPTA OF EARTHWORMS

In 1919 Bahl,¹ in the first of his remarkable series of papers describing the enteronephric type of nephridial system in earthworms of the family Megascolicidae, also described *sphinctered apertures* on the intersegmental septa of the three species of *Pheretima*. These apertures have not been found in any other earthworm and in 1930 Stephenson² rightly remarked that, "So far as known, they are confined to genus *Pheretima*." Recently on examining two species of the genus *Drawida* (*D. ghatensis*, and *D. travancorensis*), sphinctered apertures have been found to occur in these earthworms as well, but that their situation is a little different. The septa of this worm are muscular and complete with no apertures on them at all, but there is a thin membrane, connecting the middle of the posterior face of each septum with the muscular bladder of the nephridium lying immediately behind it. It is this connecting membrane which is riddled with sphinctered apertures. I have counted the number of these apertures on eight such membranes and find that the average number is 200 on each membrane. The diameter of the apertures is, on an average, 57 μ, while the average thickness of the sphincter is 15 μ.

In discussing the possible function of these sphinctered apertures on the membranous septa of *Pheretima*, Bahl¹ wrote, "The sphincter muscles round the apertures are *a priori* the means of closing these apertures and thus restricting the flow of the coelomic fluid to particular segmental chambers which leads to a condition of turgidity of these segments and thus makes them stiff for the leverage of setae." In case of *Drawida* apparently this explanation will not hold good, as the sphinctered apertures here do not lie on the main body of the septum, but only on a subsidiary membrane connecting the nephridium with the septum. There is little doubt that this subsidiary membrane supports and keeps the bladder of the nephridium in position. It is possible that the apertures minimise the chances of the membrane preventing a free flow of the coelomic fluid within each segment.

I am thankful to Prof. K. N. Bahl for reading through this note and to Miss S. Mathew and Mr. P. V. Kurian for collecting the two species of *Drawida* from Travancore.

VIDYA VATI.

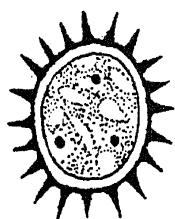
University of Lucknow,
September 15, 1948.

1. Bahl, K. N., *Quart. Journ. Micr. Sci.*, 1919, 64, Pt. 1. 2. Stephenson, J. *The Oligocheta*, 1930, Oxford.

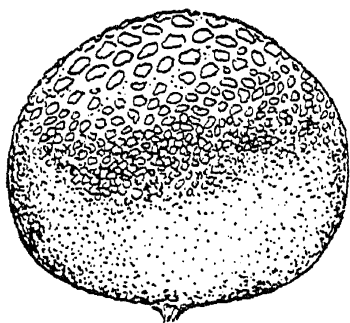
A TRUFFLE (*TUBER* SP.) FROM KODAIKANAL HILLS (MADRAS)

TRUFFLES are highly prized in Europe as a delicate article of food, they are found in California also; fruit-bodies of truffles are dug up underground because they normally grow 3-12 inches below the surface of the soil; they emit a characteristic odour and are located by the aid

of specially trained dogs and pigs, whose keen scent enables them to spot these underground fruit-bodies right. The particular odour is not evident to most human beings. *Tuber* species occur commonly in deciduous forests of North Italy, France, Germany and other places in Europe. The mycelium of some species of *Tuber* has been recorded in France by late Prof. P. A. Dangeard in 1894² as a mycorrhizal symbiont with roots of various trees, especially oaks and beeches and some conifers; other species are true saprophytes. Truffles come under Ascomycetes—Tuberales—the genus being *Tuber*. The ascocarp remains closed after it is mature and the ascospores are liberated only after the decay of the outer covering. Spore-disposal is effected through the agency of animals, especially rodents. In California, some of the Tuberales are a favourite food of wood rats¹ which detect them by their very characteristic smell. The fruit-bodies (ascocarps) dug up by the rats may be eaten on the spot or carried to their dens; in either case, pieces falling on the ground, usually inoculate the soil. Ascospores may also be distributed as undigested spores passing through the alimentary canal of the animal that has swallowed an ascocarp.³



Ascospores



Ascocarp

Last month I received some specimens of truffles through the kindness of Dr. Mukherjee, Director of the Central Drugs Laboratory, Calcutta, collected from Kodaikanal hills (Madras) by Mr. C. G. Hylten Cavallius of the Western India Match Co. Ltd., in June and July 1948. The ascocarp is about 4 cm. long and oval-shaped with warty scales on the outer surface; ascospores are brownish, globose with diameter 10-12 μ spore-wall distinctly spiny, ascospores (2-4) enclosed within clavate thin walled asci. This *Tuber* sp. is a rare find for India. There is only one previous record of truffle from India, *Tuber indicum* Cke, and Masee in "Himalayan Truffle, 1892" listed in 'Fungi of India' by Butler and Bisby¹, it was collected by Duthie in Mussoorie hills.

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September 15, 1948.

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1. Butler and Bisby, *Fungi of India*, 1931. 2. Dangeard, P. A., *Le Botaniste*, 1894, 4, 61-87, 3. Masee, G., *Ann. Bot.*, 1909, 23, 243-63. 4. Parks, H. E., *Micologia*, 1919, 11, 10-21.

ACTIVE ELONGATION OF UNSTRIATED MUSCLE

RELAXATION of striated muscle is known to be active; see Ramsey (1947) for references. Singh (1944), Singh and Singh (1946), Singh, Singh and Muthana (1947) have described active elongation of unstriated muscle. These experiments, however, were not satisfactory owing either to abnormal stimulus or abnormal saline used. Satisfactory evidence of active elongation during relaxation has now been obtained. Pieces of dog's stomach, if carefully dissected relax actively when stimulated with alternating current (12 volts for 10 seconds). The results are shown in Table I. The muscle was laid in a trough and stimulated isotonicly. If the dissection is not good, then the pieces curl or twist and it is then difficult to follow relaxation.

Experiments Nos.	Resting length of muscle; mm.	Length during contraction mm.	Length after Relaxation mm.
1	55	24 (43, p.c.)	35 (63, p.c.)
2	65	40 (61, p.c.)	65 (100, p.c.)
3	60	32 (53, p.c.)	54 (90, p.c.)
4	39	35 (89, p.c.)	41 (105, p.c.)
5	55	31 (56, p.c.)	46 (83, p.c.)
6	66	42 (63, p.c.)	59 (89, p.c.)
7	65	34 (52, p.c.)	63 (97, p.c.)
8	65	43 (66, p.c.)	62 (95, p.c.)
9	52	30 (57, p.c.)	50 (96, p.c.)
10	30	20 (66, p.c.)	32 (106, p.c.)

It will be seen from the table that the relaxation is complete in many muscles. Active relaxation is antagonised by substances that produce tonic contraction, such as excess of lithium, ammonium, potassium, calcium, strontium, barium, bromide, nitrate, iodide, thiocyanate, cyanide, acetylcholine, iodoacetic acid. It is less evident if a strong stimulus is used (50 volts), or if the muscle is asphyxiated or after soaking in saline for about an hour, a procedure which increases tone.

Tonic contraction is then due to interference with active relaxation, in agreement with views recently published (Singh and Singh, 1948).

Physiological Laboratory, Inderjit Singh.
Medical College, Sunita Inderjit Singh.
Agra,
September 22, 1948.

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