

tained on PDA. The isolates were identified by authentic cultures maintained in the laboratory. The pathogenicity of the isolated fungi were tested on healthy bulbs by shallow pin pricking and knife injury methods of Tandon and Mishra¹. The uninjured healthy bulbs were also dipped in spore suspension of the respective fungi for a few minutes to serve as control. All inoculated bulbs were incubated at 28° C ($\pm 2^\circ$ C). Corresponding controls were also maintained. Where a part of the bulb showed rotting, the disease intensity was calculated by the modified formula of Weaver and Clements².

Two fungal species, viz., *Aspergillus niger* Van tieghem and *Cephalosporium curtipes* Saccardo fully satisfied the Koch's postulate when inoculated after pin pricking and knife injury methods. The uninjured bulbs dipped in spore suspension did not develop rotting, indicating that the intact bulbs are not affected by either of the fungi.

The bulbs, when inoculated by pin pricking method, exhibited maximum rot in terms of colour changes and tissue maceration. *Aspergillus niger* first developed white mycelia on the surface which were soon covered with black spores. In about 10 days time, the bulb was deshaped, turned black and pulpy. With a little bit of pressure the entire bulb was crushed including the stem and roots and bad smelling liquid secretion resulted. *Cephalosporium curtipes* induced dark brown colouration and within the above period, the rotting though spread into entire bulb, was not so severe. In this case, when the pressure is applied, the scales get easily separated. The scales, still maintained their identities but the beginning of rotting was visibly evident by association of the yellowish brown liquid secretion with bad odour.

When the bulbs were inoculated by single shallow knife incision, a lesser amount of rotting occurred. In 10 days, 20.8 and 26.6% rotting was induced by *Aspergillus niger* and *Cephalosporium curtipes* respectively. Both fungi macerated tissue and formed shallow cavities (about 2 mm. dia. and 1-1.5 mm. depth) at the site of the inoculation. The bordering tissue of the cavities become slightly pulpy with a little bit of liquid secretion.

These two rot diseases of onion are new records for India and are of considerable commercial importance because the onions are stored for a pretty long time. Since the present causal pathogens are abundantly present in the air spora, any minor damage(s) to the outer skin may spoil the bulb and cause considerable loss.

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1. Tandon, R. N. and Mishra, A. N., *Indian Phytopath.*, 1969, 22, 334.
2. Weaver, J. E. and Clements, F. E., *Plant Ecology*, McGraw-Hill Book Co.,-Inc., London, 1938.

A NEW SPECIES OF *HIPPOPORINA* (ECTIOPROCTA, ASCOPHORA) FROM BOMBAY COAST*

A NEW species of the genus *Hippoporina* Neviani found to occur abundantly at the Trombay area of Bombay port, is described. Incidentally, this is the first record of the genus *Hippoporina* from Indian waters.

Hippoporina indica sp. nov.
(Figs. 1 to 4)

Several colonies were collected from Trombay, (a part of Bombay port, long. 72° 54' E and lat. 18° 54' N,) on different dates from 1968 onwards.

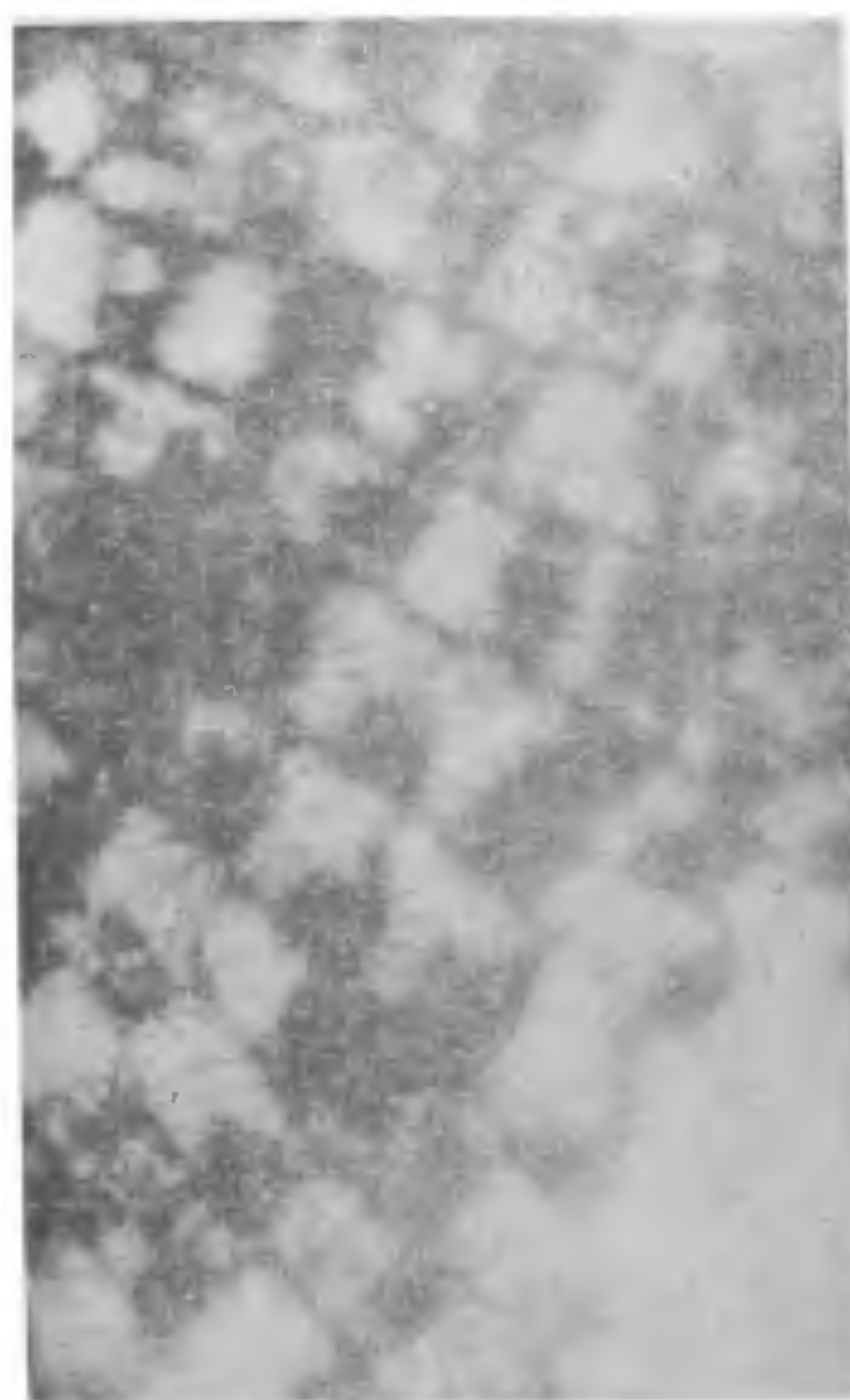
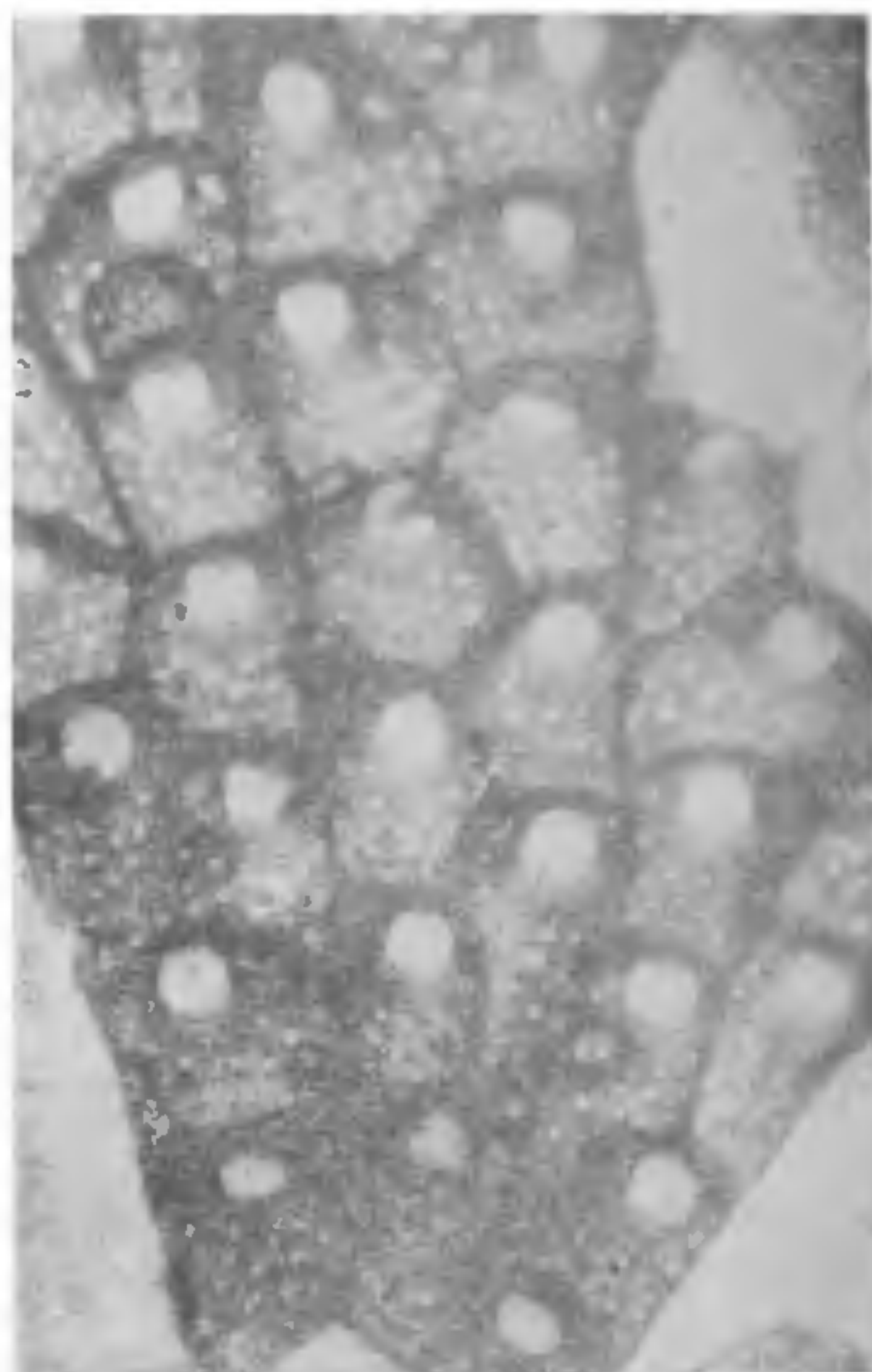
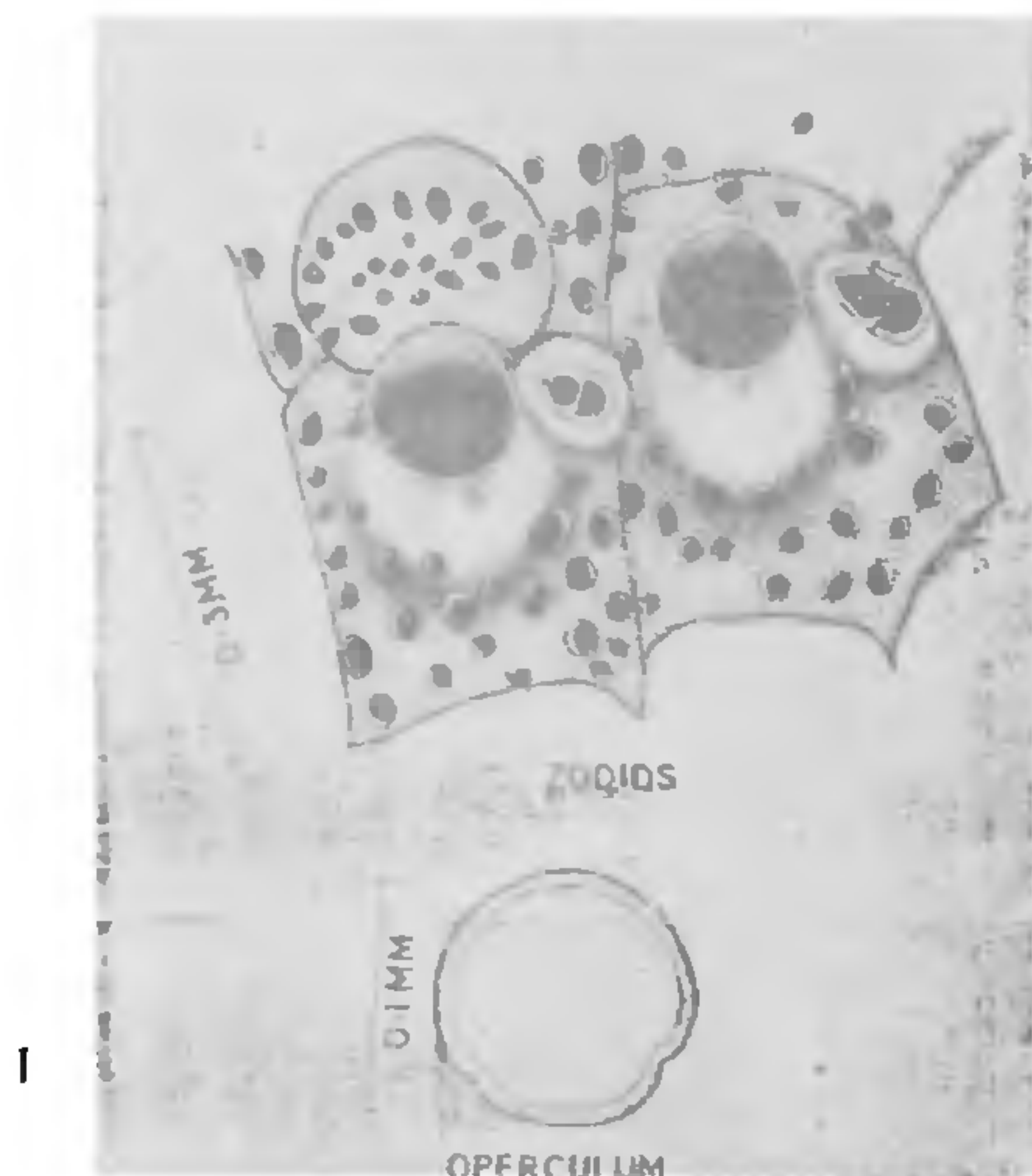
Diagnosis

Zoarium cream coloured, developing a reddish tinge on maturity, forming unilaminar or multilaminar encrustations: Zooids distinct, rectangular to hexagonal in shape, arranged in longitudinal rows, separated by prominent furrows; orifice oblong, with a pair of proximal lateral denticles forming a crescent shaped sinus; denticles robust; orificial collar rather low and simple; operculum with a narrow sclerite encircling its border; frontal wall inflated and perforated by evenly spaced moderate sized pores, except for a granular elevated shelf proximal to the orifice, projecting as a well-developed umbo suborally. pseudopores 16-34 in number, average being 24; frontal surface roughened by thickenings of calcifications between the pores; these become costate giving rise to two or three blunt processes, one laterally and another proximally to the orifice; lateral walls with 4-6 communication pores (septula) in a row situated close to the base; distal wall with 10-17 pores scattered near the base.

Avicularium adventitious, sometimes wanting; usually single (rarely double) located laterally to the orifice, rarely suboral; rostrum short acuminate and directed towards orifice; chambers swollen with a

complete bar in between; mandible transparent in the shape of lotus petal.

Ovicells hyperstomial, globular and not closed by operculum; wider than long, with 6-22 irregularly



FIGS. 1-4. Fig. 1. *Hippoporina indica* sp. nov. Fig. 2. Zooecium of *Hippoporina indica*, $\times 40$. Fig. 3. Zooecium of *Hippoporina indica* showing ovicells, $\times 60$. Fig. 4. Feeding colony of *Hippoporina indica*, $\times 35$.

shaped perforations. Developing embryos of orange coloration.

The length and width of zooids show wider variations (length 0.303–0.578 mm; width 0.143–0.406 mm). Depending on the size of zooids on which they grow, a similar variation is also marked in avicularia. Orifices and ovicells are fairly constant in size.

Fifty species are known so far in the genus *Hippoporina* (personal communication from P. L. Cook). *H. indica* sp. nov., differs from all of them in possessing two or three costate processes around the orifice—a unique character of this species only. *H. americana* (Verrill)² seems to be closely related to this species. Both have same shape and pattern of zooids and possess globular hyperstomial ovicells with irregularly shaped perforations. The calcifications and texture of the frontal wall are very similar in both the species. Features which serve to distinguish *H. indica* from *H. americana* are shown in Table I.

TABLE I

Comparison of *H. americana* (Verrill) and *H. indica* sp.n. (measurements, mean values, in mm)

No.	Character	<i>H. americana</i> (Verrill) ²	<i>H. indica</i> sp.n.
1	2	3	4
1.	Zooid length	0.538	0.386
2.	Zooid width	0.314	0.264
3.	Orifice length	0.177	0.122
4.	Orifice width	0.150	0.121
5.	Ovicell length	0.210	0.166
6.	Ovicell width	0.249	0.218
7.	Condyles	delicate	robust
8.	Operculum sclerite	well developed	well developed
9.	Orificial collar	elevated laterally into lappet-like processes	low and simple
10.	Lateral wall septula	4 pores near the base	4–6 pores in a row near the base
11.	Distal wall septula	a pair of multiporous rosette plates in the lower part	10–17 pores scattered near to the base

TABLE I (Contd.)

1	2	3	4
12.	Avicularia	medial and suboral on the distal surface of the umbo. Rostrum points proximally.	usually located lateral to the orifice, rarely suboral. Rostrum points towards the orifice.
13.	Ovicell	Very prominent with irregularly shaped pores	very prominent with irregularly shaped pores
14.	Frontal wall	less than 13 pores	16–34 pores
15.	Processes around orifice	single, umbonate process, situated proximal to the orifice.	2–3, on the lateral and proximal sides of the orifice.

Type specimen deposited in the collections of the Wood Preservation Centre (Marine) of Forest Research Institute & Colleges, Central Institute of Fisheries Education, Bombay.

Hippoporina indica is essentially a marine form occurring throughout the year at the test site with maximum intensity in October and November. Settlement of this species is found to be confined to the zone below the low tide level, their intensity increasing with depth. Sexual maturity is reached 22–25 days after settlement.

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1. Neviani, A., *Boll. Soc. Roma Studi Zool.*, 1895, 4, 109.

2. Mauro, F. J. S. and Schoff, T. J. M., *Postilla*, 1968, 120, 60.