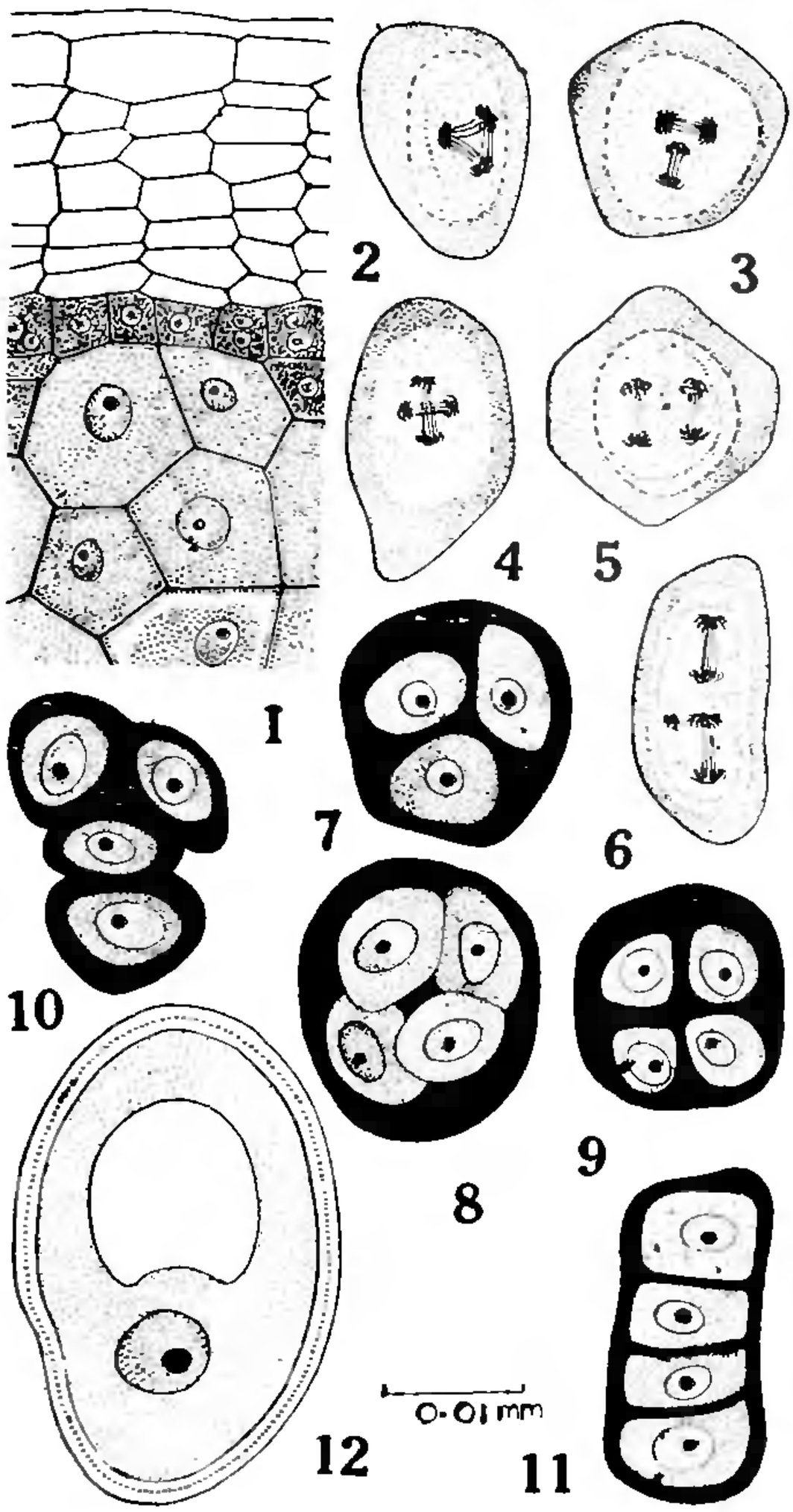
Tricolporate, colpi ± 42 μ long. narrow slit-like, ends pointed, Ora lalongate (± 4 × 14 μ), polar margins of the ora thickened.

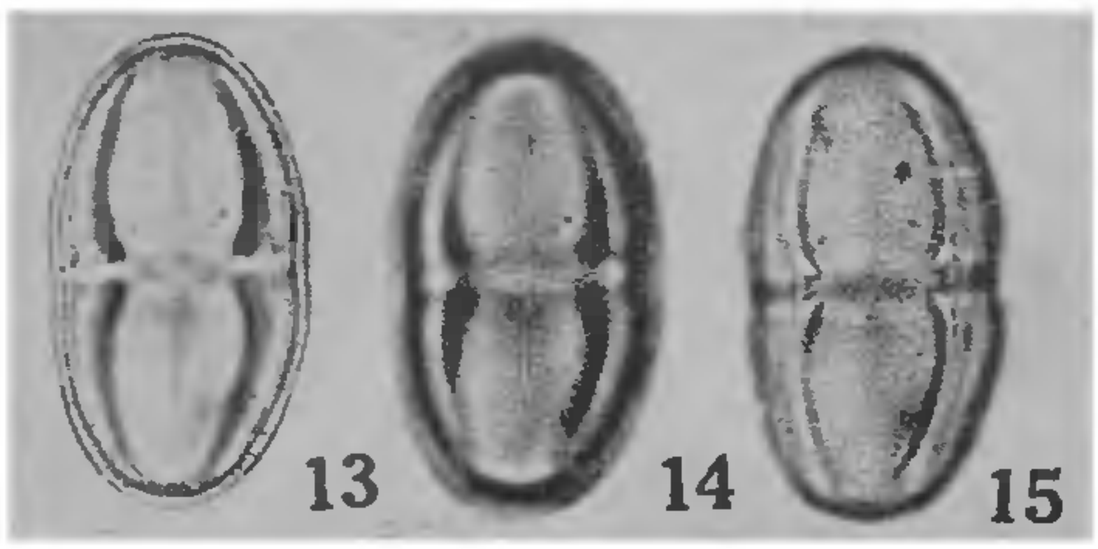


FIGS. 1–12. Microsporogenesis in *Melianthus major*. Fig. 1. Portion of anther wall at microspore mother cell stage, Figs. 2–6. Dividing mother cells. Figs. 7–11. Different types of tetrades. Fig. 12. Male gametophyte.

Exine 3 μ thick, sexine ± 1·5 μ thick, pertectate. Tectum supported by densely placed bacules. Nexine as thick as sexine (Figs. 13–15).

The microsporangia of each anther lobe are unequal in size, thus there is no coalescence of the adjacent locules and each microsporangium dehisces independently. At the region of dehiscence the cells of endothecium are small, they fail to develop fibrous thickenings and become cuticularised.

Morphologically quite distinct from Sapindaceous taxon, the genus *Melianthus* also differs in the development of microsporangia, microsporogenesis and male gametophyte from the worked out members of Sapindaceae in the presence of features such as persisting epidermis, 3–5 middle layers, biseriate tapetum, linear and 'T'-shaped tetrads, cytokinesis by furrowing as well as cell plate formation, 3-nucleate pollen grains at shedding, no coalescence of adjacent sporangia, and independent dehiscence of each lobe.



FIGS. 13–15. Pollen grains of *Melianthus major*

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VIBRIO PARAHAEMOLYTICUS IN THE MARINE ENVIRONMENT AT PORTO NOVO

INFORMATION on the occurrence of *Vibrio parahaemolyticus* from India is scanty. Chatterjee *et al.*[1] were the first to isolate *V. parahaemolyticus* and other associated non-cholera vibrios from the faeces of patients with diarrhoea in Calcutta. Recently, Bose and Chandrasekar[2] reported the occurrence of *V. parahaemolyticus* in the slime of marine prawns from the

coastal waters of Nagapattinam. "A multicentric study on *V. parahaemolyticus*" is now underway at the Hoffkine Bio-Pharmaceutical Corporation Ltd, Bombay and at Cholera Research Centre, Calcutta, to study this pathogen in India.

The present study indicates the occurrence of *V. parahaemolyticus* and allied vibrios in shell fish, plankton and sediments of Porto Novo (11° 29' N—79° 40' E) along the east coast of South India.

Three species of shell fish, *viz.*, the oysters *Crassostrea madrasensis*, the Cockle, *Anadara rhombia* and the crab, *Portunus sanguinolentus* were collected from the fish landing centre and were immediately washed well with 50% sterile sea water. Swabs of the shell surface, mantle and faeces were then taken from *C. madrasensis* and *A. rhombia*. In addition to the swabs of the shell surface, the faeces and haemolymph of *P. sanguinolentus* were also screened. Plankton samples were harvested using a bolting silk No. 10 horizontal tow plankton net (0·158 mm mesh).

The sediment samples were collected using a Petersen grab from 3 different biotopes, namely mangrove, backwater and estuary.

A preliminary survey to study the distribution of *V. parahaemolyticus* in the sediments of the Vellar estuary (fish landing site) was also attempted. These sediment samples were collected on 5 occasions (From December, 1975 to February, 1976), serial dilutions were prepared and then pour plated with TCBS medium.

Samples derived from the various sources described above, were streaked on to TCBS medium (the composition of which is given in Table I) and incubated at 37°C for 24 hours. Following the suggestions of Kaneko and Colwell[3] colonies appearing on TCBS agar were regarded as presumptive vibrios (PV) or Vibrio-like organisms (VLO). "Typical" smooth, turbid, bluish green colonies on TCBS agar were regarded as presumptive *V. parahaemolyticus* (PVP) or *V. parahaemolyticus*-like organisms (VPLO). The ensuing isolates were restreaked repeatedly to obtain pure cultures.

The PV or VLO were identified according to standard methodology[4]. The identification protocol for PVP or VPLO was based on the 18 biochemical tests recommended by Kaneko and Colwell[5] for the rapid and reliable identification of *V. parahaemolyticus*. In order to confirm the identification, parallel tests were conducted alongside using a reference Japanese strain obtained from Zen Yoji through CFTRI, Mysore. The results obtained from the biochemical screening for *V. parahaemolyticus* are shown in Table II.

TABLE I

Composition of thiosulfate citrate bile salt sucrose agar (TCBS)

Ingredients	Quantity (g/1000 ml)
Yeast extract	— 5
Peptone	—10
Sodium citrate	—10
Sodium thiosulfate	—10
Oxgall	— 5
Sodium cholate	— 3
Sucrose	—20
NaCl	—10
Ferric citrate	— 1
Bromothymol blue	— 0·04
Thymol blue	— 0·04
Agar	—15
pH 8·6	

TABLE II

Results of the biochemical tests employed for identification of V. parahaemolyticus *(as recommended by Kaneko and Colwell[5]) in comparison to the Japanese strain (Serotype unknown)*

Test	Reaction: Porto Novo Strains	Reaction: Japanese Strain
Gram Stains	— (21)	—
Motility	+ (21)	+
Growth in NaCl :		
0%	— (21)	—
3%	+ (21)	+
7%	+ (21)	+
10%	— (21)	—
Oxidase Test	+ (21)	+
Fermentation of :		
Glucose (Acid)	+ (21)	+
Lactose (Acid)	— (21)	—
Sucrose (Acid)	— (21)	—
Mannitol (Acid)	+ (17)	+
H_2S Production	— (21)	—
Voges-pnoskauer Test	— (18)	—
Indole production	+ (21)	+
NO_3 Reduction	+ (21)	+
Catalase Test	+ (21)	+
Methyl Red Test	+ (18)	+
Bioluminiscence	— (21)	—

N.B.: Figures in parenthesis denote the number of positive *V. parahaemolyticus* isolates out of a total of 21 PVP or VPLO isolates tested.

The occurrence and distribution of *V. parahaemolyticus* and allied vibrios *V. alginolyticus, V. fischeri, V. costicola* and *V. anguillarum*) from the various sources are shown in Table III

VLO—$2{\cdot}3\times10^2$ to 240×10^2 per gram dry weight of sediment.

VPLO—$1{\cdot}3\times10^2$ to 238×10^2 per gram dry weight of sediment.

TABLE III

Occurrence of V. parahaemolyticus *and related vibrios in shell fish, plankton and sediments*

Sample	Source	No. of samples	No. of isolates (VPLO)	*Vibrio* Spp. *V. parahaemolyticus*	*V. alginolyticus*	*V. costicola*	*V. fisheri*	*V. anguillarum*
SHELL FISH								
A. rhombia	Shell surface	7	5	0	0	0	5	0
	Mantle	7	1	1	0	0	0	0
	Faecal matter	7	0	0	0	0	0	0
C. madrasensis	Shell surface	12	9	7	0	0	1	1
	Mantle	12	6	6	0	0	0	0
	Faecal matter	12	0	0	0	0	0	0
P. sanguinolentus	Shell surface	5	3	0	0	0	1	2
	Faecal matter	5	4	3	0	0	1	0
	Haemolymph	5	5	4	0	0	1	0
	Egg mass	1	2	0	0	0	2	0
Sediments	Mangrove		20	6	5	3	5	1
	Backwater		25	4	10	8	1	2
	Estuary		40	25	4	4	3	4
Plankton		1	5	3	0	0	0	0

VLO and VPLO counts in sediment samples collected from the fish landing centre during three-month period are presented in Table IV. VLO and VPLO counts ranged as follows.

TABLE IV

Counts of VLO and VPLO in sediment samples from Porto Novo Fish Landing Centre

Date of Collection	VLO- counts* 10^2	VPLO counts* 10^2
12-12-1975	81·80	4·88
31-12-1975	63·15	18·12
14-01-1976	239·86	238·48
10-02-1976	2·28	1·28
29-02-1976	16·96	6·56

*Counts per gram dry weight of Sediment.

Maximum counts of VLO and VPLO were encountered during the middle of January (Postmonsoon period).

The *V. parahaemolyticus* strains isolated at Porto Novo closely resemble those isolated by Bose and Chandrasekar[3] at Nagapattinam, in being gram-negative, glucose (acid)–positive, Lactose (acid)–negative, mannitol (acid)–positive, oxidase–positive, nitrate reduction-positive and in exhibiting growth in 3% and 7% sodium chloride but not in 0% and 10% sodium chloride. The Porto Novo strains differed in being sucrose-negative and methyl red-positive.

The detection of this pathogen in shell fish, plankton and sediments of Porto Novo (which is an important landing centre for fish and prawns) calls for more detailed investigations on the ecology and seasonal distribution of *V. parahaemolyticus* in this region. Its potential hazard if any, in public health will have to be ascertained.

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POLLEN MORPHOLOGY OF AN *ERYTHRINA* HYBRID AND THEIR PARENTS

THE trophical genus *Erythrina* is characterised by dazzling red inflorescences, for which the plant is highly valued as an ornamental. While most species are arbrorscent, *E. resupinata,* a species from Terai forests, is of special importance for being an underground herbaceous perennial, with inflorescences arising directly from the root-stock. Several species of the genus have been brought into cultivation at the National Botanic Gardens, and an attempt has been made to cross the dwarf *E. resupinata* Roxb. (♀) with the tall *E. variegata* L. var. *orientalis* (L.) Merrill *forma parcelli* (Hort. ex Bull) Maheshwari (♂). The hybrid is shrubby in habit, but the characters of the flower show general dominance of the female parent[1].

Considering all the materials together, the pollen grains are three zonoporate and are with a reticulate exine surface[2]. The detailed data of pollen morphology (Fig. 1, A–C) of the two species and their hybrids are as follows:

E. resupinata.—3–(4)–zonoporate; pore diameter about 7 μ. Grain sizes: average 21 × 30 μ (Size classes E: 24 μ: 1%; 26 μ: 7%; 28 μ: 48%; 30 μ: 23%; 32 μ: 20%. 34 μ: 1%). Shape—oblate. Exine surface faintly reticulate; lumina smaller.

E. parcellii.—3–(4)–zonoporate; pore diameter about 6·6 μ. Grain sizs: average 32 × 39 μ. (Size classes E: 32 μ: 2%; 36 μ: 22%; 39 μ: 12%; 40 μ: 52%; 42 μ: 4%; 44 μ: 8%). Shape—oblate. Exine surface faintly reticulate; lumina larger, and with irregular muri.

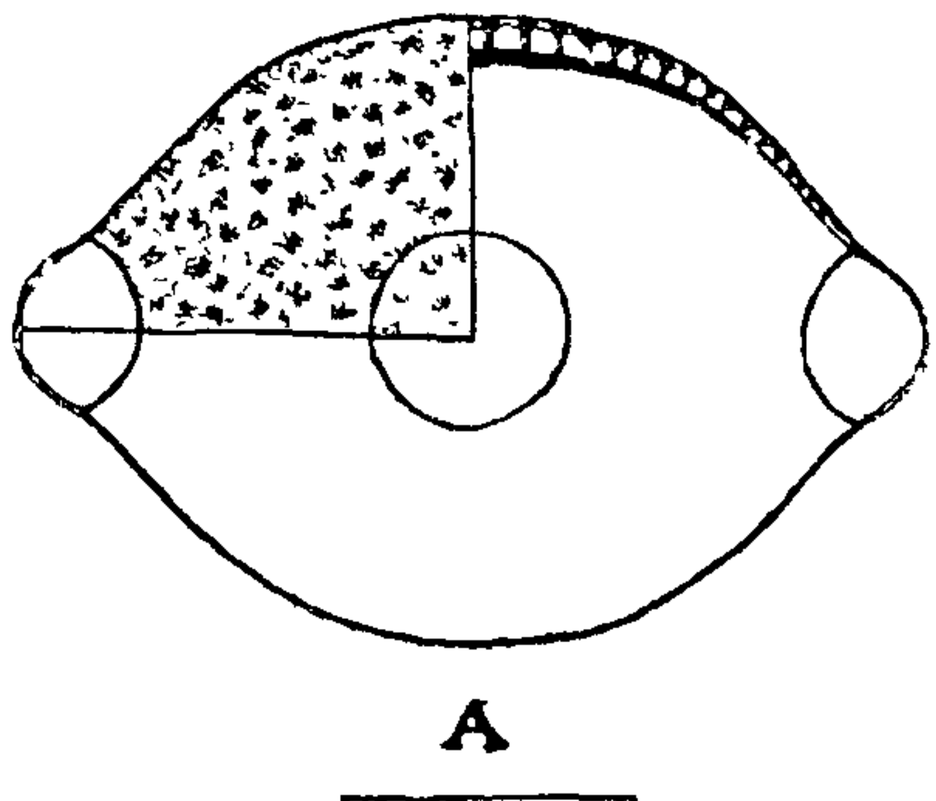

FIG. 1. A–C. Palynogram of *Erythrina.* A & B. *E. resupinata* (A. Equatorial view showing pore, general surface and strata; B. Reticulate ornamentation; note: brochi are small); C. *E. Variegata* (Reticulation; note: brochi large). Magnification: A × 1,500; B & C, × 3,000.

Hybrid.—Size classes: 28 μ: 14%; 30 μ: 25%; 32 μ: 52%; 34 μ: 19%; 39 μ: 17%.

The above data indicate that the dominant size class is 28 μ (range 24–34 μ), and the exine surface is provided with smaller brochi in *E. resupinata,* as against the higher average dominant size class of 40 μ (range 32–44 μ) and larger brochi on exine surface in *E. variegata.* In the hybrid, the dominant size class is 32 μ, and the exine surface is provided with smaller brochi as that in *E. resupinata,* and no grain of the *variegata* type has been observed to occur, which indicate the complete dominance of the characters of female pollen in the hybrid.

The present finding of the dominance of the female pollen type in the hybrid is contrary to the observations made by Hendersen[3] on *Meconopsis,* Olsson[4] on *Linaria,* Srivastava *et al.*[5] on *Amaranthus,* Srivastava[6] on *Corchorus,* and Srivastava[7] on *Tagetes,* in all of which the pollen in hybrid has been found to bear