Table 1 *Potato cyst nematode infestation in the Nilgiris*

Division	Number of villages surveyed	Number of holdings surveyed	Number of holdings infested	Level of infestation (grade)	Nematode species (number of holdings)		
					GR	GP	Mixture
Ooty	84	236	180	2.6	43	41	96
Coonoor	58	260	182	2.7	36	15	131
Kotagiri	47	101	61	2.7	12	5	44
Total	189	597	423		81	61	281

GR, Globodera rostochiensis; GP, G. pallida.

The following integrated cyst nematode management practices are suggested based on the findings of the present survey and earlier findings.

1. Adoption of a two-year rotation with non-host crops like French bean, pea and garlic, which causes a decline of nematode population by 80–90%[5].

2. Cultivation of the cyst nematode resistant cultivar Kufri Swarna once in two years combined with application of carbofuran at 1.125 kg a.i. per ha during planting.

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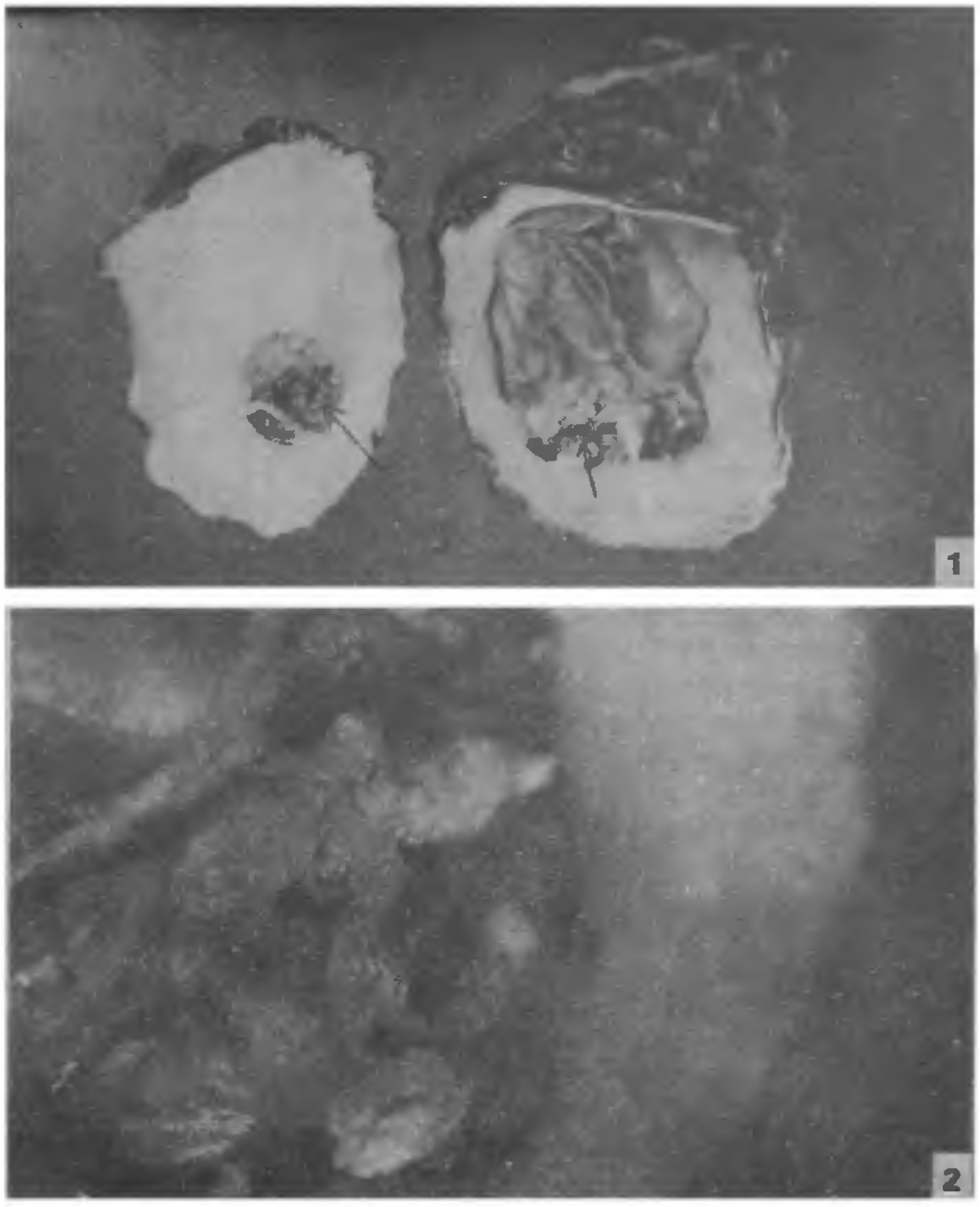
RARE OCCURRENCE OF *BALANUS AMPHITRITE* DARWIN, 1854, INSIDE THE COCK'S COMB OYSTER *CRASSOSTREA CRISTAGALLI* (LINNAEUS, 1758)

R. KASINATHAN, P. MADESWARAN and G. A. THIVAKARAN
Centre of Advanced Study in Marine Biology, Annamalai University, Parangipettai 608 502, India.

BARNACLES, by virtue of their ability to settle on any hard object, have attracted the attention of several workers[1–6]. From Indian waters, contributions made by Patil[7], Bhat and Bal[8], and Daniel[9] have added much information on this animal group. They are broadly divided into two groups, namely the pedunculate and the sessile barnacles[9]. Pedunculate barnacles are usually collected from floating objects like wood, logs and bottoms of fishing vessels, and sessile barnacles from rocky surfaces, piers, and molluscan and crustacean shells. Only the lepidomorph sessile barnacles (*Octolasmis* spp.) are known to inhabit the gills of crabs and lobsters, leading an ectosymbiotic life[10]. The molluscan forms usually associated with sessile barnacles are *Turritella angulata, Murex tribulus, Bursa spinosa, Pinna pectinata* and *Placenta placenta*. But in most cases, the barnacles were found attached on the external surface of the shell of these organisms.

During our routine survey in the rocky shore at Tuticorin, Tamil Nadu, we came across a live barnacle, *Balanus amphitrite*, attached inside the left valve of the Cock's comb oyster, *Crassostrea cristagalli*. The barnacle was found attached to the adductor muscle (figures 1 and 2). The shell of the oyster measured 4.7 cm in length and 4 cm in width. The barnacle measured 0.89 cm in height and 0.67 cm in diameter. The barnacle was active during collection, with the cilia actively sweeping the water for food particles. This observation is of interest in



Figures 1 and 2. **1,** *Balanus amphitrite* (arrow) on the adductor muscle of the oyster, *Crassostrea crisstagalli.* **2,** Enlarged view of figure 1.

that the occurrence of *Balanus amphitrite* inside a live bivalve shell close to the adductor muscle has not been reported so far. The present observation is contrary to the previously held view that barnacles usually prefer to settle on coarser and dark-coloured substrata[11]. The settling of barnacles has also been reported to be influenced by intensity of illumination, gregarious attraction, stage of tide, colour of the substratum, water current, wave action, primary film and presence of other organisms[9].

However, in the present observation, these factors seem to have had little influence as the substratum was smooth and white and a single barnacle was found inside the shell, where the intensity of light is low. For a better understanding of such a relationship it is imperative to study the behaviour of the cyprid larva of the barnacle.

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ROLE OF HEROLD'S ORGAN IN *ORYCTES RHINOCEROS* (COLEOPTERA: SCARABAEIDAE)

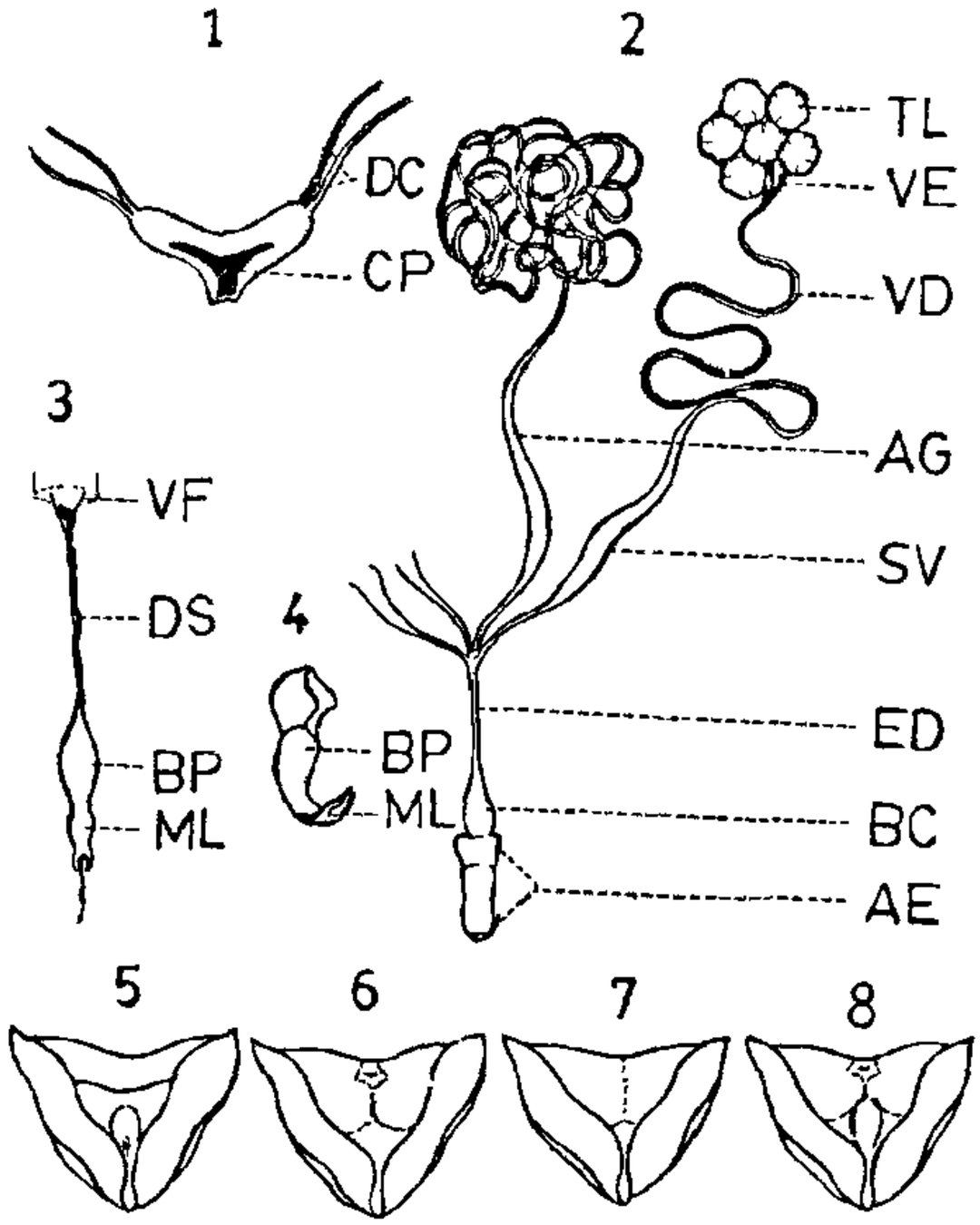
A. MINI and V. K. K. PRABHU
Department of Zoology, University of Kerala, Trivandrum 695 581, India.

MALE larvae of *Oryctes rhinoceros* possess the organ of Herold (OH), visible externally through the cuticle on the venter of the ninth a[1] dominal segment[1, 2]. This paper reports the results of extirpation and implantation studies carried out with the purpose of understanding the significance of this organ in *O. rhinoceros*.

For extirpation, mature third instar larvae 90 days after the moult were held under a binocular dissection microscope without anaesthesia and an oblique cut was made close and parallel to one side of the organ using a sharp blade. The OH was then pulled out gently through this opening and detached from the cuticle using fine forceps.

The OH (figure 1) had a more or less triangular chitinous plate enclosed within a transparent bag-like structure with two antero-lateral arms, each with a pair of cords arising from it distally. As these cords are delicate, transparent, and resemble the tracheae, it was not possible to trace their entire path or ensure their complete removal.

For implantation studies, the OH thus extirpated was carefully implanted into female larvae of the same age through a small opening made ventrally on



Figures 1–8. Figures illustrating experiments involving extirpation and implantation of Organ of Herold in *Oryctes rhinoceros* larvae. **1,** OH from 90-day-old third instar male larva. **2,** Male reproductive system in normal adult. **3,** Male reproductive system developed from OH implanted in the female larva. **4,** Normal aedeagus, **5–8,** Genital area of pupae of; **5,** normal male; **6,** normal female; **7,** 'pseudofemale'; **8,** 'mixed-sex'. AE, aedeagus; AG, accessory gland; BC, bulbous chamber; BP, basal piece; CP, chitinous plate; DC, distal cord; DS, dry strand; ED, ejaculatory duct; ML, median lobe; SV, seminal vesicle; TL, testis lobe; VD, vas deferens; VE, vas efferens; VF, vaginal floor.

the ninth abdominal segment a little anterior to the centre, in the same position as in the male. For sham-operated controls, a small piece of larval cuticle was implanted instead of OH. No antibiotics were applied.

The operated larvae were kept singly in containers (13 × 6.5 cm dia) for two days till the wounds healed completely; they were left over cow dung, their food, till 20 days after adult emergence. Sham-operated and normal controls were also maintained similarly.

Secondary sexual characteristics of the pupae as well as of adults from OH-extirpated and OH-implanted larvae were examined.

Adults developed from normal and sham-operated