IR20 and IR50 broadly showed a 15:1 segregation (susceptible to tolerant), three lines from IR50 showed 13:3 segregation and another three lines from IR50 showed a 1:1 segregation at the seedling stage (based on survival). The resistant segregants have been transplanted to the field and are being grown to maturity to get the R_2 generation seeds.

Stable salt-tolerant variants have been generated through tissue culture in tobacco and *Citrus*[11]. In rice also, salt-tolerant variants have been generated through cellular level screening, using seawater[12] or NaCl[13,14] as stressing agents. The present study reaffirms the fact that salt-tolerant variants that may find use in crop improvement can be generated through callus level screening in rice. A systematic progeny evaluation would reveal the actual worth of these variants in developing salt-tolerant varieties.

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NEUROANATOMY AND CHOLINESTERASE ACTIVITY IN *ACANTHOTAENIA MULTITESTICULATA* (CESTODA)

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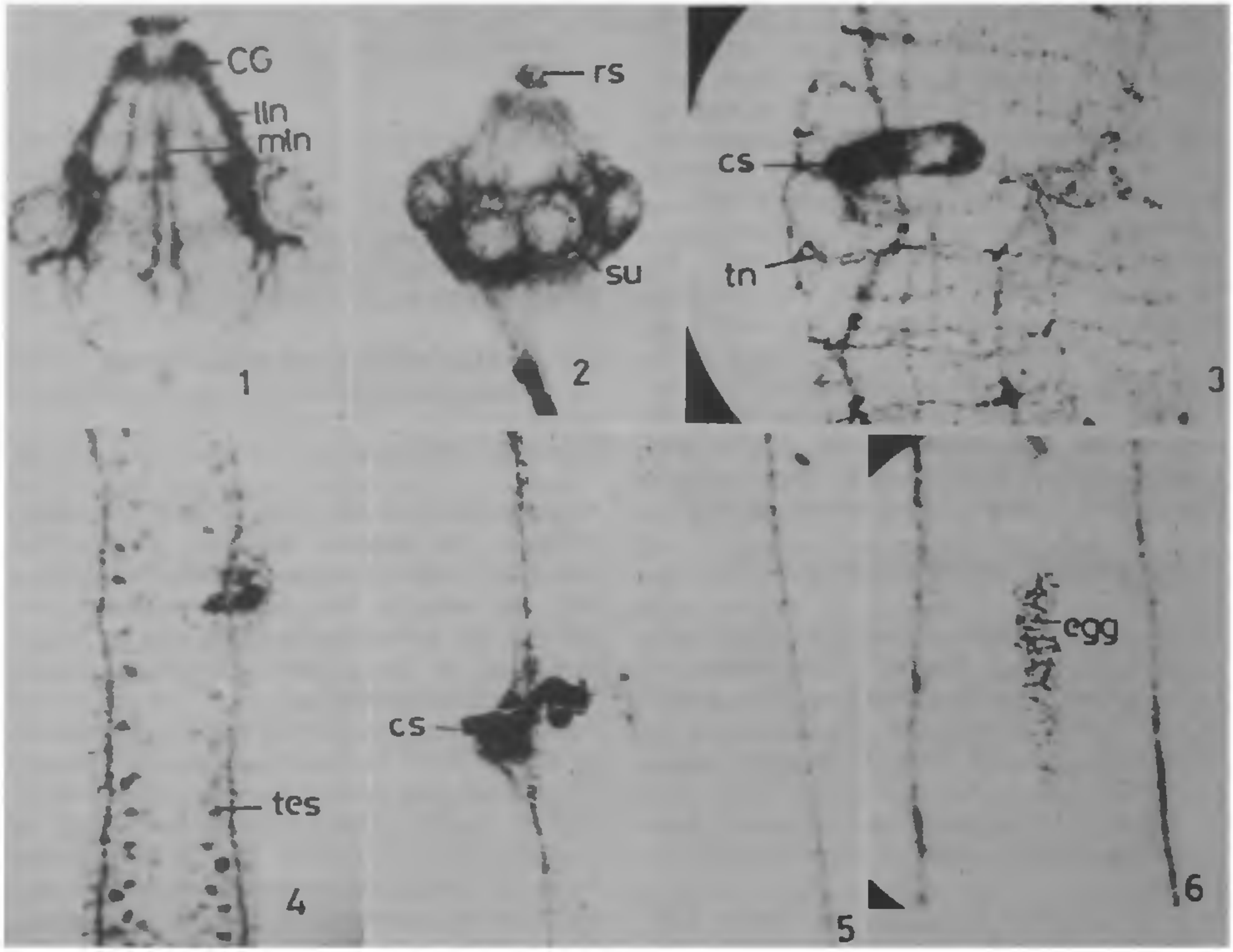
ACETYLCHOLINESTERAE (AChE, EC 3.1.1.7) has been shown in the nervous system in cestodes[1-4], nematodes[5,6] and trematodes[7]. However, comparatively less work has been done on this aspect in cestodes[8]. This communication reports work on AChE localization in the cestode *Acanthotaenia multitesticulata* (Proteocephalidae).

The parasites were collected from the intestine of the monitor lizard *Varanus bengalensis*. Immediately after removal from the host, the worms were washed twice in Tyrode's solution, pressed gently under a coverslip, and fixed in 10% formalin for 20 min. Following fixation the worms were washed in cold distilled water to remove all traces of the fixative. After washing, one group of worms was incubated in the medium of Holt and Withers[4], using 5-bromo-indoxyl acetate as substrate for 3–6 h at room temperature to detect non-specific esterases (NSE). Some worms were incubated in acetylthiocholine iodide (AThChI) to localize AChE following the direct colouring method of Karnovsky and Roots[5]. AChE activity was determined by its ability to hydrolyse the above substrates in the presence of pseudocholinesterase inhibitor tetraisopropyl pyrophosphoramide (10^{-5} μM)[9]. The possibility that other esterases besides cholinesterase could hydrolyse the substrates was eliminated in experiments using the specific cholinesterase inhibitor serine sulphate (10^{-5} μM).

The AChE activity in the parasites and in the medium was assayed colorimetrically. The enzyme assay and *in vitro* studies were carried out following the method of Gunn and Probert[3].

There are two small cerebral ganglia in the scolex, connected by a short cerebral commissure (figure 1). The two ganglia give rise to two median longitudinal



Figures 1–6. Localization of acetylcholinesterase and non-specific esterase activity in *Acanthotaenia multitesticulata*. **1,** AChE activity showing distribution of nerves in the scolex region (after incubation in acetylthiocholine iodide). **2,** NSE activity in scolex (after incubation in 5-bromoindoxyl acetate). **3,** AChE activity in a mature segment, showing distribution nerves. **4,** AChE activity in mature segment, showing enzyme activity in the testes. **5,** NSE activity in the cirrus sac. **6,** NSE activity in embryos in gravid segment. cg, Cerebral ganglion; lln, lateral longitudinal nerve; mln, median longitudinal nerve; rs, rostellum; su, sucker; cs, cirrus sac; tn, transverse nerves; tes, testes.

nerves and continue posteriorly. A much thicker prominent nerve, the laterodorsal, and two thinner lateroventral nerves originate distally from each ganglion and proceed posteriorly on either side of each median longitudinal nerve. In the gravid segments the dorsal longitudinal nerves are prominent, but median and ventral longitudinal nerves are not prominent (figure 6). The suckers are innervated with fine branches of nerves arising from the cerebral ganglia. The longitudinal nerves are connected by transverse nerves separating each segment (figure 3). The rostellar hooks of *A. multitesticulata* showed both AChE and NSE activity (figures 1 and 2).

The cirrus sac and testes of the male reproductive system, and vagina of the female reproductive system showed AChE activity (figures 3 and 5). The cirrus and embryos also showed NSE activity (figures 5 and 6). Enzyme assay indicated the presence of specific AChE since acetylcholine was hydrolysed at a higher rate than butyrylcholine. *In vitro* studies showed that some enzyme was also secreted.

The results show that AChE activity is present mainly in the nervous system of this cestode. When the nervous system of several species of cestodes[10,11], was incubated in *O*-acetyl-5-bromoindoxyl for localization of NSE, AChE activity was also found. In this study, the absence of reaction when eserine (10^{-5} μM) was used as an inhibitor with AThChI indicates that AChE is the chief enzyme. Contradictory results have been obtained in studies on the occurrence of AChE in embryos of cestodes[2,3,12,13]. But Rybicka[14] reported that only true AChE activity occurs in embryos. In the present study, the embryos showed only NSE activity.

AChE present in suckers and rostellum may be the chief neurotransmitter in the neuromuscular processes in contraction and eversion. In addition to neuromuscular transmission other roles have also been ascribed to this enzyme. Schwabe *et al.*[15] suggested that AChE is involved in permeability and osmoregulation of the hydatid cyst wall of *Echinococcus granulosus*. Arme[1] observed involvement of the enzyme in lipid excretion in *Ligula intestinalis*. According to Lee[10] and Ogilvie *et al.*[16] this enzyme acts as a biochemical hold-fast.

Parasite secretions may elicit immune response in the host. In the case of *A. multitesticulata* also, the secreted AChE may induce an immune response.

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FUNCTIONAL SIGNIFICANCE OF ARGINASE IN AESTIVATING SNAIL, *PILA GLOBOSA* (SWAINSON): NEUROENDOCRINE INVOLVEMENT

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THE mechanisms involved in the regulation of aestivation metabolism in molluscs have not been worked out thoroughly. This communication reports the functional significance of arginase in the hepatopancreas of the aestivating snail (*Pila globosa*) and possible neuroendocrine involvement in the regulation of aestivation metabolism with reference to excretion.

The collection, maintenance and mode of induction of aestivation in snails have been described elsewhere[1]. Three-month-aestivated snails were selected for the study. The five ganglia, viz. cerebral, buccal, pleuropedal, supra-intestinal and visceral, were isolated separately from both normal and aestivated snails. Ganglionic extracts (1%) were prepared in 80% ethanol and centrifuged at 1000 *g* for 20 min. The extracts (0.2 ml) prepared from active snails were injected into five batches (six snails each) of aestivating snails through a hole drilled near the operculum under aseptic conditions and the holes were closed immediately with sealing wax. Similarly, extracts of ganglia from aestivated snails were administered to five batches (six snails each) of active snails. Control snails received only 0.2 ml of ethanol. The snails were allowed to move freely in their containers in autoclaved water containing 1000 IU of penicillin per litre. After 60 min the hepatopancreas was isolated in the cold for estimation of