**Abstract**

The labyrinthine organs of *Macropoduscupanus* are shown to be effective in gas exchange during bimodal breathing. Under completely aerial conditions, significant participation of the labyrinthine organ in gas exchange is doubtful. Amputation of the labyrinthine organ increases the air breathing frequency. The period of survival out of water in amputated fishes is limited. The labyrinthine organ promotes trapping and retention of air in the suprabranchial chamber. It might also serve to minimise the evaporation of water from the labyrinthine organ.