

Biology of the Nurseryfish

FROM NORTHERN AUSTRALIA

It's a Tough Job

The nurseryfish, *Kurtus gulliveri*, is remarkable for its bizarre method of parental care. The male carries the eggs on a hook on his head like a cluster of grapes. Virtually nothing was known about this strange species that lives in fresh and brackish waters of coastal rivers of northern Australia and southern New Guinea. The most recent scientific papers on this species were published over 90 years ago. With small grants from the Columbus Zoo, the National Geographic Society, and Bioscience Productions, I began a 10-month field study of nurseryfish in the Adelaide River near Darwin, Northern Territory, Australia in 2001. My headquarters was the Museum and Art Gallery of the Northern Territory where I am a Research Associate. Logistic and field assistance was provided by Dion Wedd, aquarium supervisor at the Territory Wildlife Park.

Complicating field work was the fact that the Adelaide River has a thriving population of salt water crocodiles, *Crocodylus porosus*. These large, dangerous animals have been condi-

tioned to the sound of the motor of local tour boat operators who dangle chicken pieces on a rope and entice the crocodiles to leap into the air to pull down a snack. A 15-foot crocodile can explode through the murky water surface and grab a lure held six feet over the water.

This made leaning over the boat to pull in the gill net very interesting to say the least. I ceased wearing chicken fat aftershave immediately upon seeing my first 15-foot jumping crocodile a few feet from my 14-foot boat!

What follows is a summary of results from my study. The collection of live nurseryfish has never been recorded until now. A beautiful iridescent violet wash covers the body. This "neon glow" grades to rosy pink and brassy yellow. The head and chest are silvery with bluish highlights. Nurseryfish have many unusual skeletal modifications that were examined by CT scans and dissection. The male's hook is a bony extension of the skull. The ribs are flattened and form a rigid cocoon around a multi-lobed swim bladder. This arrangement appears to be a

sound receptor. Detailed histological studies are in progress to determine how this apparatus functions. The skin in the cleft of the male's hook is highly modified for egg carrying. The epidermis in this region is folded into many crypts that hold the egg mass, and the dermis is very spongy and engorged with blood that helps clamp the egg mass in place.

Collection of nurseryfish larvae in plankton samples revealed that the spawning season coincides with the "dry season" from April to November. The monsoon season brings heavy flooding to the area from December to March. The approximately 1000 embryos developing in the egg mass on the male's head hatch when they are about ¼ inch long, and they feed on their stored yolk. Shortly after the yolk-sac is resorbed they develop teeth and feed on plankton. A complete size series of nurseryfish from late stage embryos in egg masses through larvae to adults 12 inches long was collected



Male nurseryfish, about 8 inches long, with egg mass, from New Guinea. Kent Hortle provided by Gerry Allen



Left: Jumping crocodile in the Adelaide River. Below: Another day at the office. Dr. Berra eyeing crocodile on bank of Adelaide River in the Northern Territory of Australia. Unless otherwise noted, photography is courtesy of Dr. Tim Berra





Male nurseryfish showing live coloration.

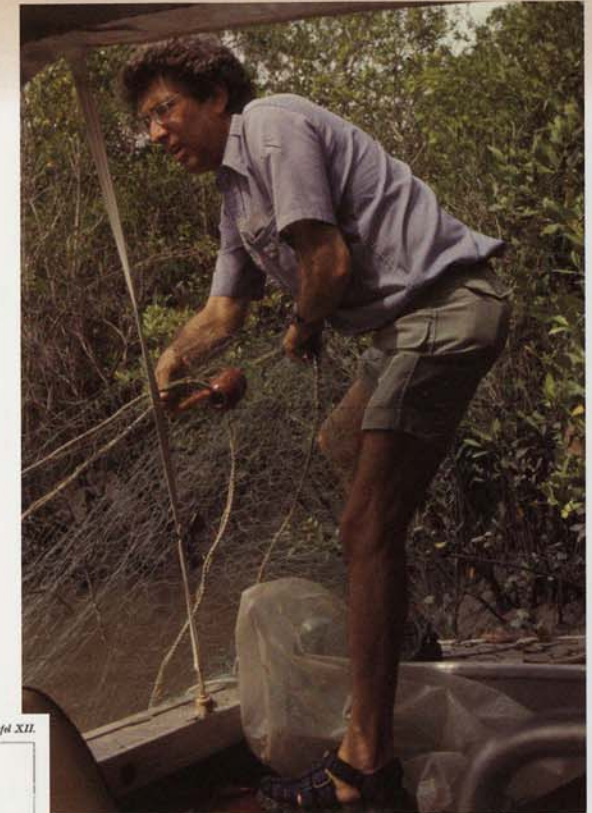
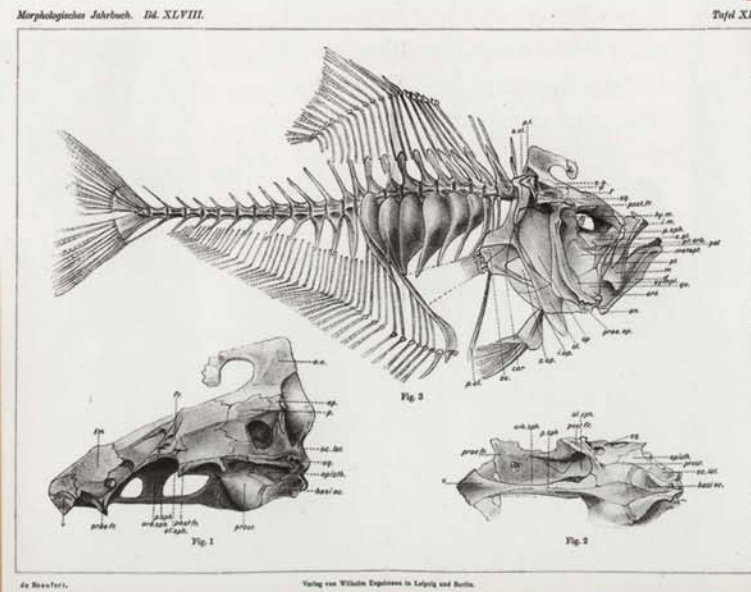
and described. Adult nurseryfish stomach contents included prawns, isopods, and small fishes. Further laboratory studies on preserved specimens are underway to examine ovarian activity and age and growth based on ear stones. A morphological study revealed that *Kurtus gulliveri* is a distinct species from the only other member of its family, *Kurtus indicus*, from southeast Asia. Molecular systematic studies are in progress to determine the closest relatives of nurseryfish. From this we may learn how "forehead brooding" evolved.

Nurseryfish are a difficult species to keep in captivity. How the eggs become attached to the male's hook will have to await further developments in husbandry. Once nurseryfish can be successfully kept

in captivity, we may see courtship and spawning behavior. Because of the crocodiles and the very turbid water it is not possible to dive in the river or view nurseryfish remotely with an unmanned video camera. It would be interesting to know if the

male carrying the embryos is their daddy, or has he been cuckolded into carrying someone else's babies. This is a question for the future and an excuse to return to this rugged tropical paradise.

Skeleton of male nurseryfish showing the bony basis of the hook and the unusual ribs. Drawing from a 1914 paper by de Beaufort.



Dr. Berra checks his gill net and hopes his head does not look like a chicken.

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