

TOWARDS CONSERVATION OF THE FRESH WATER RIVER TERRAPIN, *BATAGUR BASKA*: PRELIMINARY DATA ON THE BIOLOGY AND DEVELOPMENT OF GENETIC MARKERS

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INTRODUCTION

The river terrapin, *Batagur baska* or locally known as tuntung, is a freshwater turtle that inhabit the Southern and SE Asia from West Bengal, India to South Vietnam and Sumatra right down to Peninsular Malaysia. In Thailand this species is found in Pak Payoon, Phattalung Province and Amphur Ranote, Songkhla Province (Wirot, 1979). In Malaysia this species is found in large rivers with noticeable numbers in the Perak, Terengganu and the Bukit Pinang River. However, throughout this region the population is dwindling such as that it is now listed as an endangered species by the International Union for Conservation of Nature and Natural Resources (IUCN).

Morphological description on the taxon has appeared frequently since the 19th century (Pritchard, 1979, and Wirot, 1979 and references within). Several local studies on the natural history, biology, ecology and conservation of *B. baska* have also been documented (Momin Khan, 1964; Hendrickson and Balasingam, 1966; Moll, 1987; Mashhor and Hifni, 1985; Shariff *et. al.*, 1986; and Hifni, 1992). However, biological data on the local *B. baska* is still unsatisfactory and genetic information non-existent (Moll, 1978). Such information are crucial in a systematic conservation programme.

This study reports on the investigation conducted on an important biological aspect: dietary requirement on the growth. of this species. Preliminary data on development of RAPD markers for genetic assessment is also presented.

MATERIALS AND METHODS

Effects of different dietary regime

This study was carried out on 20 young hatchling tuntungs that were obtained from the Tuntung Hatchling and Nursery Centre, Bukit Pinang, Kedah, aged about 1 month. The tuntungs were fed daily according to 3 different food treatment; fish (F), kangkung (K), and pellet (P), and a control (C), composed all three food ingredients, using 5 replicates for each treatment. Each specimen was isolated in a single enclosure, filled with 0.5-1.0ℓ water. Four growth parameters (weight, carapace length, carapace width, and plastron length, according to Harless & Morlock, 1979) were measured weekly for a period of four months.

Development of Random Amplified Polymorphic DNA (RAPD) markers

Blood samples were obtained from live specimens and preserved in lysis buffer (Bowen, *et. al.*, 1996) the specimens were released after the procedure. DNA was extracted using Pure Gene Blood DNA Kit. II. The DNA extract was amplified by PCR reaction using 20 primers from set OPAB. The optimal reaction conditions consisted of 1X reaction buffer; MgCl₂ 3.5 mM; dNTP mixture 0.6 μM; primer 15 picomoles; *Taq* polymerase 2.0 units; template DNA 40 ng and distilled water in a final volume of 25 μl. The amplification was performed using a programmable temperature cyler (MJ Research). Amplification was programmed at 35 cycles

for 30 seconds of denaturation at 94°C, 30 seconds of annealing at 36°C, 1 minute of extension at 72°C, and 2 minutes of final extension at 72°C.

RESULTS AND DISCUSSION

Anova and Kruskal Wallis statistical test showed significant difference among treatment for all parameters observed. Weight gain was highest in K (6.196 ± 4.0073) followed by C, F, and P (2.825 ± 2.238). Similarly, carapace width was highest in treatment K (0.1514 ± 0.0600) followed by C, F, and P (0.0772 ± 0.0390). Carapace length also showed the best growth given by treatment K (0.1498 ± 0.0613) followed by C, F, and P (0.0578 ± 0.0233) whereas the best growth for plastron length was given by C (0.1379 ± 0.0650) followed by treatment K, F, and P (0.0749 ± 0.0369). Based on the results, kangkung gave the best overall growth rate. However tuntung fed only on kangkung developed soft shell, which is very dangerous for their survival whereas the other three treatments gave healthy shell. Control diet composed of fish, kangkung, and pellet gave good healthy shell and an overall good growth performance. Furthermore tuntung fed on the control diet developed the best plastron growth compared to a only kangkung diet. Big and strong plastron is very important to protect their ventral side. Therefore we suggest that young hatchling tuntung should be fed with fish, kangkung, and pellet.

In the RAPD analysis, of the 20 primers tested only OPAB-07 and OPA-08 produced clear and reproducible bands numbering five and eight respectively among all individuals tested.

CONCLUSION

The management and conservation of this species should be given prime consideration. Several steps have already been taken by the government under the Jabatan PERHILITAN to manage this natural resource, among them the setting up of the Hatchery and Nursery Centres at Sg. Batang Pinang in Kedah as well as those in Perak and Trengganu. But since 1967, the wild population has further decline in numbers, thus a new strategy should be planned. Information on genetic variation between populations is invaluable in a genetic conservation programme. The reason for this is two-fold: firstly, is in the management of existing wild populations and secondly in the improvization of the present breeding programme. Genetic consideration should now be given priority when selecting for parental stocks in a breeding programme: for instance selection for highly variable and distantly related parents. Results on the RAPD shows that this technique is potentially useful in assessing genetic within and between populations. Future studies will include more populations. We would also like to investigate the relationship between Malaysian population and their presumed origin, the Thai population if the opportunity arises. However, once suitable parents have been selected there are many other practical aspects that should be considered to ensure the success of the programme. One important factor is the establishment of a healthy dietary regime. Our investigation have shown that the growth of this species is very much influenced by the diet. As shown only those fed on a balanced meal will show healthy growth. Thus complete diet information is invaluable in the maintenance and breeding of this species.

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